Chapter 2

Conceptual framework for data collection for education statistics and indicators

This chapter sets out the conceptual framework for international education statistics and indicators which have driven the development of definitions and the data collections. It begins with a short historical perspective of the development of OECD statistics and indicators on education and describes the organisation of the OECD Indicators of Education Systems (INES) Programme.

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2.1 The development of international educational statistics and indicators

During the 1980s, there was increasing demand for information on education and the need for improved knowledge about the functioning of education systems. This raised many questions not only about data collection but also about the organisation, reporting and interpretation of the data. These questions led authorities in the OECD member countries to consider new ways of comparing their education systems. They reached agreement on the feasibility and utility of developing an international set of indicators that would present, in statistical form, key features of their education systems.

The OECD's Centre for Educational Research and Innovation (CERI) responded to this demand for comparative information by initiating the OECD's Indicators of Education Systems (INES) Programme. The programme developed a provisional framework for organising the indicators, proposing a set of indicators and the methodologies for measuring them. This framework has been considerably developed since then and is presented in the next section of this chapter.

The first set of indicators was published in *Education at a Glance* in 1992 and drew mainly on existing data sources. The work to produce the first *Education at a Glance* exposed weaknesses both in the underlying statistical classification (the International Standard Classification of Education, ISCED) and in the data collections themselves. Since then much work has been put into revising ISCED and improving the methods and instruments for the international data collection on education. This handbook describes the concepts, classifications and definitions that are the result of that work to date.

The OECD education indicators are clearly the product of an ongoing process of conceptual development and data collection. The objective is to link a broad range of policy needs with the best available international data. In each area of work, the following considerations have, traditionally, guided the indicator activities:

- First, emphasising those education issues where the international comparative perspective can offer significant added value over and above what can be achieved through national analysis and evaluation.

- Second, seeking to strike an appropriate balance between focusing new developments on areas where the feasibility of data development is promising, and not neglecting important areas where substantial investment in conceptual and empirical work is needed to further the policy debate.

- Third, continually reviewing the work to ensure that the outcomes are cross-nationally valid and reliable.

The indicator programme places increasing emphasis on integrating its work through the perspective of lifelong learning, with the aim of progressing from a model of education built around institutions to one that looks more broadly at the extent and benefits of learning throughout life. In addition, various activities within the programme are seeking to better reflect equity-related issues, through assessing differences and inequalities among individuals and groups of individuals.

The OECD's INES programme is overseen and co-ordinated by the following bodies:

- The Education Policy Committee oversees the strategic direction, coherence and quality of the OECD's overall work on education.

- The INES Working Party oversees and co-ordinates the statistical work as well as the development of indicators and quantitative analyses needed to meet the requirements and priorities of the Education Policy Committee. The working party also sets priorities and standards for data development, analysis and reporting for INES, and provides direction on the dissemination of the programme's policy advice, analysis and research to a wide range of stakeholders.

In addition, two networks of technical experts from member and partner countries develop and refine indicators for the INES programme:

- The INES Network for the Collection and Adjudication of System-Level Descriptive Information on Educational Structures, Policies and Practices (NESLI) focuses on system-level indicators in education.
- The INES Network on Data Collection and Development on Economic, Labour Market and Social Outcomes of Education (LSO) focuses on developing indicators on various outcomes of education, including labour market, economic and social outcomes.

Each of these groups meets biannually and is made up of national representatives from some of the OECD's member and partner countries. The European Centre for the Development of Vocational Training (CEDEFOP), Eurydice, Eurostat, the European Commission and the UNESCO Institute for Statistics are also observers to the INES programme.

2.2 The organising framework for the OECD education indicators

The OECD's education indicators represent the consensus of professional thinking on how to measure the current state of education internationally. They provide information on the human and financial resources invested in education; access to education, progression, completion and transitions from education to work; the learning environment and the organisation of schools; the quality of learning outcomes; and the economic and social returns to learning.

The education indicators are organised thematically and each is accompanied by relevant background information. The indicators are presented within an organising framework which:

- distinguishes between the actors in education systems: individual learners, instructional settings and learning environments, educational service providers, and the education system as a whole
- groups the indicators according to whether they are measures of learning outcomes for individuals and countries, policy levers or circumstances that shape these outcomes, or antecedents or constraints that set policy choices into context
- identifies the policy issues to which the indicators relate, with three major categories distinguishing between the quality of educational outcomes and educational provision, issues of equity in educational outcomes and educational opportunities, and the adequacy and effectiveness of resource management.

Table 2.1 shows the first two dimensions of this framework.

■ Table 2.1 ■
Education indicator matrix

	(1) Education and learning outputs and outcomes	(2) Policy levers and contexts shaping educational outcomes	(3) Antecedents or constraints that contextualise policy
(A) Micro-level: Individual participants in education and learning	(1.A) The quality and distribution of individual educational outcomes	(2.A) Individual attitudes, engagement, and behaviour	(3.A) Background characteristics of individual learners
(B) Meso-level: Instructional settings	(1.B) The quality of instructional delivery	(2.B) Pedagogy and learning practices and classroom climate	(3.B) Students' learning conditions and teachers' working conditions
(C) Meso-level: Providers of educational services	(1.C) The output of educational institutions and institutional performance	(2.C) School environment and organisation	(3.C) Characteristics of service providers and their communities
(D) Macro-level: The education system as a whole	(1.D) The overall performance of the education system	(2.D) System-wide institutional settings, resource allocations, and policies	(3.D) The national education, social, economic and demographic context

The following sections discuss the matrix dimensions in more detail.

Actors in education systems

The OECD/INES programme seeks to gauge the performance of national education systems as a whole, rather than to compare individual institutions. To supplement these national data and facilitate more detailed policy discussions, OECD compiles some information on subnational entities. However, there is increasing recognition that many important features of the development, functioning and impact of education systems can only be assessed through an understanding of learning outcomes and their relationships to inputs and

processes at the level of individuals and institutions. To account for this, the framework distinguishes one macro-level, two middle (meso) levels and one micro-level of education systems. These are:

- the education system as a whole
- the educational institutions and providers of educational services
- the instructional setting and the learning environment within the institutions
- the individual participants in education and learning.

These levels relate to the entities from which data are being collected but their importance mainly derives from the fact that many features of the education system play out quite differently at different levels of the system. This needs to be taken into account when interpreting the indicators.

For example, at the level of students within a classroom, the relationship between student achievement and class size may be negative if students in small classes benefit from improved contact with teachers. At the class or school level, however, students are often intentionally grouped so that weaker or disadvantaged students are in smaller classes so that they receive more individual attention. At the school level, therefore, the observed relationship between class size and student achievement is often positive (suggesting that students in larger classes perform better than students in smaller classes). At higher aggregated levels of education systems, the relationship between student achievement and class size is further confounded by factors such as the socio-economic intake of schools or by factors relating to the learning culture in different countries. Past analyses which have relied on macro-level data alone have therefore sometimes led to misleading conclusions.

Outcomes, policy levers and antecedents

The second dimension in the organising framework further groups the indicators at each of these levels:

- **Outputs and outcomes** groups together indicators on the observed outputs of education systems, and those related to the impact of knowledge and skills for individuals, societies and economies.

- **Policy levers and contexts** groups together activities seeking information on the policy levers or circumstances which shape the outputs and outcomes at each level.

- **Antecedents and constraints** groups together the factors that define or constrain policy. It should be noted that the antecedents or constraints are usually specific to a given level of the education system. Antecedents at a lower level of the system may well be policy levers at a higher level. For teachers and students in a school, for example, teacher qualifications are a given constraint while, at the level of the education system, professional development of teachers is a key policy lever.

Policy issues

Each of the resulting cells in the framework can then be used to address a variety of issues from different policy perspectives. For the purpose of this framework, policy perspectives are grouped into the following three classes which constitute the third dimension in the organising framework:

- **quality** of educational outcomes and educational provision
- **equality** of educational outcomes and equity in educational opportunities
- **adequacy** and effectiveness of resource management.

In addition to the three dimensions discussed here, time offers a further dimension. Presenting trend data allows dynamic aspects in the development of education systems to be modelled as well.

2.3 Overview of current regular data collections and data sources

The data collections described below cover only the regular data collections conducted by the INES programme to develop the indicators presented in this handbook. The programme makes use of data available from other sources and from ad hoc surveys which are occasionally carried out by subsidiary groups and bodies but these are not listed here.

All submitted questionnaires are subject to rigorous scrutiny by statisticians in the INES team, checking year-on-year consistency of the data, cross-checking between tables and raising queries with countries as necessary. Automated verification checks in the questionnaires also facilitate the quality checking of the data and can often result in the resubmission of data. Please see Chapter 6 for more information.

Joint data collection by the OECD, UNESCO and Eurostat (UOE data collection)

The "UOE data collection" managed by the INES Working Party is the annual collection of data on education systems which is conducted jointly between the OECD, the UNESCO Institute for Statistics (UIS), and Eurostat and has been carried out as a joint exercise in its current form since 1993. It is a collection of aggregate national data comprising some 25 electronic questionnaires (Excel workbooks) covering student enrolments (9 questionnaires), student entrants (4), graduates (3), personnel (3), finance (3), class sizes (2) and general population (1). Countries' ISCED mappings, which map national educational programmes to the ISCED framework, form an important supplement to the UOE data collection.

The questionnaires are completed by the statistical staff in each country using the data available to them nationally.

The data requests are issued around the end of June each year. Data on students, personnel, classes, and graduates are collected for the most recently completed school year; the finance data are collected for the last but one complete financial year (to enable out-turn data to be available). Returns are due between September and November.

Advice and guidance are provided to data providers through the "UOE Manual" or *UOE Data Collection on Formal Education, Manual on Concepts, Definitions and Classifications*, (UNESCO Institute for Statistics, OECD and Eurostat, 2016) which is revised regularly when necessary and is consistent with the concepts, definitions and classifications described in this handbook.

Countries submit their completed questionnaires jointly to the OECD, Eurostat and UNESCO. For federal states (e.g. Belgium), the data is collected by the different communities and then jointly presented to the OECD and other partners. The three organisations co-operate over cleaning the data and reviewing new submissions following corrections, to ensure efficiency in the data collection and management process. According to European regulation, participation in data collections by European Member States is compulsory.

Data collections by the NESLI Network

The NESLI Network administers two annual data collections, one on teachers' salaries and working time, and one on instruction time. NESLI has developed other non-periodical data collections which are not covered in this handbook.

From 1991 until 2013 the network collected annual data through its Teachers and the Curriculum survey. Data were collected through electronic (Excel) questionnaires and covered: compulsory and non-compulsory intended instruction time for students, teachers' working time and teaching time, and annual statutory teacher compensation. The data collected related more to the policies that applied in each country than the actual activity. Thus, for example, figures on teachers' working time reflected what was laid down in regulations rather a measure of actual working time.

Since 2014, the Teachers and the Curriculum survey has been split into two different data collections.

First, the Eurydice network and the OECD (NESLI Network) jointly collect data on instruction time. As both organisations were collecting data on instruction time, they developed a common tool aimed at simplifying work at national level and avoiding overlaps and inconsistencies. This joint data collection gathers information on intended instruction time in compulsory education from the first year of primary education to the end of full-time compulsory education for all students. In grades where vocational and general programmes co-exist, it only collects data for the general programmes. It does not include pre-primary education programmes, even if they are compulsory. For each grade, it gathers the number of hours of instruction as well as non-compulsory instruction time. The data requested relate to the policies

that apply in each country in the year in question. The tool also collects data on actual instruction time in the different compulsory subjects, and qualitative information on the organisation of the school day.

Second, the NESLI Network also collects information on teachers' salaries and working time through a specific NESLI data collection covering full-time classroom teachers in public institutions at pre-primary, primary, lower secondary and upper secondary levels. At lower and upper secondary levels, the survey focuses on general programmes, meaning teachers with teaching responsibilities in vocational programmes are excluded from the scope of the survey. For each level of education, the survey collects teachers' statutory and actual teaching and working time and their statutory and actual salaries. It collects statutory salaries at four stages of teachers' careers (starting teachers, teachers with 10 and 15 years of experience, and teachers at the top of the salary scale), and for teachers with different levels of qualifications (distinguishing between minimum, typical and maximum qualification levels). It also collects criteria for additional payments in public institutions, including remuneration for tasks performed by teachers.

For both these annual data collections, experts in each country fill in electronic (Excel) questionnaires, making reference to the various laws and regulations that are in place nationally. The two data requests are revised to improve them or to collect additional information. They are issued in October each year for return by mid-December. The submitted questionnaires and related indicators are subject to rigorous scrutiny, requiring liaison with the countries involved, before the validated data are published.

Data collections by the LSO Network

The Annual Labour Statistics data request compiles two data collections: on the educational attainment and labour-market status of 25-64 year-olds, and on the transition from education to work for 15-29 year-olds. The data request is conducted by the OECD Secretariat in collaboration with the OECD Directorate for Employment, Labour and Social Affairs (ELS) in February/March each year.

Both data collections are derived from national labour force surveys.

For the first collection, countries' national statistical offices provide data on employment, unemployment and population by national educational attainment categories, gender and age groups. They are mapped onto ISCED 2011 levels of attainment using the agreed mapping from national categories to the ISCED 2011 standardised levels of attainment, which the LSO Network has established in consultation with country representatives. International Labour Organization (ILO) guidelines and definitions of employment and unemployment are used for reporting work status.

The second data collection covers the transition from education to work for 15-29 year-olds. The data are collected with a reference period in the early part of the calendar year, usually the first quarter. Countries report education and work status for each of three 5-year age groups by gender and educational level attained. Education refers to formal education only. The questionnaire also includes information on enrolment in work-study programmes. Some other variables are collected on a periodical basis (not every year), such as the number of hours worked, duration of unemployment or for the 18-24 age group.

Another annual data collection is the one on education and earnings. It collects data on earnings by attainment level and gender. Data are derived from national labour force surveys and other surveys, such as the European Survey on Income and Living Conditions (EU-SILC). It is conducted by the OECD Secretariat in October/November each year.

Countries submit their completed questionnaires to the OECD. In addition to these direct data submissions, the OECD also uses data from Eurostat, the ILO and UIS in order to fill gaps. Countries as well as the four international organisations, CEDEFOP, Eurostat, ILO and UIS, are contributing to the further development of the LSO data collections.

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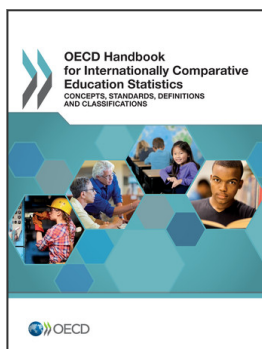
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