Employment by education

Introduction

In all countries, human resources represent, directly or indirectly, the most valuable and productive resource; countries traditionally depend on the health, strength and basic skills of their workers to produce goods and services for consumption and trade. The advance of complex organizations and knowledge requirements, as well as the introduction of sophisticated machinery and technology, means that economic growth and improvements in welfare increasingly depend on the degree of literacy and educational attainment of the total population. The population’s predisposition to acquire such skills can be enhanced by experience, informal and formal education, and training.

Information on the employed population by level of educational attainment provides insights into the human capital dimension of employment with potential implications for both employment and education policy.

ILOSTAT contains statistics from national sources on employment by level of educational attainment, also disaggregated by sex and age. Statistics are available using both aggregate and detailed categories of educational attainment.

Concepts and definitions

Employment comprises all persons of working age who during a specified brief period, such as one week or one day, were in the following categories: a) paid employment (whether at work or with a job but not at work); or b) self-employment (whether at work or with an enterprise but not at work).

The working-age population is the population above the legal working age, but for statistical purposes it comprises all persons above a specified minimum age threshold for which an inquiry on economic activity is made. To favour international comparability, the working-age population is often defined as all persons aged 15 and older, but this may vary from country to country based on national laws and practices (some countries also use an upper age limit).

Data presented by level of education is based on the International Standard Classification of Education (ISCED). The ISCED was designed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the early 1970s to serve as an instrument suitable for assembling, compiling and presenting comparable indicators and statistics of education, both within countries and internationally. The original version of ISCED (ISCED-76) classified educational programmes by their content along two main axes: levels of education and fields of education. The cross-classification variables were maintained in the revised ISCED-97; however, the rules and criteria for allocating programmes to a level of education were clarified and tightened, and the fields of education were further elaborated. In 2011, a new classification ISCED 2011 was introduced; however, reporting according to ISCED-11 did not start until 2014.

Statistics on employment by level of educational attainment are presented in ILOSTAT according to both the categories of the latest version of the ISCED available and aggregate categories, based on the following correspondence table:

### Aggregate Levels of Education

<table>
<thead>
<tr>
<th>Aggregate Levels of Education</th>
<th>ISCED-11</th>
<th>ISCED-97</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than basic</td>
<td>X. No schooling</td>
<td>X. No schooling</td>
</tr>
<tr>
<td></td>
<td>0. Early childhood education</td>
<td>0. Pre-primary education</td>
</tr>
<tr>
<td>Basic</td>
<td>1. Primary education</td>
<td>1. Primary education or first stage of basic education</td>
</tr>
<tr>
<td></td>
<td>2. Lower secondary education</td>
<td>2. Lower secondary or second stage of basic education</td>
</tr>
<tr>
<td>Advanced</td>
<td>5. Short-cycle tertiary education</td>
<td>5. First stage of tertiary education (not leading directly to an advanced research qualification)</td>
</tr>
<tr>
<td></td>
<td>6. Bachelor’s or equivalent level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Master’s or equivalent level</td>
<td>6. Second stage of tertiary education (leading to an advanced research qualification)</td>
</tr>
<tr>
<td></td>
<td>8. Doctoral or equivalent level</td>
<td></td>
</tr>
<tr>
<td>Level not stated</td>
<td>9. Not elsewhere classified</td>
<td>? Level not stated</td>
</tr>
</tbody>
</table>

### Recommended sources

Labour force surveys are typically the preferred source of statistics on employment by educational attainment, since they allow to gather information on both the labour market situation of individuals and their level of educational attainment. Such surveys can be designed to cover virtually the entire non-institutional population of a given country, all branches of economic activity, all sectors of the economy and all categories of workers, including the self-employed, contributing family workers, casual workers and multiple jobholders. In addition, such surveys generally provide an opportunity for the simultaneous measurement of the employed, the unemployed and persons outside the labour force (and thus, the working-age population) in a coherent framework.

Other types of household surveys and population censuses could also be used as sources of data on employment by educational attainment. The information obtained from such sources may however be less reliable since they do not typically allow for detailed probing on the labour market activities of the respondents.

### Interpretation and use of the indicator

Although the natural endowments of the labour force remain relevant, continuing economic and technological change means that the bulk of human capital is now acquired, not only through initial education and training, but increasingly through adult education and enterprise or individual worker training, within the perspective of lifelong learning and career management. Unfortunately, quantitative data on lifelong learning, and indicators that monitor developments in the acquisition of knowledge and skills beyond formal education, are sparse. Statistics on levels of educational...
attainment, therefore, remain the best available indicators of labour force skill levels to date. These are important determinants of a country’s capacity to compete successfully and sustainably in world markets and to make efficient use of rapid technological advances. They also should affect the employability of workers.

The ability to examine education levels in relation to employment is also useful for policy formulation, as well as for a wide range of economic, social and labour market analyses. Statistics on levels and trends in educational attainment of the employed can: (a) provide an indication of the capacity of countries to achieve important social and economic goals; (b) give insights into the broad skill structure of the employed population; (c) highlight the need to promote investments in education for different population groups; (d) support analysis of the influence of skill levels on economic outcomes and the success of different policies in raising the educational level of the workforce; (e) give an indication of the degree of inequality in the distribution of education resources between groups of the population, particularly between men and women, and within and between countries; and (f) provide an indication of the skills of the existing employed population, with a view to discovering untapped potential.

**Limitations**

A number of factors can limit the comparability of statistics on employment by level of educational attainment between countries or over time.

Comparability of employment statistics across countries is affected most significantly by variations in the definitions used for the employment figures. Perhaps the biggest differences result from age coverage, such as the lower and upper bounds for labour force activity. Estimates of employment are also likely to vary according to whether members of the armed forces are included.

Another area with scope for measurement differences has to do with the national treatment of particular groups of workers. The international definition of employment calls for inclusion of all persons who worked for at least one hour during the reference period.³ Workers could be in paid employment or in self-employment, including in less obvious forms of work, some of which are dealt with in detail in the resolution adopted by the 19th ICLS, such as unpaid family work, apprenticeship or non-market production. The majority of exceptions to coverage of all persons employed in a labour force survey have to do with slight national variations to the international recommendation applicable to the alternate employment statuses. For example, some countries measure persons employed in paid employment only and some countries measure only “all persons engaged”, meaning paid employees plus working proprietors who receive some remuneration based on corporate shares. Other possible variations to the “norms” pertaining to measurement of total employment include hours limits (beyond one hour) placed on contributing family members before for inclusion in employment.⁴

Comparisons can also be problematic when the frequency of data collection varies widely. The

---

³ The application of the one-hour limit for classification of employment in the international labour force framework is not without its detractors. The main argument is that classifying persons who engaged in economic activity for only one hour a week as employed, alongside persons working 50 hours per week, leads to a gross overestimation of labour utility. Readers who are interested to find out more on the topic of measuring labour underutilization may refer to ILO: “Beyond unemployment: Measurement of other forms of labour underutilization”, Room Document 13, 18th International Conference of Labour Statisticians, Working group on Labour underutilization, Geneva, 24 November – 5 December 2008; http://www.ilo.org/global/statistics-and-databases/meetings-and-events/international-conference-of-labour-statisticians/WCMS_100652/lang--en/index.htm.

⁴ Such exceptions are noted in the footnotes and/or metadata fields in ILOSTAT’s data tables. The higher minimum hours used for contributing family workers is in keeping with an older international standard adopted by the International Conference of Labour Statisticians in 1954. According to the 1954 ICLS, contributing family workers were required to have worked at least one-third of normal working hours to be classified as employed. The special treatment was abandoned at the 1982 ICLS.
range of information collection can run from one month to 12 months in a year. Given the fact that
seasonality of various kinds is undoubtedly present in all countries, employment figures can vary for
this reason alone. Also, changes in the level of employment can occur throughout the year, but this
can be obscured when fewer observations are available.

The way in which employed individuals are assigned to educational levels can also severely
limit the feasibility of cross-country comparisons. Many countries have difficulty establishing links
between their national classification and ISCED, especially with respect to technical or professional
training programmes, short-term programmes and adult-oriented programmes (ranging around levels
3, 4 and 5 of ISCED-97 and ISCED-11). In numerous situations, ISCED classifications are not
strictly adhered to; a country may choose to group together some ISCED categories. It is necessary
to pay close attention to the notes in order to ascertain the actual distribution of education levels
before making comparisons.

An issue that affects several countries in the European Union subgroup of the Developed
Economies originates from the way in which those who have received their highest level of
education in apprenticeship systems are classified. The classification of apprenticeship in the
“secondary” level – despite the fact that this involves one or more years of study and training beyond
the conventional length of secondary schooling in other countries – can lower the reported
proportion of the labour force or population with tertiary education, compared with countries where
the vocational training is organized differently. This classification issue substantially holds down the
levels of tertiary education reported by Austria and Germany, for instance, where the participation of
young people in the apprenticeship system is widespread.

There is also the potential for further confusion as to how a person’s educational level is to be
defined. Ideally, when making cross-country comparisons, all data should refer to the highest level of
education completed, rather than the level in which the person is currently enrolled, or the level
begun, but not successfully completed. However, because data are usually derived from household
surveys, the actual definition ultimately used will inevitably depend on each respondent’s own
interpretation.