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.

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 (OECD, 1992[1]) 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, (OECD/Eurostat/UNESCO Institute for Statistics, 2015[2])) 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 (OECD, 2004[3]) (OECD, 2017[4]). 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, how education and learning systems operate and evolve, and the returns to investments in education. They are organised thematically, each accompanied by information on the policy context and interpretation of the data.

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 types of issues they address, and examines contextual factors that influence policy (Figure 2.1).

In addition to these dimensions, the time perspective makes it possible to visualise dynamic aspects of the development of education systems.
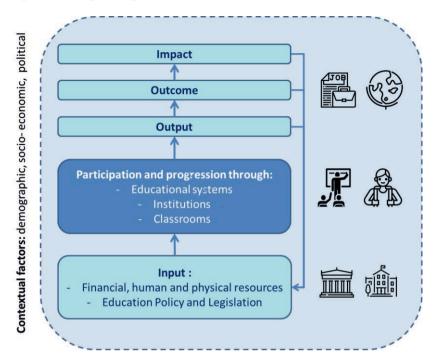
Figure 2.1. Organising framework of indicators in Education at a Glance

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 (OECD/NCES, 2017[5]). 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 first dimension of the organising framework distinguishes the three levels of actors in education systems:

- education systems as a whole

- providers of educational services (institutions, schools), as well as the instructional setting within those institutions (classrooms, teachers)

- individual participants in education and learning, the students. These can be either children or young adults undergoing initial schooling and training or adults pursuing lifelong learning programmes.

Indicator groups

The second dimension of the organising framework further groups the indicators into three categories:

- *Indicators on the output, outcomes and impact of education systems*: Output indicators analyse the characteristics of those exiting the system, such as their educational attainment. Outcome indicators examine the direct effect of the output of education systems, such as the employment and earning benefits of pursuing

higher education. Impact indicators analyse the long-term indirect effect of the outcomes, such as knowledge and skills acquired, contributions to economic growth and societal well-being, and social cohesion and equity.

- *Indicators on the participation and progression within education entities*: These indicators assess the likelihood of students accessing, enrolling in, and completing different levels of education, as well as the various pathways followed between types of programmes and across education levels.

- *Indicators on the input into education systems or the learning environment*: These indicators provide information on the policy levers that shape the participation, progression, outputs and outcomes at each level. Such policy levers relate to the resources invested in education, including financial, human (such as teachers and other school staff), or physical resources (such as buildings and infrastructure). They also relate to policy choices regarding the instructional setting of classrooms, pedagogical content and delivery of the curriculum. Finally, they analyse the organisation of schools and education systems, including governance, autonomy, and specific policies to regulate participation of students in certain programmes.

2.2.2. *Contextual factors that influence policy*

Policy levers typically have antecedents, external factors that define or constrain policy but are not directly connected to the policy topic at hand. Demographic, socio-economic and political factors are all important national characteristics to take into account when interpreting indicators. The recent financial crisis, for example, had a significant impact on public funds available to education.

The characteristics of the students themselves, such as their gender, age, socio-economic status, or cultural background, are also important contextual factors that influence the outcomes of education policy.

2.2.3. *Indicator analysis using the framework*

This versatile framework can be used to understand the operation and functioning of any educational entity, from an education system as a whole to a specific level of education or programme, or even a smaller entity, such as a classroom.

This versatility is important because many features of education systems have varying impacts at different levels of the system. 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 interactions with teachers. At the class or school level, however, weaker or disadvantaged students are often intentionally grouped and placed 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 levels of aggregation, the relationship between student achievement and class size is further confounded, by the socio-economic intake of individual schools or by factors relating to the learning culture in different countries. Therefore, to interpret the indicators, it is important to fully understand the relationships between them.

Analysis of each element of the framework and the interplay between them contribute to understanding a variety of policy perspectives:

- quality of education outcomes and education opportunities

- equality of education outcomes and equity in education opportunities

- adequacy, effectiveness and efficiency of resources invested in education

- relevance of education policy measures to improve education outcomes.

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.

2.3.1. 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 is provided to data providers through the "UOE Manual" or *UOE Data Collection on Formal Education, Manual on Concepts, Definitions and Classifications,* (UNESCO-UIS/OECD/EUROSTAT, 2016[6]) 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 (UNESCO-UIS/OECD/EUROSTAT, 2013[7]). For federal states (e.g. Belgium), the data are 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.

2.3.2. Data collections by the NESLI Network

The NESLI Network administers three annual data collections on 1) the teachers' and school heads' salaries; 2) teachers' working time; and 3) instruction time for students. 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.

In 2014 the Teachers and the Curriculum survey was split into two different data collections: instruction time, and teachers' salaries and working time. 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.

The NESLI Network also collected 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. In 2017, this data collection was further split into two different collections, one on teachers' and school heads' salaries, and one on working time. As both Eurydice and the NESLI Network were collecting data on teachers' salaries, but the Eurydice data collection also covered the salaries of school heads, they again developed a common tool aimed at simplifying work at the national level and avoiding overlaps and inconsistencies. This survey has been designed to meet the data needs of the two organisations. As a result it differs from the data collections administered separately by Eurydice and the OECD in previous years, and the joint data collection covers the salaries of teachers and school heads for all countries. Second, the NESLI Network also collects information on teachers' 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.

For each level of education, the surveys collect teachers' statutory and actual teaching and working time and their statutory and actual salaries. They collect 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, most prevalent and maximum qualification levels). They also collect criteria for additional payments in public institutions, including remuneration for tasks performed by teachers.

For these three 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 data 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.

2.3.3. 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.
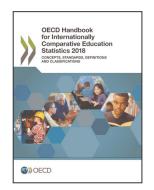
Countries submit their completed questionnaires to the OECD. In addition to these direct data submissions, the OECD also uses data from Eurostat, the ILO and UIS in order to fill gaps. Countries as well as the four international organisations, CEDEFOP, Eurostat, ILO and UIS, are contributing to the further development of the LSO data collections.

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