MEDA-ETE
regional project

Methodological Notes




Euromed Observatory Function Guidelines for developing indicators on technical and vocational education and training

EDUCATION AND TRAINING FOR EMPLOYMENT (ETE) IS AN EU FUNDED INITIATIVE IMPLEMENTED BY THE EUROPEAN TRAINING FOUNDATION (ETF). ITS OBJECTIVE IS TO SUPPORT THE MEDA PARTNERS IN THE DESIGN AND IMPLEMENTATION OF RELEVANT TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) POLICIES THAT CAN CONTRIBUTE TO THE PROMOTION OF EMPLOYMENT THROUGH A REGIONAL APPROACH.

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Euromed Observatory Function Guidelines for developing indicators on technical and vocational education and training

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2007

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PURPOSE OF THE METHODOLOGICAL NOTE

This methodological note offers guidelines for developing indicators used to assist with decision-making when implementing education and vocational training policies linked to labour market requirements.

It begins with the difficulties relating to indicator development and then presents the various initiatives under way at international level in the field concerned, together with the most recent developments.

It indicates the obstacles encountered when collecting information and explains how to overcome them, while systematically focusing on quality aspects.

It presents avenues for developing indicators relating to the following priorities, identified by the donors and the countries themselves as strategic for supporting reforms in the Mediterranean region:

- managing training systems, including decentralisation/autonomy of technical education and vocational training establishments/centres, involving social partners at all levels of the technical education and vocational training system;
- social cohesion and access to the technical education and vocational training system;
- financing training;
- technical education, vocational training and lifelong learning;
- developing skills for the informal sector.

A standard document is proposed for calculating an indicator. This model, to be discussed with the monitoring team and Mediterranean partners (MEDA) experts, will then be systematically used for all methodological notes.

The note ends with a bibliography.

Indicators: a vital tool for directing and evaluating education systems in general, and education and initial and continuing vocational training in particular.

1. INTRODUCTION

In most countries education and training systems are vast organisations that are very complex to manage. Given the general trend to reduce public expenditure and resources, the significant budget allocated to education is being called into question and recipients have to show that the money is being used wisely, that the results are good and comply with set objectives and that evaluations are regularly conducted to ensure that the system is operating correctly. However, education and training continues to account for a major share of state expenditure. It therefore makes sense to introduce greater transparency into the way in which this money is spent, to regularly evaluate this spending and to set up an efficient directing system.

The quality of education is also a disturbing issue in many countries. Again, a directing and evaluation system is required.

As far as vocational education and training are concerned, the aim of meeting labour market requirements, the problems of employment for people leaving the system and the need to improve employability in a context of rapid technical change, have all resulted in the efficiency of training, its development and achievements, receiving more attention. Unlike general education, evaluation of this form of training has to incorporate an external feature: the way in which the various diplomas and specialised training schemes are incorporated into working life.

Access to objective information when directing and planning the education and training system in whole or in part is therefore seen as a requirement by decision-makers, whether public or private, and also more generally by members of the education and training community. These data also enhance public debate and improve its quality.

Until recently, although the majority of countries and international organisations had education databases, these data were seldom used by decision-makers as they were presented in such a way that non-specialists found them difficult to use. The raw data had to be transformed into usable information, thus directing and evaluating indicators are being drawn up.

Ideally, a set of indicators should cover the various ways in which an education system or subset (e.g. vocational education) works, and the resulting data should be accessible to non-specialists in statistics and quantitative analysis. Reading and interpreting the most recent data should therefore be easy.

To meet this type of requirement, several projects were set up at the end of the 1980s, the first under the aegis of UNESCO and others directed by the OECD, which considerably developed this field. These projects led to a number of publications, all focusing on indicators.

At the same time, several countries also drew up directing and evaluating indicators for the education system. In general, ministries of education oversaw this work. The first

of these were *The State of Education* in France and *Education Indicators* in Quebec. More recently, similar documents have been published in Denmark and Finland, for example, and on a less regular basis in Algeria, Indonesia, Morocco, the Netherlands and Senegal.

UNESCO also revived a major programme relating to the monitoring and evaluation of 'Education for All', supported by several quality teams at headquarters in Paris and at regional centres such as Dakar (Senegal).

Recently, the European Union has set itself major strategic objectives, in particular following the Lisbon Summit (March 2000) on education and training, and the Copenhagen Conference (2002) on vocational training.

To ensure that the various systems develop in line with the chosen objectives, sets of indicators on education and training and on the quality of vocational training in particular have been defined and are gradually being implemented.

A project concerning key indicators in vocational education and training has also been directed by the European Training Foundation (ETF). This project opened up the debate on indicators and defined several useful structural indicators (see Section 3.4), but it was redirected as it did not entirely live up to expectations.

As regards the MEDA region, various projects concerning the development of 'observatory functions' for employment and training are also under way. The aim is to back the development of local capabilities with a view to setting up information systems for human resources that are able to support decision-making. The networking of skills and the development of indicators are the most significant aspects of these donor-supported initiatives. A project in Jordan is currently the most advanced.

The shared objective of all these projects is to provide the entire community with a small number of relevant indicators that are easy to use and offer a good description of the current state of the education and training system.

However, for the time being, no such coordinated system exists at regional level, and so comparative work based on a shared set of indicators cannot yet be considered.

2. GENERAL INFORMATION ON INDICATORS AND EDUCATIONAL OBJECTIVES

To successfully complete a project based on indicators, the first requirement is to understand what an indicator is. The objectives to be measured must then be clearly identified, as indicators have no value on their own. They are only relevant if they measure an objective. This objective identification is therefore very important and constitutes the first stage of the project.

2.1 What is an indicator?

An indicator is a synthetic information item used to measure, evaluate and direct. It always refers to an objective.

A set of indicators is a tool that should make it possible to comprehend the current state of a system (in this case the education system or vocational training), and to report on it to all those concerned in the public and private sphere, in other words the whole country.

This highlights a source of confusion that must be avoided: an indicator is not basic information. It is a corpus of information that has been elaborated so that a phenomenon can be studied. It follows that a list of indicators must not be confused with a list of tables that has been produced for a statistical yearbook, or to meet administrative needs. The number of pupils entering the vocational second cycle is interesting for a manager as is the number of teachers and pupils, but the first indicator will be the percentage of a cohort entering the vocational second cycle, and the second the number of pupils per teacher. The difference is clear, as is the difference in analytical potential.

It is often tempting to add raw data to indicators, but it is important to avoid this error, and ensure that this kind of work retains its own character.

It is possible, as various publications have stated, to set out the characteristics of a good indicator:

- relevance;
- ability to summarise information without distorting it;
- coordinated and structured character, which allows it to be linked to other indicators for a global analysis of the system;
- accuracy and comparability;
- reliability.

It must enable to:

- measure distance in relation to an objective;
- identify problematic or unacceptable situations;
- respond to the concerns of politicians, and to the questioning that has resulted in it being chosen;
- compare its own value with a reference value, a norm, itself calculated for another period of observation.

A system of indicators must function like an instrument panel, facilitating the identification of problems and measuring their substance. Detailed diagnosis and the search for solutions will take place through complementary analysis and research. At this point, it is possible to evoke the (classic, but appropriate) picture of an indicator warning that an engine is about to overheat. When it lights up, the specialist must find out why, and find solutions to deal with the problem.

In short, indicators play a fundamental role in directing and evaluating an education system in general and vocational training in particular.

2.2 What needs to be measured?

To build a good indicator, it is necessary to identify the most important phenomena to be measured, and these will depend on the choices that countries make in response to their respective education and training policies. The relevance of other indicators is more universal, as well as more descriptive, but their importance will depend on the context. The enrolment rate in primary education is a good indicator, but if all children go to school in a given country, enrolment loses much of its importance. We therefore need to analyse the situation and the specific projects of the country being examined.

These indicators must also contain a descriptive overview of the education system, something simple and precise that provides an analysis of the various phenomena with points of comparison. Furthermore, certain aspects of an education system can only be observed over time, and it is therefore necessary to present the development of data over several years. Lastly, geographical or socio-demographic (e.g. gender or social category) diversities and disparities, which may be substantial, should be acknowledged.

In addition to the descriptive aspects, indicators must provide elements for analysing education and training policy. However, when using a group of indicators, it must be possible to find avenues for understanding and explaining causal relations in the functioning of the education system. This is exactly what transparency offers.

These are unquestionably delicate interpretations, and for this reason it is important for the group of chosen indicators to accommodate several viewpoints. This is hard work, but it is the only way that political decision-makers can be given the managerial tools, and society in general the elements with which to understand.

2.3 Identifying the objectives of education and training policy

This is a key phase. Indeed, to correctly evaluate an education and training policy or plan, it is vital to explain the desired objectives clearly. They may be:

- qualitative, for example: improving the quality of vocational training, aiming for more equality, effectiveness or efficiency in the education system or developing school/business relations;
- quantitative, for example: 40 % rate of access to vocational education diplomas, 5 % repetition rate for apprenticeship training schemes, achieving a pupil/teacher ratio of 45, dedicating 3 % of GDP to research or reducing the number of students leaving the education system early by 20 %.

This task is never easy as many education policies and plans do not set out their objectives precisely. They therefore have to be extracted from education policy statements and official texts, and the objectives thus redefined then have to be validated by the people responsible for the policies or plans.

2.4 Some concrete examples of objectives

It is interesting to study the objectives set in 2000 as part of UNESCO's 'Education for All' programme; the European Union's objectives relating to Lisbon; the Copenhagen process; and the objectives defined within the context of Jordan's employment and training 'observatory function' project. They illustrate an exemplary approach whose initial stage requires well-identified objectives before the indicators are drawn up.

2.4.1 Education for All

With the approval of Member States, leading United Nations international agencies (UNESCO, UNICEF, UNDP and UNFPA) and the World Bank first set ambitious objectives for all countries for the year 2000 at a conference held in Jomtien (Thailand) in 1990. Many countries were unable to achieve these objectives and therefore, during the Dakar World Education Forum in 2000, the same bodies defined new objectives for 2015, which were again accepted by all Member States.

The following **six objectives** were adopted in Dakar:

1. Expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children.
2. Ensuring that 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.
3. Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programmes.
4. 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.
5. Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality.

6. Improving all aspects of the quality of education and ensuring excellence of all so that recognised and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

Although the objectives are very similar to those defined in Jomtien, the Framework for Action adopted in Dakar stresses other aspects of education, such as the elimination of disparities between girls and boys in education (in primary education, in access to secondary education and non-formal education); these require the development of indicators that complement those defined to meet the Jomtien objectives, to enable progress to be monitored and evaluated.

2.4.2 European Union objectives for education and training

During the 2000 Lisbon Summit, the European Union defined a very ambitious major objective: 'To become the most competitive and most dynamic knowledge-based economy in the world, capable of sustainable economic growth accompanied by quantitative and qualitative improvement of employment and greater social cohesion.'

Education and training constitute a vital priority field for achieving this objective. **Three strategic objectives** were defined:

1. Improving the quality and effectiveness of education and training systems in the EU.
2. Facilitating the access of all to education and training systems.
3. Opening up education and training systems to the world.

To make it easier to monitor the developments of the different factors linked to these major strategic objectives, the EU has broken them down into **13 sub-objectives**, as follows:

Strategic objective 1

Increasing the quality and effectiveness of education and training systems in the EU, in light of new demands from the knowledge-based society and the development of education and learning plans.

- *Objective 1.1:* improving education and training for teachers and trainers
- *Objective 1.2:* developing skills for the knowledge society
- *Objective 1.3:* ensuring access to ICT for everyone
- *Objective 1.4:* increasing recruitment to scientific and technical studies
- *Objective 1.5:* making the best use of resources

Strategic objective 2

Facilitating the access of all to education and training systems, in light of the guiding principle of lifelong education and training, promoting employment and career development, and active citizenship, equal opportunities and social cohesion.

- *Objective 2.1:* open learning environment
- *Objective 2.2:* making learning attractive
- *Objective 2.3:* supporting active citizenship, equal opportunities and social cohesion

Strategic objective 3

Opening up education and training systems to the world, in light of the fundamental need to adapt to vocational requirements and the demands of society and to accept challenges linked to globalisation.

- Objective 3.1: strengthening links with working life and research and society at large
- *Objective 3.2:* developing the spirit of enterprise
- *Objective 3.3:* improving foreign language learning
- *Objective 3.4:* increasing mobility and exchanges
- *Objective 3.5:* strengthening European cooperation

Key points have been defined that must be covered to achieve each strategic objective. For example, for Objective 1.1, 'improving education and training for teachers and trainers', the following key points have been identified and must be covered by all Member States:

- Determining the skills that teachers and trainers must have, based on the development of their role in the knowledge-based society.
- Creating the conditions required for teachers and trainers to receive adequate support for accepting the challenges of the knowledge-based society, including through initial and continuing training in the context of lifelong education and training.
- Ensuring that the teaching profession attracts enough candidates in all disciplines and at all levels, and providing for the needs of the profession in the long term by promoting its attractiveness.
- Attracting new candidates to teaching and training who have already acquired vocational experience in other fields.

Naturally, indicators figure among the instruments designed to encourage and monitor progress. They are combined with more qualitative tools to examine fields likely to be the subject of experience and good practice exchanges. Several reference criteria are also given to facilitate understanding of each objective and the different items that it comprises.

2.4.3 The quality objective in vocational education and training

Defined more precisely following the Copenhagen process, the quality objective mainly involves developing mutual trust between member countries and enabling greater transparency between the forms of certification awarded in each country. It also focuses on improving vocational education and training and results.

2.4.4 Strategic objectives in Jordan

The development of an 'observatory function' in Jordan is supported by the ETF. Objectives have been defined and validated by a steering group comprising all the establishments responsible for education and vocational training at both secondary and higher education levels. These are the fruit of large-scale work, marked by good collaboration between the different establishments.

Six strategic objectives were defined:

1. Developing links between students leaving the education system and economic and social development requirements.
2. Continuing the development of infrastructures for general and vocational education.
3. Developing the qualitative aspects and dimensions of general and vocational education.
4. Improving the efficiency and effectiveness of the education system, paying particular attention to the education economy, including the 'input-output' and processes aspects.
5. Promoting the democracy of education and its role in social mobility.
6. Providing each individual with the opportunity to enrol on, and successfully complete, a training course to the best of his or her abilities, motivation and desires.

These are complemented by the following **five major operational objectives**:

1. Preparing Jordanians for working life either as employees or self-employed workers.
2. Improving horizontal and vertical mobility in the labour market.
3. Obtaining equitable results in technical and vocational education and training (TVET).
4. Rationalising investments in training.
5. Maximising the value of public expenditure in TVET.

The four examples above clearly show the diversity of the objectives defined by different establishments or countries. Their differences must be taken into account when building indicators.

The second phase, which is equally complex, involves transferring the identified objectives to the indicators, which will be used to monitor and evaluate the action taken to achieve them.

3. FROM OBJECTIVES TO INDICATORS

As soon as an initial list of objectives has been drawn up, a series of indicators must be associated with each objective. An indicator can, of course, be used with several objectives.

For each example of objectives identified above, the indicators defined in these projects are presented.

3.1 Education for All

To evaluate and monitor the objectives drawn up in Jomtien in 1990, the five organisations that organised the conference defined 18 indicators. It is regrettable that they did not do so until 1996, following a fairly disastrous conference intended as a mid-term review, but which, in the absence of reliable indicators, was unable to evaluate anything. These **18 indicators** were used to evaluate Dakar follow-up. Additional indicators are currently being validated.

Objective 1: Early childhood

- *Indicator 1:* Gross enrolment rate in early childhood development programmes, including public, private and community programmes, expressed as a percentage of the official age group concerned, if any, otherwise the age group 3 to 5.
- *Indicator 2:* Percentage of new entrants to the first year of primary education who attended some form of organised early childhood development programme.

Objectives 2 and 5: Universal primary education, gender equality

- *Indicator 3:* Gross intake rate: new entrants to the first year of primary education as a percentage of the population of official entry age.
- *Indicator 4:* Net intake rate: new entrants to the first year of primary education who are of the official primary school/entrance age as a percentage of the corresponding population.
- *Indicator 5:* Gross enrolment rate.
- *Indicator 6:* Net enrolment rate.
- *Indicator 7:* Public current expenditure on primary education:
  - as a percentage of GNP;
  - per pupil, as a percentage of GNP per capita.
- *Indicator 8:* Public expenditure on primary education as a percentage of total public expenditure on education.
- *Indicator 9:* Percentage of primary school teachers having the required academic qualifications.
- *Indicator 10:* Percentage of primary school teachers who are qualified to teach according to national standards.
- *Indicator 11:* Pupil-teacher ratio.

- *Indicator 12:* Repetition rate by years of study.
- *Indicator 13:* Survival rate to year 5 (percentage of a pupil cohort actually reaching year 5).
- *Indicator 14:* Coefficient of efficiency (ideal number of pupil years needed for a cohort to complete the primary cycle, expressed as a percentage of the actual number of pupil years).
- *Indicator 15:* Percentage of pupils having reached at least year 4 of primary schooling and who master a set of nationally defined basic learning skills.

Objective 4: Literacy

- *Indicator 16:* Literacy rate of 15- to 24-year-olds.
- *Indicator 17:* Adult literacy rate: percentage of the population aged 15+ that are literate.
- *Indicator 18:* Literacy Gender Parity Index: ratio of female to male literacy rates.

It is noteworthy that no indicator has been defined for Dakar objectives 3 and 6, in the same way that none was defined for two of the Jomtien objectives. Admittedly the task was not easy, but this deficiency will make it difficult to evaluate initiatives for these two objectives.

Additional indicators need to be defined, for which work is under way. They have to take account of the reduction in (ethnic, gender and other) disparities in access to primary education, and ensure that all young people who go to school complete primary education. It is therefore necessary to define a rate of access in the final year of education that can measure this objective. It will have to take account of access for all to the first year of primary education (i.e. this must be universal; the rate of access must be 100 %), and of the disappearance of drop-outs during primary education (school retention must be 100 % up to the final year).

Access to secondary education and continuing education curricula must also be measured to make sure that they are equitable.

Lastly, it is important to measure skills acquired in reading, writing and numeracy, and identify and measure the skills that are essential for everyday life.

To achieve all this, it is vital to improve the information system, not only as far as new objectives are concerned, but also in fields where the 2000 statistical review (UNESCO, 2000) identified serious shortcomings: education financing (the need to take account of non-governmental financing sources and improve the quality of all information); the need to improve demographic statistics, and particularly to regulate the issue of striking differences between the data supplied by countries and that supplied by the United Nations (prompting considerable uncertainty about enrolment rates and the number of out-of-school children).

Here, the same problems that directly concern the New Independent States are encountered: developing rates of access to secondary education and, in particular, vocational education; ending course drop-outs; exploring ways of financing education; improving the quality of demographic data; developing evaluations of pupils' learning achievements and reducing disparities, although gender disparity is less pronounced than in other regions.

3.2 EU indicators for lifelong education and training

Indicators have been defined for each sub-objective of the three major strategic objectives. Note that the list of indicators changed during the project, mainly because of problems in calculating the planned indicator, either because it was difficult or almost impossible to 'measure' what it covers, or because data were unavailable. When data are unavailable, there are two possibilities: either postpone the calculation while waiting for data collection results, or abandon the idea due to prohibitive collection costs. To show this development, the current list appears below, including the indicators initially planned but not chosen in the long term.

In total, **29 indicators** were chosen and have been calculated (or are in the process of being calculated) for all European Union countries. For some of these, quantitative objectives have been defined and accepted by the member countries for 2010 and are mentioned after each of these indicators.

Strategic objective 1

Increasing the quality and effectiveness of education and training systems in the EU, in light of new demands from the knowledge-based society and the development of education and learning plans.

Objective 1.1: Improving education and training for teachers and trainers

- *Indicator 1:* Distribution of teachers by age. This is an approximation of the shortage/surplus of qualified teachers and trainers in the labour market.
- *Indicator 2:* Number of young people under 15 in the total population (replaces development of the number of candidates for training programmes (teachers and trainers)).
- *Indicator 3:* Pupil (or trainee) to teacher (or trainer) ratio (replaces the percentage of teachers and trainers on continuing vocational training courses).

Objective 1.2: Developing skills for the knowledge society

- *Indicator 4:* Percentage of the population aged 22 that completes higher secondary education; *2010 objective: 85 %.*
- Continuing training of teachers in fields that demonstrate a need for skills (abandoned).
- *Indicator 5:* Percentage of pupils at proficiency level 1 or below on the Programme for International Student Assessment (PISA) reading scale; *objective: reduce this percentage by 20 % by 2010.*
- *Indicator 6:* Levels reached in reading/writing (PISA, coordinated by OECD).
- *Indicator 7:* Levels reached in numeracy/mathematics (PISA).
- *Indicator 8:* Levels reached in science (PISA).
- Levels reached for 'learning-to-learn' skills (abandoned).
- *Indicator 9:* Percentage of adults who did not complete higher secondary education but who have been involved in some kind of education or training initiative, by age group.

Objective 1.3: Ensuring access to ICT for everyone

- Percentage of teachers who have been trained to use ICT in schools.
- Percentage of pupils and students using ICT for their studies.
- Percentage of lesson hours in education and training establishments using ICT.

For the moment, these indicators have not been included in the official list due to the shortcomings of the available data. They have been replaced by three other indicators that do not feature in the official list either:

- Computer/pupil ratio.
- Average percentage of computers with internet access.
- Frequency of use of computers by children aged 9.

Objective 1.4: Increasing recruitment to scientific and technical studies
The total number of graduates in mathematics, science and technology must increase by at least 15 % by 2010 with a reduction in gender imbalance

- *Indicator 10:* Increase in the percentage of enrolments in mathematics, science and technology courses (International Standard Classification of Education (ISCED) levels 5A, 5B and 6, by gender) in relation to all enrolments in higher education.
- *Indicator 11:* Increase in the percentage of graduates in mathematics, science and technology courses (ISCED levels 5A, 5B and 6, by gender) in relation to all graduates in higher education.
- *Indicator 12:* Increase in the number of graduates on these courses, by gender.
- Increase in the number of scientists and engineers, by gender (abandoned).
- *Indicator 13:* Number of mathematics, science and technology higher-education graduates per 1 000 inhabitants aged 20–29 (distribution according to ISCED levels 5A, 5B and 6).
- Increase in the number of qualified teachers in mathematics, science and technology fields (secondary level) (abandoned).

Objective 1.5: Making the best use of resources
Increase in the investment in human resources by inhabitant (structural indicator) measured by five indicators

- *Indicator 14:* Proportion of public expenditure on education to GDP.
- *Indicator 15:* Proportion of private expenditure to GDP.
- *Indicator 16:* Company expenditure on continuing vocational training as a percentage of the wage bill.
- *Indicator 17:* Total expenditure by pupil/student according to level of education.
- *Indicator 18:* Total expenditure by pupil/student compared with GDP per capita.

Strategic objective 2

Facilitating the access of all to education and training systems, in light of the guiding principle of lifelong education and training, promoting employment and career development, and active citizenship, equal opportunities and social cohesion.

Objective 2.1: Open learning environment

- *Indicator 19:* Percentage of people aged 25 to 64 involved in education and training initiatives (structural indicator); *objective: at least 12.5 % by 2010*.

Objective 2.2: Making learning attractive

- *Indicator 20:* Number of hours devoted to continuing vocational training for 1 000 working hours for companies with continuing vocational training courses or traineeships per economic activity.
- *Indicator 21:* Number of hours devoted to continuing vocational training for 1 000 working hours for all companies by economic activity.
- *Indicator 22:* Rate of participation by age and level of education.

Objective 2.3: Supporting active citizenship, equal opportunities and social cohesion

- *Indicator 23:* Proportion of people aged between 18 and 24 who did not complete the first cycle of secondary education and who are not continuing their education or training (structural indicator); *objective: no more than 10 % in 2010.*
- In the planning stage: an indicator measuring active citizenship.

Strategic objective 3

Opening-up education and training systems to the world, in light of the fundamental need to adapt to vocational requirements and the demands of society and to accept challenges linked to globalisation.

Objective 3.1: Strengthening links with working life and research and society at large (abandoned)

- Percentage of students and people in training who benefit from organised traineeships (on-the-job education) (abandoned).

Objective 3.2: Developing the spirit of enterprise (abandoned)

- Proportion of self-employed workers in different sectors of the knowledge-based economy (particularly in the age group 25 to 35).
- Percentage of education and training establishments providing advice and guidance in setting up companies.

Objective 3.3: Improving foreign-language learning

The Council and Commission noted that there were still no reliable data on young Europeans' ability to use foreign languages; hence it is necessary to continue defining and applying quality indicators in this field. In the meantime, the following indicators were considered:

- Percentage of pupils and students who reach a certain level of knowledge in two foreign languages, for example level B2 of the Joint European Reference Framework drawn up by the Council of Europe (abandoned).

- Percentage of language teachers who have taken part in initial or continuing training programmes involving direct contact with the country and the culture of the language (abandoned).

In the end, two indicators were chosen:

- *Indicator 24:* Distribution of pupils in the first or second cycle of secondary education who learn a foreign language.
- *Indicator 25:* Average number of foreign languages studied by pupil in the second cycle of secondary education.

Objective 3.4: Increasing mobility and exchanges

- *Indicator 26:* Internal and external mobility of teachers and trainers in the context of Socrates (Erasmus, Comenius, Lingua and Grundtvig) and Leonardo da Vinci programmes.
- *Indicator 27:* Internal and external mobility of students in the context of Socrates and Leonardo da Vinci programmes.
- *Indicator 28:* Percentage of foreign students in higher education (ISCED levels 5 and 6) in relation to all students enrolled in the destination country, by nationality (EU or other countries).
- *Indicator 29:* Percentage of students (ISCED levels 5 and 6) from the country of origin who are enrolled abroad (EU or another country).
- Proportion of students or people in training from a country who carry out part of their studies in another EU country or a third country (abandoned).
- Proportion of teachers, researchers and academics from other EU countries employed at different levels of the education system (abandoned).

Objective 3.5: Strengthening European cooperation

- Proportion of students and academic and postgraduate researchers in another EU country or third country.
- Percentage of graduates who obtain joint degrees in Europe.
- Percentage of students and people in training who are concerned by the European Credit Transfer System (ECTS) or Europass and/or receive a supplement to their degree/certificate.

The following presentation has been chosen for most of the indicators: a four-column table. The first column indicates the current EU country average and the second contains the average of the current three leading EU countries. The last two columns contain the indicator values for the United States and Japan.

The quantitative objective, which is sometimes clearly stated, is to bring the EU average up to the average of the current three leading countries while keeping an eye on performances in the United States and Japan.

Note that this list is supplemented by a longer list of indicators (approximately 120) responsible for monitoring the objectives in even greater detail, but, as mentioned, indicators become irrelevant in too great a number and this long list is seldom used by Member States.

3.3 EU quality indicators for vocational training

Ten indicators have been defined to improve the transparency of qualifications and develop mutual trust between countries:

- *Indicator 1:* Proportion of VET suppliers applying the 'quality management' system, in observance of the joint quality-assurance framework agreement.
- *Indicator 2:* Investment in training educators.
- *Indicator 3:* Rate of unemployment by group (or by level of training).
- *Indicator 4:* Size of vulnerable groups (or groups at risk): students leaving the education system early, unemployed young people (under 25), long-term unemployed (one year and over), seniors (55 years and older), disabled people (according to national definitions).
- *Indicator 5:* Participation rates in initial vocational training and lifelong learning by type of vocational training programme.
- *Indicator 6:* Percentage of participants who have started, and successfully completed, a vocational training scheme (by VET type).
- *Indicator 7:* Destination of trainees six months after training.
- *Indicator 8:* Use of acquired skills-expertise in the workplace, from the employer's and the employee's point of view.
- *Indicator 9:* Ability of existing mechanisms to adapt VET to changes in labour market requirements.
- *Indicator 10:* Ability of existing mechanisms to promote improved access including guidance, advice and support systems.

Some 'structural' indicators are already available but most of them are still being built and are in the information-gathering and/or initial calculation stage. It will be interesting to observe the indicators in use in order to measure quality and to see to what extent they will allow vocational training systems to develop in the right direction.

3.4 VET indicators used by National Observatories in EU partner countries

In the mid-1990s, the ETF defined 15 key indicators, designed to monitor the development of vocational training systems in partner countries (including the New Independent States and Mongolia). These indicators were gathered by National Observatories, small units responsible for gathering, analysing and disseminating VET information.

Among the indicators chosen by the ETF were the following:

- Levels of training for the total population aged 25–29, by age group and by ISCED level.
- Levels of training by gender.
- Rate of unemployment by age, gender and level of training.
- Enrolment of 14- to 19-year-olds in general education, and in ISCED level 3 vocational education by gender.
- Number and rate of unschooled 14- to 19-year-olds in the population by gender.
- Drop-outs from secondary education at ISCED levels 3A or 3B.
- Public expenditure on all education, and in vocational education.

When this list of ETF indicators was compared with education policy objectives in the New Independent States and Mongolia, there was an obvious gap between what was supposed to be measured and what was actually measured. For this reason, the project was largely redirected. The lessons learnt from this experience have been extremely helpful in setting up new projects, particularly those relating to the development of an employment/training observatory function in the MEDA region, such as the Jordanian project.

3.5 Indicators built as part of the Jordanian employment and training 'observatory function' development project

Below is a list of the indicators chosen by the project's steering group and ranked according to broad objective category with a set of context indicators.

Context indicators

- *Indicator 1:* Education level for the 16+ population by age and by gender.
- *Indicator 2:* Rate of activity by education level and by gender.
- *Indicator 2.1:* Rate of employment by education level and by gender.
- *Indicator 2.2:* Rate of unemployment by age, by education level and by gender.
- *Indicator 3:* Gross domestic product (GDP) per capita.

Preparing Jordanians for working life

(A) All technical and vocational education and training (TVET)

- *Indicator 4:* Rate of participation by age, gender and training sector.
- *Indicator 5:* Enrolment in fully school-based TVET programmes as a percentage of total TVET enrolments.
- *Indicator 6:* Rate of enrolment in initial education and vocational training per programme.

(B) Learning

- *Indicator 7:* Percentage of trainees in relation to all TVET enrolments.
- *Indicator 8:* Distribution of trainees by gender and speciality (numbers and percentages).

(C) Vocational education

- *Indicator 9:* Percentage of enrolments in vocational education in relation to all TVET enrolments.
- *Indicator 10:* Distribution (numbers and percentages) of vocational education pupils by gender and by type of education.

(D) Applied higher education

- *Indicator 11:* Percentage of enrolments in applied secondary education in relation to all TVET enrolments.

- *Indicator 12:* Distribution (numbers and percentage) of applied secondary education pupils in relation to all TVET enrolments.

(E) Technical and technological education

- *Indicator 13:* Percentage of technical and technological students in relation to all TVET enrolments.
- *Indicator 14:* Distribution (numbers and percentages) of technical and technological pupils by gender, age and speciality.

Obtaining equitable results

(A) Equitable access for groups

- *Indicator 15:* Gross TVET enrolment rate by gender and by course.
- *Indicator 16:* Net TVET enrolment rate by region and by course.
- *Indicator 17:* Gross TVET enrolment rate by region and by course.
- *Indicator 18:* Net TVET enrolment rate by region and by course.

(B) Performance/results indicators

- *Indicator 19:* Success rate by programme.
- *Indicator 20:* Drop-out rate by age, gender, programme and term.
- *Indicator 21:* TVET certificate exam success rate by age, gender and programme.

Rationalisation of investment in training

- *Indicator 22:* Percentage of current public expenditure in GDP.
- *Indicator 23:* Public expenditure on education in TVET as a percentage of total public expenditure.
- *Indicator 24:* Public expenditure on education by pupil and by type of education and training.
- *Indicator 25:* Current public expenditure on education in TVET by student in relation to the GDP per capita.
- *Indicator 26:* Distribution of public expenditure in TVET by type of education and training.
- *Indicator 27:* Distribution of public and private investment in educational establishments.
- *Indicator 28:* Distribution of TVET funds per source and by type of education and training.

Maximising the value of public expenditure in TVET (results)

- *Indicator 29:* Cost by teaching hour.
- *Indicator 30:* Cost of a graduate by programme.
- *Indicator 31:* Teaching costs by teacher.
- *Indicator 32:* Teachers' qualifications by gender, education level and years of experience.
- *Indicator 33:* Cost of continuing training for trainers by programme.

This list of indicators is very interesting and may be used as a starting point for countries that are just beginning an indicator project. In fact, they cover several very important points:

- social cohesion and access to the technical education and vocational training system;
- financing training;
- technical education and vocational training, and lifelong learning.

However, a set of development priorities have been identified in the MEDA countries with a view to making vocational training systems more efficient. Although these priority fields concern qualitative aspects and make it relatively difficult to build indicators, useful estimates must nevertheless be found:

- managing training systems, including decentralisation/autonomy of technical education and vocational training establishments/centres, getting social partners involved in all levels of the technical education and vocational training system;
- developing skills for the informal sector.

Concerning management, tools can be developed to find out where the important decisions on various aspects of vocational training are being made. For example, it is interesting to know whether vocational diplomas are created at national, regional or local level. If any skills are shared, to what extent are they really shared?

Concerning the development of the vocational training offer, it is also interesting to know who is working on, creating, deleting, editing what, and what proportion of the offer that represents.

Concerning the involvement of social partners, the frequency of their presence in decision-making bodies can be measured.

All these issues are analysed more deeply in the methodological note *Euromed Observatory Function: indicators for the governance of vocational training systems*.

Concerning developing skills for the informal sector, an extremely interesting UNESCO project in this field should be noted. In fact, UNESCO is offering to build a true information system on non-formal education, with a manual and software for implementation. This could constitute a major support for many countries.

Needless to say, indicators are offered in this information system. They concern different indicator categories focusing on the number of trainees, trainee hours, expenditure by main type of training (literacy, generation of resources, development of skills, handling the extremely disadvantaged), by source of funding, by agent, etc. (UNESCO, 2005). Incidentally, Jordan will be one of the first countries to implement this new information system (with indicators).

Without forgetting the problem posed by data availability in calculating indicators, several examples of the connections between objectives and indicators can be cited.

- To improve the qualifications of the working population. An indicator of the level of training constitutes an initial measure of qualifications, but is also necessary as a guideline. These indicators are very difficult to use when defining and pursuing an

education policy as they are too general. They therefore need to be complemented with indicators relating to the targeted skills that countries want to develop. Examples might include EU choices relating to languages, mathematics and science.

- To establish more links and pathways between education and the world of work. There are no indicators on this subject. Different kinds of relationship between education and business (e.g. traineeships, apprenticeships, other kinds of on-the-job training and twinning arrangements) must be measured to monitor this objective.
- To raise the employment rate of young people with a first level of vocational education. The unemployment rate by age and training level constitutes an initial approach. But a more accurate picture of both the unemployment and employment rates of young people who have followed various kinds of vocational education schemes will be needed.
- To develop a closer link between the content of education and vocational training and the needs of the economy and employment. There are no indicators for this subject. Data are needed on the employment of young people according to the kind of specialist training they have had, and on employment and unemployment rates according to these specialist forms of training.
- To train more young people to meet labour-market needs for skilled employees. There are no indicators for this difficult subject. To meet this requirement, it will first be necessary to define the economy's needs for skilled staff in the near future. This will involve difficult forecasting work. Which training courses might meet these needs will then need to be determined.
- To combat unemployment among young people with no qualifications. The indicator on the rate of unemployment by level of training is an initial approximation, but it needs to be complemented by regular measurement of the number leaving the education system without qualifications. In this way, it may be possible to monitor developments in this area, and ensure that this number falls. This information would complement information supplied by students who leave education at ISCED level 3. Employment and unemployment rates among these young people will also need to be measured more accurately.
- To increase access to the various levels of vocational education. Participation rates in vocational and educational training meet this need in part. They could be complemented with transfer rates from different forms of general education towards forms of vocational education.
- To improve the employment of young people who have completed vocational and educational training. No indicator is currently being developed by the ETF. Either data gathered in the course of surveys on the active population will have to be used, or a series of surveys will have to be conducted on the employment of young people who have left the education and training system.
- To increase the rate of people who complete vocational education. No indicator has yet been developed by the ETF. Data on those who have completed vocational education and training will have to be gathered and, for example, the proportion of a generation that obtains such qualifications calculated. In this way, it will be possible to verify whether the proportion is increasing.
- To reduce the number of young people leaving vocational education programmes without qualifications. No indicator has yet been developed by the ETF. The number of young people will need to be measured or estimated. Different methods can be used for this, depending on the way in which the education system is organised.

- To raise the pass rate in vocational education examinations. No indicator has yet been developed by the ETF. Vocational education examination statistics will be needed in order to calculate the pass rates over several years.

Other more qualitative objectives can be examined, such as:

- To link the education system to reforms currently taking place in society and the establishment of a democratic state based on the rule of law. No indicator has yet been developed by the ETF. Surveys of young people's public-spiritedness could provide useful information on this very qualitative and delicate question.
- To provide educational establishments with qualified specialists, and raise the prestige and social status of educational activities. For the first of these objectives, the vocational qualifications of teachers must first be measured in order to forecast recruitment needs. Future research could provide such information. For the second objective, ways of measuring the prestige and social status of educational activities must then be defined. Teachers' salaries? Graduates' salaries? People's interest in educational activities? The proportion of the budget and of GDP earmarked for education? These questions need to be discussed before the relevant indicator can be defined.
- To implement a reliable system for evaluating the quality of education. A system of indicators to evaluate the whole education system will be required, as well as a system to evaluate what pupils have learned. This is an extensive programme, calling for considerable work on the information system.
- To develop and implement a system for eliciting funds from foreign and international bodies. Many developing countries and countries in transition are working hard to rationalise their requests for external aid. It would therefore be interesting to look for indicators that take account of these operations, although no indicator of this type currently exists.
- To develop international cooperation in teacher training. No indicator on this subject is currently available. The various kinds of teacher and experience exchanges will need to be measured. Nothing has yet been done in this area.

4. MAIN STAGES OF AN INDICATOR PROJECT

We have introduced the first two phases of an indicator project: identifying objectives and choosing indicators.

We are aware of the importance of identifying the objectives that need to be measured and therefore of having education policy documents or an education and training development plan to enable this identification to be carried out correctly.

Once this work has been carried out, specific indicators will have to be built and calculated. A quality information system is essential for these tasks. If an effective information system is not already in place it is extremely difficult for this kind of project to succeed. In such cases an information system must first be implemented.

As regards vocational education and training, the problem is even more complex than for basic education as, in addition to data on initial training, the information system needs to include data on continuing vocational training, vocational transition (i.e. the transition from training/education to employment), the global functioning of the labour market, and most particularly, on people passing through the training system. A number of fields and a range of sources of information must be covered to obtain a consistent corpus of information. Few countries have comprehensive information systems, acting as a serious brake on research on indicators.

Let us suppose that one (or more) educational and vocational training information system exists, even if during the project it turns out to be inadequate.

First, available sources and data must be identified.

The next stage, which involves calculation, is not as easy as it looks. One of the reasons is that different calculation methods may be used. The importance of a precise indicator definition must therefore be stressed, and particularly the need for a glossary of terms used. These matters, addressed in detail below, concern verifying the consistency of outcomes, the analysis of indicators, and the format of the document using the calculations.

4.1 Comments on gathering data

To make data more speedily available, a growing number of countries are conducting rapid surveys based on representative samples of institutions and subpopulations (e.g. households and workers in a given economic sector) to obtain data

on education, employment integration and vocational training. A tool of this kind can be particularly useful, for example, in the following situations:

- to lighten the load that falls on education and training establishments, some information (which, for administrative reasons, needs not cover all institutions) needs only be gathered from some of them;
- to obtain rapid feedback, such as on the implementation of a new policy, a sample of institutions, or a well-targeted subpopulation, can provide relevant data;
- to find out about the employment integration of young people, or the employment situation of young people who have only just left the education system with a diploma, or even following highly specialised training;
- to find out about the careers of young people who have left the education system in the last three to five years;
- to assess participation in continuing vocational traineeships.

Concerning the employment of graduates, a sample can provide information on the conditions and quality of their integration except, of course, where the training or specialist course has involved a very small number of students, and too few have been interviewed. This is where the limitations of sample-based surveys begin to show.

Most information that derives from household surveys (e.g. level of population, participation in traineeships) is contained in such a framework, and accordingly has advantages and limitations.

It is important to note at this stage that the objectives of a handbook of indicators and those of a statistical yearbook are not the same. The former aims to display developments in the education system, underline certain trends and highlight problems. The latter seeks to bring all education data together in one comprehensive volume. The latter must be exhaustive; the former need not be.

Consideration of indicators can improve the information system (in terms of both volume and reliability). In fact, the publication of indicators involves giving information back to those who produced it in the first place (e.g. heads of establishments, regional departments and producers of statistics). They can then see how important and useful their information-gathering is, and what use is made of it.

There is much debate at the moment about the reliability of data. True, it is often difficult to be sure of the accuracy of a given piece of information about school enrolment or the functioning of the labour market. But we cannot expect some hypothetical data reliability to fall from the heavens. On the contrary, quality can be improved by publishing and using the data – while, of course, taking the necessary precautions. This is the statisticians' virtuous circle.

It should also be pointed out that some problems are so obvious that they do not need accuracy below a few per cent. Thus, despite considerable uncertainty as to the quality of demographic data, and of data relating to education and employment, the decline in preschool education and high rates of unemployment in the New Independent States are not disputed. Similarly, there will always be considerable differences between urban and rural areas. The quality of this data will be improved by placing the statistics in a living context.

Moreover, political decision-makers will be able to give more support to the work of services that supply them with directly usable information.

This is one of the advantages that should not be forgotten of an indicator project.

4.2 Census of available sources and data

We have seen that certain planned indicators had to be dropped due to a lack of available data or because it was impossible to find an effective measuring method. This phase of identifying available sources is therefore very important and should allow each of the planned indicators to be calculated. All sources that can be used must therefore be identified.

Most data on education, particularly on vocational education, come from annual school censuses and staff surveys, examination results and infrastructures. Some is Ministry of Education internal data, but not necessarily from the statistics department. For example, although data on students and establishments are normally available to the statistics department, data on staff, their status, their accommodation conditions, and their initial and continuing training are often held in these employees' management directorates.

Demographical data are usually the responsibility of National Institutes of Statistics. This is very important as it is crucial to have data per age for all years. Estimates made for inter-census and post-census years (in the case of the last census carried out) must be of high quality. Otherwise, enrolment ratios may, like all indicators involving a sound knowledge of population data, be badly distorted. Similarly, it is important to have regional data in order to take account of regional disparities in enrolment. Lastly, projections are needed to forecast school enrolment and recruitment needs for teachers. It follows that some forecasting indicators might also be constructed.

Financial data come from the directorate with responsibility for financial matters and from the National Institute of Statistics, responsible for accounts. Many indicators need data such as GDP and analysis of the state budget.

It is also possible to use incomplete data about certain regions or a sample of students. Inspection reports, for example, are an important source of information on teaching materials and the training of teachers. They can illustrate an analysis. Selective data gathered for a particular study or report can be used in the same way.

There must be no hesitation in using data from a survey, so long as the sample is well constructed and representative of the level under examination. It is sometimes essential to use sample-based studies as full studies are too expensive to carry out. Their level of accuracy is quite acceptable for analysing many problems encountered in the education system.

In the case of vocational training, all available information on formal, non-formal and informal training must be mobilised. Here again, it is necessary to define exactly what is meant by these terms. Once more, a glossary containing the main definitions used in gathering data and calculating indicators is essential. Information should be organised by section of population (e.g. young people, adults, gender), and duration of training schemes because,

unlike initial training, the duration of vocational training can be very different to the school year. Knowing the number of enrolments alone is therefore not enough. The duration of the training courses followed is also needed, as the number of days (or hours) of training can be worked out from this. The average duration of training for each enrolment can then be calculated. Another important element in vocational training is to try and find out exactly how many people have taken part in these training schemes. Here again, the number of enrolments is not enough, as an individual may have taken part in several training exercises in a given period (e.g. the school year). The Ministry of Vocational Training may obtain data based either on a census of various training schemes or surveys based on samples (e.g. of households) that include questions about vocational training courses undertaken during a reference period.

A good knowledge of forms of certification awarded by type and by training specialisation is also required. This information is normally available from the various certification bodies but a number of other establishments, including the Ministry of Education, the Ministry of Vocational Training, the Ministry of Health, the Ministry of Labour and vocational bodies, often need to be contacted.

As stated earlier, a comprehensive picture must be built up of the various sources of funding for vocational education and training (e.g. ministries, local authorities, private companies and households).

Furthermore, data on young people's employment and on the transition from vocational education to employment are needed. For this, either household surveys (of the 'employment survey' kind) that include questions on the previous situation (in this case, 'while undergoing training'), and on the employment situation at the time of the survey can be used, or special surveys using samples of young people leaving the education and training system. This latter type of survey usually provides more accurate information, and makes it possible, for example, to measure differences in integration that are linked to specialised training: specialised industrial training produces better integration than specialised tertiary training, for example. But it is also more expensive.

Lastly, it is good to have forecasts of the needs of the economy and society in order to put predictions and the training system into perspective.

As far as non-formal education is concerned, the project on indicators must support the creation of information systems as these are only just being implemented in a small number of countries.

4.3 Examples of data collection at European and global levels

4.3.1 Eurostat data

The calculation of the indicators drawn up as a follow-up to the Lisbon process is based on regular data-gathering by Eurostat. These data are based on those from national ministries dealing with education and training used to fill in Eurostat questionnaires as well as on labour force surveys harmonised at EU level. Eurostat thus guarantees data comparability. Moreover, periodic surveys update knowledge of the training activities financed by companies.

General indicators are calculated annually on the basis of these data. For example:

- Permanent education by gender: percentage of the adult population from 25 to 64 years old having attended a training course or similar. Permanent education refers to the respondents from 25 to 64 having attended some classes or training during the four weeks preceding the survey (numerator). The denominator is the total population of the same age, excluding non-replies to the question on training and lessons attended. The numerator and denominator are extracted from the European Communities labour force survey (LFS). Collected information concerns all forms of teaching or training, whether or not pertinent for the current or future employment of the respondent.
- Students involved in vocational higher secondary education by gender. This indicator provides information on the percentage of boys and girls in the second cycle of secondary education who are registered in the vocational field. It indicates the importance of initial VET in a country, keeping in mind the male/female dimension.
- Unemployment rate of the total population from 25 to 59 years old by education level and gender. The indicator measures the 'probability' of the employed becoming unemployed, broken down by education level. It allows for evaluation of the difficulties encountered in the labour market by people with different education levels and gives a preliminary idea of the role played by education in reducing the likelihood of unemployment.
- Level of young people's education by gender. Percentage of the population from 20 to 24 years old having reached at least higher secondary education level. The indicator is defined as the percentage of 20- to 24-year-olds having reached at least secondary higher education or training, or ISCED levels 3 to 4 as minimum (numerator). The denominator is the total group of population of the same age, excluding non-replies to the question on the level of education or training reached. The numerator and denominator are taken from the labour force survey.

The indicators presented above are periodically calculated as part of the follow-up to the Lisbon and Copenhagen processes.

Note that Eurostat's work is of vital importance in calculating indicators and monitoring the objectives of the Lisbon process. Harmonised data on all MEDA countries are clearly essential to obtain comparable indicators. It is therefore vital that the MEDSTAT and MED-SOC programmes develop quickly and provide the data required to calculate the indicators defined under the MEDA-ETE project[1]. It should however be pointed out that a full year is needed to plan a labour force survey because the model European survey must be adapted to the MEDA context, the investigators trained and the statistical tools adapted. Another year is needed to carry out the complete survey and to analyse the initial results. For a survey decision in January 2006, we can therefore hope for results from January 2008 if all goes well.

1 The MEDSTAT programme aims at developing the information systems and improving the quality of existing services provided by the 12 Mediterranean partners statistical systems (national statistical offices and other institutions). MED-SOC is a subprogramme dealing with social statistics. MEDA-ETE covers education and training for employment.

4.3.2 ILO data and indicators

The International Labour Organization (ILO) provides data and key indicators on the labour market worldwide. This information is of interest in defining the context of vocational training. These indicators are as follows:

- labour force participation rate
- employment to population ratio
- status in employment
- employment by sector
- part-time workers
- number of persons working less than 20 hours or more than 40 hours a week expressed as a percentage of the total employment
- hours of work per person per year
- informal sector employment according to a harmonised definition or a national definition, broken down by micro enterprises (harmonised or national definition)
- unemployment and unemployment rates according to ILO standards
- youth unemployment
- long-term unemployment
- unemployment by educational attainment
- underemployment in terms of duration of work
- inactivity rate for the age group 25–54
- labour force age 15 or above by educational attainment
- labour force 25–29 with higher education
- illiteracy for persons age 15 or above
- manufacturing wage trends
- occupational wage and earning indices
- hourly compensation costs in manufacturing industries and the annual change in these costs in percent
- labour productivity and unit labour costs by economic sector
- labour market flows
- poverty and income distribution.

Note that a small number of MEDA countries have so far provided data to the ILO for calculation of the indicators. The MEDA-ETE project can create a favourable dynamic to fill these gaps and it is thus important to associate the ILO with the project.

4.4 Calculations

A calculation formula has to be explained for each indicator. Using this procedure, a detailed list can be made of the basic information needed to calculate the indicators. For example, for the net enrolment rate for the theoretical ages of vocational education, the school rolls at these ages and the total population of these ages must be known. This explanation is also necessary because the same indicator can often be calculated in different ways by different people. This is also true of other data, such as enrolment and access ratios. The aim is to avoid, or at least limit, any ambiguities. At this stage, it is interesting to specify the desired breakdowns when calculating indicators: by age, gender and various categories.

A standard document could be used with the following format:

Indicator sheet	
Indicator	
Aim – link to defined objectives	
Precise definition	
Level	
Breakdown	
Method of calculation	
Source	
Validity	
Frequency	

A few examples follow based on this standard document.

Indicator: Gross intake rate in vocational education.

- Aim: To measure the increase in the capacity to accept students on vocational education courses.
- Level: National and regional.
- Breakdown: By gender.
- Method of calculation: Numbers of new enrolments in vocational education/Population of vocational education theoretical age group (e.g. 14 years).
- Source: Annual school census.
- Validity: ? (in practice, the validity of data can be uncertain).
- Frequency: Annual.

Indicator: Gross enrolment rate in vocational education.

- Aim: To measure the capacity to accept students on vocational education schemes.
- Level: National and regional.
- Breakdown: By gender.
- Method of calculation: Total number of students on vocational education at all ages/Population of vocational education theoretical age group (e.g. 14–16 years).
- Source: Annual school census.
- Frequency: Annual.

Indicator: Net enrolment rate in vocational education.

- Aim: To measure the intensity of enrolment in vocational education.
- Level: National and regional.

- Breakdown: By gender.
- Method of calculation: Enrolment figures for a given age group in vocational education/Population of this age group.
- Source: Annual school census.
- Frequency: Annual.

Indicator: Rate of transition into technical and vocational education.

- Aim: To measure access into technical and vocational education.
- Level: National and regional.
- Breakdown: By gender.
- Method of calculation: Number of students admitted into first year of technical and vocational education during a given school year/Number of students enrolling in the last year, for example, of basic education during the preceding year.
- Source: Annual school census.
- Frequency: Annual.

Indicator: Rate of vocational education graduates.

- Aim: To measure the proportion of a generation that obtains a vocational education diploma.
- Level: National and regional.
- Breakdown: By gender.
- Method of calculation: Number of vocational education graduates in a given school year at a theoretical age for obtaining the diploma/Total population at this age.
- Source: Annual school census.
- Frequency: Annual.

It is helpful if sources that have supplied data indicate their validity, thus giving the reader a more precise understanding of the information provided.

It is also important to define the terms used, and a glossary is essential in the final document. Some examples of definitions are given below. Note however that glossaries vary from country to country depending on how the indicators are interpreted. For international organisations, it is clearly desirable that they should use the same definitions. Sadly, this aspiration is rarely realised.

During the indicator definition and implementation phases, a glossary of specific definitions should also be included.

4.5 Verifying the consistency of results

After the various indicators have been calculated, the consistency of the results should be verified. In practice, a number of information sources are mobilised. All statisticians know the problems of using information in this way. For example, net enrolment ratios should not exceed 100 %, they should not be inconsistent with activity ratios, and education expenditure supplied by the Ministry of Education should be the same as that provided by the Ministry of Finance or the National Statistics Institute. This work is very important as it guarantees the validity of the whole exercise, and must be allocated the necessary amount of time.

Some examples of problems: in OECD's *Education at a glance*, if net enrolment and activity ratios for post-primary education are added, ratios above 100 % are obtained for several countries. This arises from a problem of definition. In fact, on-the-job training schemes are counted twice as the young people concerned are undergoing training but at the same time have an employment contract.

Net enrolment ratios sometimes exceed 100 % when demographic data and school data are inconsistent. In some countries, and particularly in the capital, net enrolment ratios can exceed 100 % because children who come from isolated parts of the country that have little school equipment are enrolled in regions where enrolment is well-developed. In one country, for example, the net enrolment rate exceeds 100 % in the western area because that is where children from neighbouring districts are educated.

Concerning financial data, use is often made of the approved budget as the easiest information to find. It is often also the most recent. However it can be very different from the implemented budget. This is often decided very late in the day, with a delay of one or two years. This has to be researched very specifically for all these problems to be clarified and series of consistent data constructed. If such research already exists, it is clearly very valuable. But estimates have to be made if it is impossible to harmonise all the data. They need reliable elements over several years to make them possible. The other solution is to clearly indicate the sources of data, and to explain why there are differences. Let us not forget that this document is aimed at non-statisticians. It is therefore wrong to use stereotyped formal language, and concepts associated with the various data should be comprehensible. It is not possible to say everything with statistics. This is what verifying consistency is all about. It is important not to miss this target, which will be reached only through transparency.

It is worth repeating here that accuracy is not a *sine qua non*. It is possible to monitor developments in the education system and identify crucial problems (which is what an indicator document is meant to achieve) even if the data are not particularly accurate.

4.6 Analysing the various indicators

Analysis is vital if the work is to be successful. It must be accessible to all those involved in education and thus treated with great care. The simple presentation of information is not easy, particularly for statisticians. But the quality of the document will be judged by the clarity of the text. Even if the phenomena displayed are complex, they need to be presented simply, without any loss of accuracy.

If the diffusion media is paper, the documents are often drawn up according to the same logic: each indicator (or group of indicators) fills a double page, and each page consists of some text complemented by tables and graphs.

The text is based on a general analysis of the indicator, and more particularly of how it has developed. The most recent results are then expanded. Next, one or more breakdowns of this indicator are studied: for example, by gender and then by region. This commentary must be sober and precise, and comprehensible to the non-specialist.

Too many figures make a text difficult to read, particularly if they are in a table or graph. Tables and graphs must be chosen carefully, and provide as much information

with as few data as possible. As indicators, they can present a chronological series, a breakdown of the indicator according to a category and, if data are available, distribution by region. Graphs most commonly use:

- curves to present chronological series;
- histograms to present breakdowns in a given indicator by region or by gender;
- cartographical representations to highlight diversities and regional disparities.

In a document of this kind, lack of space precludes the presentation of large amounts of data and graphs on all data. The choice is therefore made on the basis of the requirement for accuracy or greater intelligibility.

If we see a slight shift in an indicator as education's share of GDP, we can present a table with the exact value varying slightly, but this will be difficult to read on a graph. By contrast, access rates that have developed substantially are more visible on a graph than in a table.

The principle is to be flexible, and always to go for the representation that is easiest for the non-specialist to understand.

We shall add three comments here concerning the analysis and choice of indicator, the presentation and design of the graphs, and lastly the period presented.

4.6.1 Analysis and final choice of indicator

Analysis of a phenomenon can result in a change in the choice of indicator. In this way, it is possible to study changes in boy/girl disparities in a given area of education in a given country.

The basic data are as follows:

School year	Total number of students	Total number of boys	Total number of girls	% girls	Gross enrolment rate (boys)	Gross enrolment rate (girls)
1989/90	301 218	208 634	92 584	30.7	39.3	16.7
1990/91	346 907	237 456	109 351	31.5	44.5	19.7
1991/92	359 406	246 156	113 250	31.5	44.6	19.7
1992/93	421 869	289 092	133 777	31.7	51.1	22.8
1993/94	471 792	317 654	154 138	32.7	55.2	25.7

The rising percentage of girls at first glance seems to indicate that gender disparities have fallen. However, as we continue our analysis, the gap between the total number of boys and the total number of girls, or the gap between boys' and girls' enrolment ratios, has increased. We can therefore conclude that disparities have increased, and to demonstrate this, it is preferable to choose one of the gaps rather than the percentage of girls. In this way, we can examine the table from a different angle, and calculate the boy/girl ratio (or the opposite). This time, we note that the former has fallen slightly (2.25 in 1989/90 compared with 2.06 in 1993/94). Thus, in relative terms, the total

number of girls has risen a little more quickly than the total number of boys. Using the same basic data, we can therefore deduce two indicators that give different impressions and apparently contradict one another. In fact, this contradiction is only apparent. The absolute gaps and this relative growth are two sides of the same problem and complement one another.

In any event, it is clear that the percentage of girls, taken on its own, is not a good indicator of changes in disparities.

It follows that we have to be careful when choosing how to calculate the indicator. Analysis can, as a result, play a role in redefining the indicator. We cannot stress enough how important it is to have a clear analysis of these questions. It is therefore very important to check that the chosen indicator and its method of calculation correspond to the question for which the indicator has been created.

4.6.2 Choice of type of graph and period

Graphic presentation

The presentation of an indicator is another important element. In fact, depending on the choice of type of graph, and even of the form, it is possible to change the perception of a non-specialist. For example, by focusing on the breadth or length of the graph, i.e. on its scale, perception of developments and disparities can be accentuated or diminished. It is therefore important to represent the graph relevantly in such a way as to facilitate visual analysis.

Period presented

The breakdowns and the periods presented also have an impact on the presentation of the indicator.

For a more precise idea and a fuller presentation of the items discussed in 4.6.1 and 4.6.2, various publications on indicators are available: *Key indicators – educational indicators and policies* (ETF, 2003) and *Indicators for educational planning – a practical guide* (IIEP, 1997)[2].

To sum up, several points must be emphasised.

- The choice of graph is very important.
- As far as the text is concerned, the terminology must be precise. It is necessary to ‘educate’ the reader by always using correct terms. This is very important for communication.
- If a graph is complex, it must be accompanied by comments to aid comprehension.
- If data relating to a given phenomenon come from several sources and are different, the reason for this should be given in simple terms in order for the document to be credible.

Success depends on the quality of work carried out in this section. It is therefore necessary to devote the maximum resources to it, mobilising all skills and striving to

2 Available in Arabic, English, French and Spanish.

produce relevant, short syntheses. The essential ideas should be conveyed without foregoing the nuances associated with a system as complex as the education system. It is also important not to underestimate the time needed to put this information together.

A project leader must take on the role of chief editor, checking that the editing style is consistent, particularly when there are several editors, and that all the indicators used are consistent (years of observation and the presentation of tables and graphs). For example, a project leader must ensure that the document uses the same symbols in all graphs. Ideally, they should be in charge of a team of statisticians and/or analysts who produce the document after they have shared out the indicators according to their skills. Each editor will then take responsibility for their own indicator(s).

Given the breadth of the work involved, the project leader must be assisted by another person with experience as a chief editor to lay down an editorial line and harmonise the various editors' styles and ways of working. Too much diversity is unacceptable in a work of this type.

Training and expert assistance will often be required in this area in particular.

4.7 The critical need for transparency in using the indicators

Disseminating a document on indicators demonstrates a desire for transparency in the way in which schools or vocational education function within a country or even for carrying out comparative studies at regional level. For this reason, decision-making on the circulation of this type of document is political. It is therefore necessary to secure the support and approval of the competent authorities (minister, secretary of state, etc.). It is the minister who will validate the document – or, better still, write the preface.

This is not always easy, but it is fundamentally important. It is vital to persuade political decision-makers of the need to publish information on a wide scale and, as has sometimes happened, to ensure that documents of this type do not lie gathering dust in (sometimes armour-plated) cupboards.

As soon as the document is published, it must be disseminated widely, and fed into the debate on schools or vocational training. It must therefore be accessible both privately and publicly in the field of education and vocational training.

The aim is that it should become the reference work in political discussions and in the media. This is an ambitious objective, but it is the objective that must be set for a project of this kind.

Obviously, the operation will only be really successful if publication of the document supports, or follows, a change in the way in which decisions are made: the culture of the given objective must spread and develop. Without this change, the document will become less interesting and less useful. Documents of this type used to appear and then disappear because they had made no real impact. The ball is now in the decision-makers' court. Not only must the producers of the document do everything in their power to demonstrate how useful it is, they must render it indispensable.

4.8 Updating the indicators

It is not enough to publish the indicator document once, and then, after putting in so much hard work, go no further. To be used and to be useful, it must become a standard text, to achieve which there is only one solution: it must be revised regularly so that the most recent data are always available. This in turn has an impact on work organisation and data collection.

Computer tools allow texts, tables and graphs to be updated relatively easily. The data can be organized on a spreadsheet and the same layout retained for each edition. Updating must take place as soon as new data become available. It is, of course, possible to make use of automatic procedures, but they can sometimes be more cumbersome than manual updating. It is therefore necessary to analyse procedures properly before investing in automatic updating. The best idea, naturally, is to move rapidly towards annual publication. That must be the objective.

As indicated above, the chief editor must succeed the project leader. For the operation to become routine, the editor must enjoy a complete interface with the departments concerned. It is the chief editor who maintains document quality and consistency, and who avoids any mistakes, including those associated with the first issue (e.g. requests for more information and indicators, etc.).

It is also important to provide international comparisons in a national document.

The main difficulty for a document that focuses on a region is the availability of data, as often, for example with financial indicators, it is impossible to obtain the same detail at regional level as at national level. As for tools, cartographic software is required to achieve the best visual representation of regional diversities.

Work on indicators can also focus on educational establishments or vocational training centres. By the same token, it must deal with how they function and their results. In these circumstances, each indicator for a given establishment must be accompanied by its regional and national values. These reference data are very useful in helping establishments compare themselves with one another.

In summarising the above sections, we conclude that there are always two stages in the analysis of indicators that must be present, and which are the core of any work of this type: descriptive analysis and causal analysis.

4.8.1 Descriptive analysis

Descriptive analysis involves presenting and describing distributions relating to official standards or objectives. Chronological analysis and the analysis of disparities (e.g. by region and gender, or between urban and rural areas) will complement the comparison of standards.

This analysis will first and foremost look at school and vocational education intake and enrolment ratios at various levels, and in particular at educational and vocational training. It is very important to have net ratios that take account of the intensity of enrolment. Gross ratios only give an indication of the ability of the system to take in students.

Some indicators of expenditure and cost are also essential: these include educational expenditure as a percentage of the national budget or GDP, distribution of expenditure by type (e.g. operational and equipment costs), and sources of finance.

In addition to these indicators, in vocational education and training, it is vital to have indicators covering all expenditure (irrespective of its source), activities (whether they concern young people or adults, and formal, non-formal and informal training), the level of people's training and skills, access to (and outcomes of) various forms of vocational certification, and the employment of young people who have undertaken forms of training.

4.8.2 Causal analysis

Causal analysis is required because the descriptive analysis referred to above is not enough. It is also necessary to try and understand, explain and introduce causality into the relations between the other variables highlighted by the descriptive analysis. The choice of indicators will depend on the objectives chosen. Three must always be present: quality, effectiveness, and analysis of costs per student and per level.

1. Quality of teaching: number of hours of lessons, reception of students (length of training, numbers of students per class or per teacher, refectories and boarding facilities), teachers' qualifications, and available teaching materials.
2. Effectiveness or results: this will use the rates of access at various levels, annual repetition rates, drop-out rates, and pass rates at examinations. The results of pupil evaluations will be introduced here if such information is available. With regard to educational and vocational training, the quality of integration according to the kind of training undergone and the quality of the link between the way in which the education system works and the needs of the economy (or, more generally, of society), and the evaluation of its impact on the level of the population's training and skills are elements that, ideally, could be analysed using the available indicators.
3. The analysis of costs per student and per level will verify whether expenditure matches objectives: for example, is there optimal distribution between basic and higher education? The same question might be asked about the distribution between general and vocational education.

Clearly, the final list of indicators can only be fixed after checking the availability of the data necessary for calculating the indicators. It will therefore always be a compromise between the desirable and the possible. Research on indicators will probably result in the introduction of new questions into existing surveys, and even the construction of new surveys. For example, in vocational education and training, it has been observed that the data needed to calculate relevant indicators were very often lacking. It follows that work in this field is particularly gruelling.

No more than 40 indicators should be considered as the document becomes unusable if there are any more. To avoid turning the planned document into yet another statistical yearbook, it is important to preserve the concept of an indicator as defined above.

5. ORGANISATION OF AN INDICATOR PROJECT

Two levels of organisation are required: a steering group, and a working group charged with seeing the project through. This is a fairly classical but vital approach to running a project. Deadlines will be clearly defined, with a strict timetable for establishing indicators for the working group, and a political validation timetable for the steering group.

First, the choice of indicators must be discussed by high-ranking officials in all departments. A steering group of representatives of various ministries where higher education and vocational training are administered separately, can therefore be very useful to ensure that the whole education system is involved and not just the education ministry.

Once the main guidelines and objectives to be measured have been defined by the steering group, a working group consisting of a small number of experts under the project leader needs to cover all aspects of these specific tasks.

The total time from the beginning of the project to the publication of the first issue of the document should not exceed 18 months, as a tight deadline will involve and mobilise all concerned.

Two or three meetings of the steering group are needed to produce the final list of indicators that will appear in the publication, after which changes can only be made if serious and unexpected problems arise relating to the availability of data.

After validation, the steering group will again intervene during the final discussion on the document prior to publication.

For the exercise to continue, departments of the ministry or ministries must be involved. After the first issue has been published, work should start on the second: this is the key to the project's success. If the exercise ends after the first issue, the objective has not been met. As government departments will produce the document in future, they should have been involved from the outset, as emphasised above, so that the work merges into that of the departments. The chief editor who followed up the work of the project leader must, of course, stay on.

6. ADDITIONAL EXAMPLES FROM VOCATIONAL EDUCATION AND TRAINING

6.1 Links between training and employment; vocational training; vocational certification

It is particularly important to evaluate certification by examining the employment of young people leaving the education system with vocational training diplomas, to verify their relevance and their recognition by employers. In several European countries, for example, the commissions responsible for setting up and modifying vocational diplomas attach great importance to surveys on the employment integration of young people. A number of surveys have been carried out covering periods ranging from seven months to five years after students have left the education system. In the longer surveys a number of employment trajectories can be studied.

The results of these surveys, and particularly the various indicators obtained, are useful pointers to the need for change in the content of training schemes, and therefore the certification, or of ending a given training scheme. Indicators include date of access to employment, total duration of employment, time spent unemployed, type of employment (linked or otherwise to a diploma), status of employment (i.e. precarious or stable), and salary.

When setting up a diploma, it is vital to use information from the introduction of training schemes similar to those under development, particularly concerning any changes in the sector targeted by the training.

6.2 Human resource management and recruitment of young people

Human resource management provides an opportunity to observe the recruitment behaviour of enterprises, and to identify changes in their demands, or developments in employment in a sector targeted by training schemes. For example, where it has been shown that secretarial jobs are no longer being offered to holders of initial diplomas in vocational training, but to more qualified young people, these first-level training schemes must be adapted. In some industrial sectors, too, companies have become more demanding and training schemes have had to be adapted. However, the behaviour of enterprises may well be linked to the state of the market: high unemployment may lead to the recruitment of more highly qualified staff simply because they are available and not necessarily more expensive.

More general information should therefore be obtained on the training/employment relationship, for example from labour force surveys on the active population.

Indicators providing information on businesses and sectors that recruit young people leaving the education system are also very useful. An indicator of the proportion of leavers recruited, broken down by economic sector and size of enterprise, often serves to put statements from both sides into perspective and is therefore an important tool in the dialogue between the education system and enterprises.

6.3 The training/employment relationship at macroeconomic level

At macroeconomic level, it is important to verify the main balances between the needs of the economy and the operation (and therefore 'production') of the education system. If it is clear that there cannot be a satisfactory match between these two elements, the gap must remain small and not result in serious dysfunction. This work must be based on the facts and it must be prospective. This is all the more important given that the demographic situation indicates that tension in the labour market is very likely to be associated with a large number of retirements. Very useful comparisons can be made between indicators on the levels of training required by the needs of the economy and indicators on the observed or predicted levels produced by the training system. Major imbalances can trigger remedial actions that can affect the education system and human resource management in businesses. In practice, an on-the-job training and internal promotion policy can usefully 'nudge' the education system into a frantic race to raise the level of training courses.

Regular observations and reports on the training/employment relationship and on forecasts are thus essential, notwithstanding the limitations of prediction exercises.

6.4 Lifelong learning and non-formal education

Attention has been drawn to the importance of training during working life and to non-formal education. Indicators are thus essential that can measure the importance of these training measures and their impact on careers and economic development. Information on the development of types of certification is also useful. The development of training schemes and forms of certification during working life (after initial training) will be a major issue in the future. Similarly, non-formal education will play an extremely important role in development.

The UNESCO *NFE-MIS handbook: developing a sub-national non-formal education management information system*, already mentioned, aims to build capacities at national and subnational levels to plan and implement non-formal education management information systems.

7. CONCLUSION: ELEMENTS FOR FURTHER REFLECTION

Vocational training occupies a very important place in development strategies. It is thus very important that the MEDA countries obtain a whole set of indicators on vocational training. The approach suggested in this methodological note, linking the choice of indicators to the objectives of vocational training policy, is in tune with the expectations of decision-makers.

To create a regional dynamic on these questions, it is of a great importance to try to build a set of comparable indicators for the MEDA area. To achieve this goal, a collection of information must be built up that can be harmonised with the model labour force survey led by Eurostat and be made comparable with the data of the ministries involved in training.

The MEDA-ETE project must thus establish close links and be based on the investigations carried out within the framework of the MEDSTAT and MED-SOC programmes.

As indicated in Chapter 4, note that the installation of harmonised investigations demands, if all goes well, a year of experimentation and a year of realisation and analysis of the results. Statistical surveys must therefore start as soon as possible to allow the MEDA-ETE project to benefit from the initial results of the experiments.

The definition and choice of indicators should on the other hand feed reflection on the content of the harmonised questionnaires.

This double approach is recommended as the only way forward that is based on statistical realities. Because this all takes time, the coordinated work should be started as soon as possible.

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