

DATA COLLECTION AND EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS)

SECTION

6

MANAGEMENT CAPACITY



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Chapter 34

DATA COLLECTION AND EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS)



MAIN OBJECTIVES

To provide a timely and informed basis for planning and management of education services.

To establish a set of relevant indicators for data collection and utilization.

To establish or contribute to a national system for collection, processing and utilization of education data.

CONTEXT AND CHALLENGES

Data collection

Educational authorities routinely collect information on schools as part of their regular operations. Such data include location of schools, condition of school facilities, number of grades offered, numbers of students by sex and age, numbers of repeaters, number of teachers by sex and qualification. More sophisticated systems collect data on retention and completion rates, measures of achievement, and the number of children out of school; and examine statistics in terms of gender, ethnicity and income. Educational management information systems (EMIS) are designed to collect and analyze data on the educational system to improve planning, resource allocation, monitoring, policy formation and decision-making.

Emergency situations call for special and timely information on:

The number and location of displaced or otherwise emergency-affected school-aged children and whether they are with their families or have become separated.

The availability and conditions of school facilities.

The availability of teachers.

The availability of learning materials.

Security.

Initially, anecdotal information may be all that is available. More systematic methods of data collection should be initiated as soon as possible, using available personnel and simple forms designed to collect information on the five dimensions noted above. (See the sample assessment form found in the Tools and resources section of the *Guidebook, Chapter 28, Assessment of needs and resources.*)

In civil conflicts, access to populations and data may be difficult, due to insecurity. Trust is difficult to establish with parties in conflict. Information can be misused in the wrong hands. Nevertheless, longer-term information needs must be addressed, despite the continuation of emergency conditions. In addition, information is needed for immediate response, even if technical issues are likely to be paramount. Reliable information may be difficult to obtain, particularly if the population is threatened by civil strife.

For refugee populations, UNHCR and other organizations working with refugees are likely to have data or the means of collecting data. Although it is frequently omitted, data that is available on refugees should be included in the education statistics of the country of asylum. If practicable, the sharing of educational data between countries of origin and asylum can be useful. Likewise, data on IDPs should be included in national statistics (but rarely is). Efforts need to be made to track IDPs.

Regularly updated data on returnee arrivals are needed for reintegration planning (numbers of students, teachers, their respective levels of education and qualifications, and so forth). Educational authorities should seek, obtain and share data concerning their nationals who are refugees in another country.

Where there has been widespread disruption of education systems, it will be necessary to start with collection and analysis of basic statistics, and to elaborate a more sophisticated EMIS when resources (computers, software, skilled personnel) are in place, and field staff have been trained in data collection.

Although data and statistics are notoriously difficult to collect and use in emergencies, the effort must be made to underpin sound planning and management (Bethke and Braunschweig, 2004: 3-5).

Education management information systems (EMIS)

Where possible, emergency data and an existing EMIS should be co-ordinated, so that the Ministry of Education's regular EMIS is informed by data on those affected by conflict, and so that emergency data needs are systematized. When new data collection systems are developed, they should be structured to meet both immediate needs and the long-term reconstruction and development of the education system.

The development of an effective EMIS is a complex and expensive undertaking under the best of circumstances. During emergencies, it is even more challenging because multiple organizations are generally involved in the provision of education, making it difficult to establish common data requirements and to co-ordinate data collection from the various organizations. In designing EMIS, therefore, it is important to consider the needs of all the groups that will rely on the information, including central ministry planners, officials of other national ministries (for example, finance), regional and district education officials, donors, and NGOs. Ultimately, for EMIS to be effective as a planning and management tool, national needs, not donor requirements, must be the primary force behind the development of the system. Despite the difficulties associated with the development of an EMIS, emergencies may provide an opportunity for establishing a better functioning EMIS than was in place before the crisis.

This example demonstrates how educational authorities in Kosovo sought to follow the different stages required when creating an education information management system. These stages are further described below.



EDUCATION INFORMATION MANAGEMENT IN POST-CONFLICT KOSOVO

UNMIK (United Nations Interim Administration in Kosovo) started from a position of almost complete powerlessness in education because it lacked even basic data on how many schools, teachers, students, etc., there were. In 1999, the officials in the former parallel system had a considerable body of information on that system as it was in 1998, but its data did not cover developments since the conflict. Similarly, the Serb-controlled provincial administration had detailed information on schools, teachers, facilities, etc., in the official system in 1989, but the massive exodus and population displacement made these data of questionable value. National and international NGOs and organizations that had been active in Kosovo during the previous decade also had their own sets of statistics, and UNICEF with its mandate to lead the back-to-school campaign quickly set about managing a huge assessment exercise involving site visits to every school, and assessment of their condition and capacity. A key source of statistical information for the parallel system was the company that had managed acquisition, printing and distribution of textbooks, although, again, its data were out of date, and did not reflect the population displacement and movement during and following the conflict.

UNMIK recognized during the back-to-school period that the establishment of a reliable and accurate education management information system would be a key to establishing coherent management required by a modern, decentralized education system. The project was designed with the assistance of an international consultant and, as of the time of writing, had just begun to provide data tables, but not in a form that could be widely distributed through the system for management purposes. A frustrated MEST (Ministry of Education, Science and Technology) official complained that getting data from the EMIS group was like “getting blood out of a stone” but the EMIS team responded that the database was only preliminary and that data had not been checked for final release.

On the basis of the framework drafted by the consultant, the first version of the system was developed in the World Bank supported Project Co-ordination Office within the DES/DEST/MEST [Department of Education and Science, Department and Ministry of Education, Science and Technology]. In this early phase the greatest contact that education officials had with the EMIS was the requirement to provide data to be input to the system. It is thus some time before the system is able to produce output data that is seen by the same officials (if they are the same officials) as useful for planning and administration.

A second problem was that the technical demands of getting a computerized system to operate reliably, and in a way that is simple and friendly enough for managers to be able to employ, require sustained employment of local computer programming specialists. Such people usually have limited experience with education management data and are very hard to retain in employment on local salaries. While these technical and administrative problems are being ironed out, it is not uncommon for the EMIS system, around which there is often considerable publicity and high expectations, to be perceived as a ‘black hole’ into which huge amounts of data are ‘poured in’ but little is seen to come out.

The next challenge is to compile the database into a format that is useful for managers and cannot be corrupted, and to incorporate the usage of the EMIS system into the management training and development programme to be run by the MEST. At the time of publication, The World Bank had plans to support the finalization and implementation of this initiative as part of its second education project, currently under discussion. A full assessment of this initiative can only be made when it has reached the stage where reliable and useful data are regularly made available to planners, managers and the wider public.

Source: Sommers and Buckland (2004: 103-105).

STAGES INVOLVED IN INFORMATION PROCESSING:

1. Identification of information needs

How can the system's educational objectives be met and what is the current situation in relation to these goals?

Establish indicators to measure progress made towards educational objectives. (See the 'Tools and resources' section for a list of 'Education for All' (EFA) indicators.

What are the current difficulties within the education system?

2. Inventory of available sources and data

Which department or institution maintains current data?

How is this data presented?

3. Data collection

What technique will be used to collect necessary information?

School censuses: Often consist of questionnaires answered by principals to collect information annually on schools, students, and teachers.

Statistical surveys: These aim to obtain more in-depth knowledge of a particular aspect of the system.

Sampling surveys: Particularly useful for assessing knowledge acquired by pupils, or for learning about the expectations of parents or teachers.

Administrative and managerial documents: May contain budget information, minutes from ministerial meetings.

Management databases: Contain information on staff hiring and payment.

External information: Includes information about the population and the job market, information coming from sources other than the Ministry of Education.

4. Database construction

What structure will the database have? Depending on the complexity of the question, the database may be either a simple file or a relational database.

Which classification scheme will be used? Do classification schemes of educational levels and teachers' status reflect the current system?

How will administrative units be identified? It is important that the codes used to identify educational institutions be the same for all databases.

Who will enter the data?

5. Data processing

How will the data be presented?

Statistical tables?

Figures?

Maps?

Analytical texts?

6. Publication and dissemination

How will processed data be distributed?

Written publications.

Written memoranda.

Web site.

CD-rom.

Source: Adapted from da Graa *et al.* (2005: 15-24).

SUGGESTED STRATEGIES



Summary of suggested strategies

Data collection and Education Management Information Systems (EMIS)

1. **Ensure the collection and analysis of emergency educational data, as possible.**
2. **If not in place, establish a data collection unit for the emergency within the education authority to co-ordinate data collection at all levels.**
3. **Assess the status of EMIS nationally and for the emergency-affected areas. Consider any needed improvements and seek assistance as appropriate to strengthen national capacity in this area.**
4. **Conduct data analysis to produce indicators to guide policy makers and provide recommendations for practitioners to improve the quality of educational provision.**
5. **Educational authorities should seek, obtain and share statistical data concerning nationals who are refugees in another country.**

Guidance notes

1. Ensure the collection and analysis of emergency data, as possible.

Review the plans for and implementation of ongoing data collection.

What relevant indicators for rapid data collection have been agreed upon with refugees, IDPs and non-migrant populations affected by the emergency?

What demographic and education data can be collected from the affected populations?

What data can be collected from functioning education programmes?

Are the indicators disaggregated by age, gender, disability, educational level and grade, location, language, medium of instruction, etc.? (Collection of data on students by age may be impracticable due to lack of birth certificates, etc., as well as the constraints imposed by emergency conditions. Sample or anecdotal data can indicate the proportion of over-age students in need of, or participating in, schooling due to earlier disruptions of the education system.)



THE IMPORTANCE OF PROTECTING INSTITUTIONAL DATA IN AN EMERGENCY

“In October 1998, Hurricane Mitch left hundreds of thousands of people in Honduras without homes, and destroyed schools, day care centres and entire villages. Approximately 25 per cent of schools were destroyed. Over 250,000 children at primary level and 30,000 at secondary level had their studies drastically interrupted until March 1999 . . . In addition, the central offices of the Ministry of Education, located in Comayagua, were severely damaged. More importantly, the bulk of the education archives were lost and with it the institutional memory of the Ministry. It will take several decades to reconstruct the educational sector in Honduras.”

Source: UNICEF (1999) cited in Sinclair (2002: 85-86).

How will the data be collected or estimated?

- Have existing forms been adapted? (See the Tools and resources section in the *Guidebook, Chapter 28, Assessment of needs and resources* for an example of an emergency assessment form.)
- Have local education personnel been trained to collect data using relatively simple forms? Is a system in place to collect such data?
- Have other personnel travelling to affected areas (for example, other relief personnel, security forces, etc.) been asked and enabled to collect emergency data?

Are the data that are collected on refugees and IDPs included in national reporting formats and EFA monitoring statistics? If they are not currently incorporated, is there a plan to incorporate them? (See the Tools and resources section for a list of EFA indicators.)

- Data collection and analysis on IDPs and refugees is essential if authorities are to maintain control of the process and be part of the management of emergency assistance.
- Information regarding people who have been or may be affected by emergencies should be collected on a regular basis.

At least on an interim basis, until a thorough review can be conducted, use any existing EMIS and link data collection and analysis activities to those being conducted in other sectors, particularly health and social services/affairs.

2. If not in place, establish a data collection unit for the emergency within the education authority to co-ordinate data collection at all levels.

(See also the *Guidebook, Chapter 28, Assessment of needs and resources*.)

Have competent personnel been identified to staff the unit?

Have sustainable, cost-effective mechanisms been developed to collect data at central, regional and local levels?

Have sufficient resources been provided to fund data collection, storage, analysis and reporting? Do levels of funding and infrastructure permit computerization and/or Internet access?

If a Data Collection Unit already exists, have gaps and needs resulting from the emergency been identified, particularly in terms of personnel and resources?

3. Assess the status of EMIS nationally and for the emergency-affected areas. Consider any needed improvements and seek assistance as appropriate to strengthen national capacity in this area.

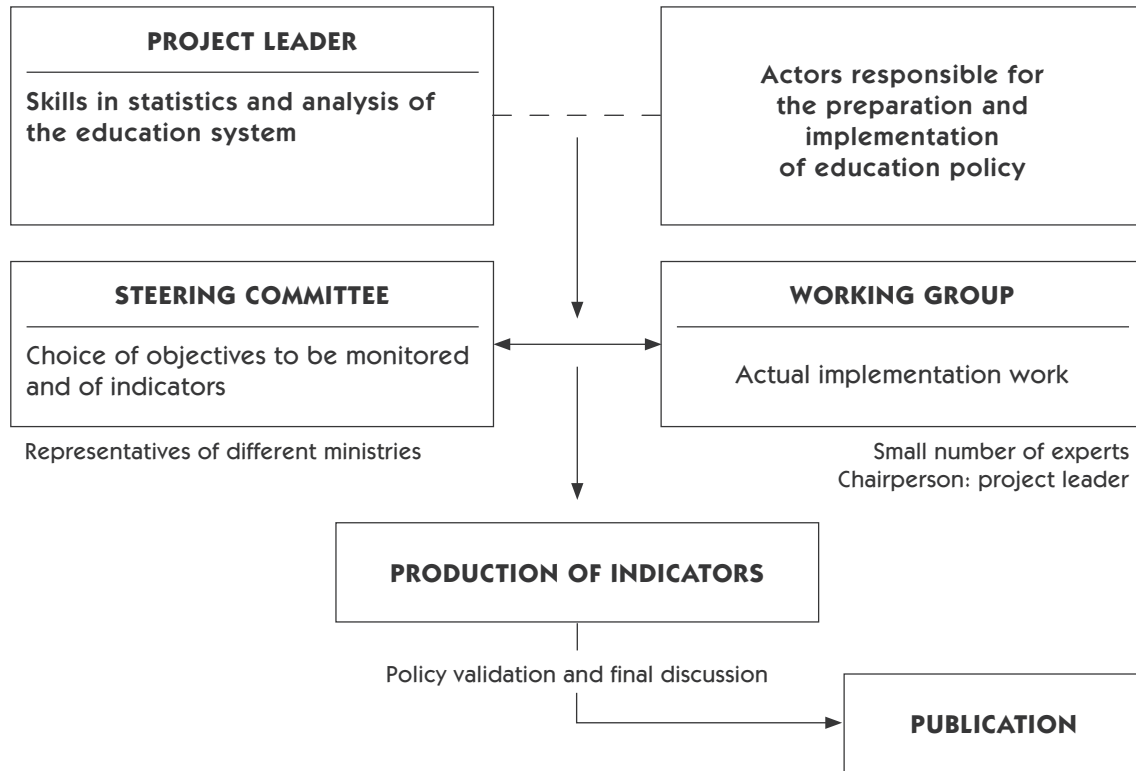
Assess the state of existing EMIS.

What Education Management Information Systems, however informal, currently exist?

- How functional were the EMIS before the emergency?
- How functional are they now?
- To what extent are they:
 - . Computerized?
 - . On paper?
 - . Informal?

Have existing EMIS practices – such as data collection mechanisms, forms, procedures, indicators and statistics as well as utilization processes – been reviewed?

- Has a team or structure been established to review data collection instruments?



Source: Sauvageot (1997: 29-30).

- Have data collection forms used in the acute phase been updated for use in later phases?
- What were the problems with earlier instruments?
- How can these be addressed effectively?
- Do educational authorities or other agencies collect educational data for refugee and IDP children and adolescents?
- Are these data included in national statistics?
- If not, is it possible to obtain the necessary data to include in the national statistical record?

Is EMIS linked with data from other sectors, such as health, social affairs, labour, planning, and finance?

What indicators are used at the national, regional, district and local school levels?

What gaps are there in the current EMIS? For example,

- Are reports and data analysis prepared on a timely basis?
- Are the data relevant? That is, do they provide the necessary information to assist with educational planning and management priorities?
- Are additional types of information necessary?
- Are data or processes duplicated at different levels of the system?
- Are data collection and analysis processes efficient?
- Who analyzes the data?

What are the donors' data requirements?

- Can the existing systems handle those requirements?
- What additional data must be collected to satisfy the donors?
- Can ministry officials negotiate with donors on equal terms?

How is existing data utilized by the system?

- Who has used the data?
- Do data only flow from the local level up to the central level, or are data fed back to the service providers at the local level?
- How can the data that are collected be used to help educational authorities improve educational services?

How well co-ordinated are the various data collection and utilization efforts within the system?

When was the EMIS last reviewed?

Assess EMIS need.

What new data needs have emerged as a result of the emergency?

If a new EMIS is being considered, have EMIS in other countries in similar circumstances been reviewed to compare relevance and applicability to the current situation?

- Can an existing system from another country be adapted according to the needs of this emergency?
- What data are needed, by whom, and when? For what purposes will the data be utilized (e.g. budgeting, analyzing trends in repetition or survival rates, etc.)? In planning EMIS, it is important to consider how the system will be utilized, and the demand for as well as supply of data. Often, EMIS data are extremely under-utilized, particularly in the early years after a new, reformed system has been introduced.
- What practices are possible in the emergency context?
- What procedures would lay the groundwork for a more permanent system?

Have the various stakeholders been asked about their data needs?

- Based on the identified needs, are there gaps in the data currently being collected?
- What are the similarities in their needs? How can data be collected efficiently in order to respond to the needs of the various stakeholders without duplicating data collection efforts?

(De)centralize data collection and EMIS appropriately.

How are the regional and district/local authorities involved in data collection, processing and analysis?

- How can they be involved more substantively?
- Do regional and district authorities share data and findings on a regular basis?

What monitoring mechanisms are in place to ensure that agents responsible for data collection, processing and analysis use the same methodologies at all levels?

- EMIS must include ways to validate and check data and must anticipate negative unintended consequences such as the temptation to inflate enrolment figures when funds are allocated according to enrolment statistics.

Have plans been implemented for locating different aspects of data collection at appropriate levels of the system?

Has training for data collection at the different levels been conducted? If not, will training be provided? Who will conduct it, and who will be the principal beneficiaries?

What resources are available and necessary to ensure effective restructuring of data collection and EMIS, for example, computer and other information technology facilities, personnel and storage facilities?

Seek funding for computer hardware and software to secure the most effective EMIS system.

What software and hardware – computers, EMIS software programmes, typewriters, hand-held radios, telephone communications, transport for data collection etc. – do provincial authorities currently have?

What software and hardware do they need in order to meet the needs for data collection and analysis?

Have budgets been prepared that reflect the need for software and hardware, including training on how to implement a new/revised EMIS.

Have possible funding sources been approached?

Is it desirable and feasible to provide computer services to all groups involved in educational data management as part of the development of EMIS (refugees, returnees, national populations)? If not, where does priority lie for provision of computer and internet services for data collection with which groups, and at which level?

Are there any existing internet linkages that can be capitalized upon?

Is there a telephone network that could be used to establish an email connection?

What innovative strategies might be used to establish an internet or email network that is cost effective and sustainable?

4. Conduct data analysis to produce indicators to guide policy makers and provide recommendations for practitioners to improve the quality of educational provision.

Are summary reports (including summaries of analyses and recommendations) clear, practical, and from the perspective of practitioners user friendly?

Have summary reports been translated into languages that are appropriate for practitioners?

Have summary reports been made widely available to stakeholders, in print form, and on the internet when possible?

Have summary reports been provided and cross-referenced to relevant groups, including other sectors, such as health and social services/affairs, security, water/sanitation, etc.?

5. Educational authorities should seek, obtain, and share statistical data concerning nationals who are refugees in another country.

Have cross-border negotiations/tripartite agreements on education been established between the United Nations and national authorities?

What issues have been addressed as a result of these negotiations?

- Criteria for certification and recognition of educational achievements?
- Criteria for recognition of teacher training and teacher qualifications?
- Criteria for taking and passing national examinations?
- Criteria for the printing and supply of sufficient textbooks from the country of origin, or permission for United Nations agencies or the country of asylum to print textbooks, etc.?

What steps have been taken to facilitate information sharing regarding the educational status of and systems for displaced populations?

- In the case of prospective returnees, for example, have educational authorities requested education data (such as the number of learners/teachers, their area of origin, age, gender and grade/level, etc.) from the host countries/areas?

TOOLS AND RESOURCES

1. EFA indicators

| CATEGORY | INDICATORS |
|--|--|
| ADULT LITERACY | Adult literacy rates (total, male, female) Number of illiterates, 15+ (total, male, female) Adult literacy rate (total, male, female) |
| YOUTH LITERACY | Youth literacy rate (total, male, female) Youth literacy numbers (total, male, female) |
| EARLY CHILDHOOD CARE AND EDUCATION (ECCE) | Gross enrolment ratio in early childhood care and education (total, male, female, female/male) Percentage of new entrants to primary education with ECCE experience (total, male, female) |
| PRIMARY EDUCATION | Gross intake rate in primary education (total, male, female, female/male) Net intake rate in primary education (total, male, female, female/male) School life expectancy (total, male, female, female/male) Primary age group Primary school age population (total, male, female, female/male) Gross enrolment ratio in primary education (total, male, female, female/male) Net enrolment ratio (total, male, female, female/male) Percentage overage (total, male, female) Percentage underage (total, male, female) |
| SECONDARY EDUCATION | Secondary age group Secondary school age population (total, male, female, female/male) Secondary net enrolment ratio (total, male, female, female/male) |
| HUMAN RESOURCES | Percentage trained teachers, pre-primary education (total, female) Pupil-teacher ratio, pre-primary education Percentage female teachers, pre-primary education Percentage trained teachers, primary education (total, female) Pupil-teacher ratio, primary education Percentage female teachers, primary education Percentage trained teachers, lower secondary education (total, female) Pupil-teacher ratio, lower secondary education Percentage female teachers, lower secondary education |
| INTERNAL EFFICIENCY | Repetition rates, grades 1, 2, 3, 4, 5, 6 (total, male, female) Survival rates at grade 4, 5 (total, male, female, female/male) Transition to secondary (total, male, female, female/male) |
| FINANCE | Public current expenditure on primary education as percentage of GNP Public current expenditure per pupil on primary education as percentage of GNP Public current expenditure on primary education as percentage of current expenditure on education Total public expenditure as percentage of GNP Total public expenditure on education as percentage of total government expenditure Public current expenditure on education as percentage of total expenditure on education |
| PRIVATE ENROLMENT | Private enrolment as percentage of total enrolment, pre-primary education Private enrolment as percentage of total enrolment, primary education Private enrolment as percentage of total enrolment, secondary general education |
| OUT-OF-SCHOOL CHILDREN | Estimated out-of-school children (total, male, female, female/male) |

Source: UNESCO (2002).

2. INEE good practice guide for emergency education: assessment, monitoring and evaluation

The following table contains possible indicators to be used when assessing, monitoring and evaluating education programmes in emergencies or crisis situations.

| | MONITORED ITEMS | POSSIBLE TRENDS AND ACTION |
|-----------------------|--|--|
| STUDENTS | <p>Student registration disaggregated by gender, disability, age, ethnicity, grade</p> <p>Student attendance disaggregated by gender, and ethnicity</p> <p>Students who drop out</p> <p>Student pass rates and matriculation</p> | <p>Changes in student registration and attendance can assist in identifying barriers to students such as community attitudes towards the education of girls, difficulty paying school fees and discrimination.</p> <p>Following student pass rates be used as an indicator of quality of education, as well as monitoring the progress of special groups such as girls and minorities.</p> |
| TEACHERS | <p>Teachers at the school disaggregated by gender, ethnicity, grades taught, education level</p> <p>Teacher attendance records</p> | <p>Tracking the teachers and grades combined with student data can lead to more effective assignments of teachers.</p> <p>Monitoring the gender and ethnicity of teachers can lead to more equitable hiring and assignment practices.</p> <p>Tracking attendance identifies teachers who are delinquent in their duties.</p> |
| ADMINISTRATION | <p>Administrative staff broken down by gender, age, ethnicity</p> | <p>Monitoring the gender and ethnicity of teachers can lead to more equitable hiring and assignment practices.</p> |

Source: INEE (2002).

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CHAPTER **34**



SECTION 6



United Nations
Educational, Scientific and
Cultural Organization



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