



**Employability in Programme Development:** Establishing a labour market to higher education feedback loop drawing on local labour market intelligence

## **ERASMUS+: Employability in Programme Development (EPD) Project**

Erasmus+ Programme, Key Action 2: Strategic Partnerships (agreement number 2020-1-UK01-KA203-079171)

**Intellectual Output:** IO1

**Intellectual Output title:** Understanding skills gaps and employability for HE professionals and stakeholders

**Document title:** List of indicators and key published sources on skills and employability

**Contributing authors:** Stefano Fusaro<sup>§</sup> & Rosario Scandurra<sup>§</sup>

**Author affiliation:** §Universitat Autònoma de Barcelona (UAB)



Co-funded by the  
Erasmus+ Programme  
of the European Union

## Data and Indicators on Skills and Employability of Higher Education Graduates

Stefano Fusaro, Rosario Scandurra  
 Department of Sociology  
 Universitat Autònoma de Barcelona

### 1. Introduction

This document describes the source of available information at local level and discuss the existing gap and presents a list of indicators on the labour market and skill environment. We present a description of the main data sources available that provide information on employability of young graduates at local level. We will provide an overview of the *harmonised* sources of data (that is, those that provide information on each region of the participating HEIs), as well as on the *local* one (that, conversely, provide information on some specific HEI). The different data sources are organized based on the geographical scope for which information are available, from NUTS3<sup>1</sup> to country-level.

### 2. Harmonised data sources

We initially present an overview of the sources of data that provide information for each participating HEI, which are summarised in table 1.

Table 1: Overview of the harmonised data sources

Acronym	Title	Organization	Sample	Geographical Scope	Period	Main Limitations
EU-LFS	Labour Force Survey (European)	Eurostat	15-64	NUTS2	1983-2019	- No information on wages. - Not specific for education outcomes.
Eurostat	Regional statistics	Eurostat		NUTS2-NUTS3	1990-2020	- Aggregate information
OECD	OECD Regions and Cities	OECD	25-64	NUTS2	1990-2020	- Aggregate information.
OVATE	Skills-OVATE	CEDEFOP		NUTS2	2020Q2 – 2021Q1	- Very aggregated information; - Short period covered.
ECS	European Company Survey	Eurofound		Country	2004-2009-2013-2019	- Country level information.
ESJ	European skills and jobs survey (ESJS)	CEDEFOP	15-64	Country	2014-2021	- Country level information.
Survey of Adult Skills (PIAAC)	OECD	OECD	15-64	Country	2012	- Country level information. - Only data on England in UK

As for the NUTS 2 level, the first data source is the European Union Labour Force Survey (EU-LFS), which is conducted for the all the Member States, as well as for 4 candidates' countries and for 3 countries of the European Free Trade Association (EFTA). As in the case of the Spanish LFS, the EU-LFS typically reports information on the labour force of the countries considered, with a particular focus on demographic background, employment status, job-related characteristics and education and training. The different EU-LFS files cover the period 1983-2019.

The second source of data that provide information for the all the Member States, as well as for 4 candidates' countries and for 3 countries of the European Free Trade Association (EFTA) are the regional statistics of Eurostat, which provide information on demography, education, economic accounts, labour market, etc.

Another interesting data source that provides information up to the NUTS2 level is the regional database provided by the Organization for the Economic Cooperation and Development (OECD), also known as "OECD Regions and Cities". This source reports information on the education and labour market dynamics at the local level, with a particular focus on (i) the educational attainment of the local population by age group and gender (25-34. 25-64), (ii) the enrolment rate

<sup>1</sup> The word "NUTS" stands for Nomenclature of territorial Units for Statistics and is a hierarchical system used to divide the territories of the different European countries with the purpose of (i) collecting data; (ii) carrying out socio economic analysis; (iii) framing of EU regional policies (such as the Cohesion Policy). There are three NUTS levels: NUTS1 which corresponds to major socio-economic regions, NUTS2 that consists in the set of basic regions for the application of regional policies, and NUTS3 that is composed by small regions for specific diagnoses. For more detail, see <https://ec.europa.eu/eurostat/web/nuts/background>.

by age groups, (iii) the employment rate by education levels and age groups, (iv) the participation in formal and non-formal education and learning, (iv) the number of early leavers from education and NEET. Such information is available for the population aged 25-64 and cover the period 1990-2020.

The final source of information at the NUTS2 level of disaggregation is the Skills-OVATE, produced by Cedefop. This is an online tool based on artificial intelligence (AI) that offers detailed information on the jobs and skills that employers demand most. It is based on an extremely large number of online job advertisements (OJAs) for 28 European countries, collected from thousands of sources (e.g., private job portals, public employment service portals, recruitment agencies, online newspapers, and corporate websites) for the period 2020-2021.

Finally, there exists three main data sources at country level with the objective to assess comparatively adult skills and skills use in the workplace. The first is the European Company Survey (ECS), conducted by the European Foundation for the Improvements of Living and Working Conditions (Eurofound). This survey provides information on different aspects, such as work organization, human resources management, skills use, skills strategies, digitalization, direct employee participation and social dialogue. The survey considers the population of managers and employees from establishments EU-based with 10 or more employees, and is conducted for the years 2004, 2009, 2013, 2019.

The second is the European skills and jobs survey (ESJS), conducted by the Cedefop. This is a computer-based survey covering most of European countries. Beside basic socio-demographic and job characteristics, this survey collects information on job-skill requirements (e.g., literacy, numeracy, digital, analytical, manual and interpersonal skills), skill mismatches (i.e., vertical, horizontal, mismatches in specific skills, skill gaps and deficits, and skill mismatch transitions), initial and continuing vocational education and training participation and labour market outcomes (e.g. wages, job insecurity, job satisfaction). The first wave of the ESJS was carried out in 2014 in all EU27 Member States and UK and surveyed about 49,000 adult employees, while the second was carried out in 2021 and surveyed about 45,000 adult employees from all EU Member States plus Norway and Iceland.

The third is the so-called Survey of Adult Skills, which belong to the *Programme for the International Assessment of Adult Competencies* (PIAAC). This survey is conducted by the OECD covering over 40 countries and is aimed at measuring: (i) adults' proficiency in key information-processing skills, such as literacy, numeracy and problem solving; (ii) the extent to which adults use their skills in different daily-life contexts (at home, in the workplace, and in the wider community); (iii) the key cognitive and workplace skills needed for individuals to participate in society and for economies to prosper. The first PIAAC survey was conducted in 2012 and additional rounds were performed, while another additional round is planned to be performed in 2022. Moreover, different countries such as Denmark, Germany have linked PIAAC data with national surveys, allowing for longitudinal match with PIAAC data.

### 3. Local data sources

Table 2 presents an overview of the main sources of data that provide information of the Spanish and Catalan context.

Table 2: Overview of local data sources

Acronym	Title	Organization	Sample	Geographical Scope	Period	Main Limitations
LFS	Labor Force Survey (Spanish)	INE/IPUMS	0-99+	NUTS3	2005-2019 (quarterly)	- No information on wages; - No specific for education outcomes.
Census	Population Censuses	INE/IPUMS	0-99+	NUTS3	1981-2011 (Decadal)	- No information on wages; - Only decadal-level information.
IL-AQU	Estudi d'Inserció Laboral	AQU	0-99+	NUTS3	2001-2020 (3-year interval)	- Not possible to directly identify university/HEI.
Ocupadors-AQU	Enquesta ocupadors	AQU		NUTS3	2014-2018	- Extremely small sample sizes. - Limited number of sectors
Talent AQU	Catalan Talent Observatory	AQU		NUTS3	Last 12 months	- Short time-series (only last 12 months).
CLEM	Business Climate Survey	Idescat		NUTS3	2009Q1-2021Q2	- No specific for education outcomes but focused on the economic performance of Catalan firms.

The most important source of information is represented by the Spanish Labour Force Survey (LFS) which provides information on different aspects of the labour force of the country under analysis, such as employment status (employed vs unemployed), type of occupation, industry, type of contract, as well as education-related information. The LFS is conducted by the Spanish national institute for statistics (INE) on a quarterly basis. The LFS files provided by the IPUMS international record on average 160,000 individuals, which correspond to around the 0.03% of the whole Spanish population and cover the period 2005-2019.

Another source of information are the Spanish population censuses, that are available for download at the IPUMS International and INE webpage. Population censuses are conducted every 10 years and are representative of the whole population of the country considered. They provide information on different aspects, such as demographic characteristics (gender, age, marital status, etc...), nativity and birthplace (natives vs foreign-born, citizens vs non-citizens, country of birth, country of citizenship, etc...), work-related information (employment status, type of occupation, industry, type of contract, etc...), and education-related information. In the case of Spain, the available censuses are those of 1981, 1991, 2001 and 2011. The first three have a sample fraction of 0.05 and a sample size of around 2 million individuals (i.e., it represents about the 5% of the whole Spanish population). The census of 2011 has instead a sample fraction of 0.1 and records around 4 million individuals (i.e., it is representative of the 10% of the entire Spanish population).

Moreover, the Catalan University Quality Assurance Agency (AQU) produce three main studies on the topic. The first is a set of surveys that report information on the school-to-work transition of the population of graduates from Catalan universities and higher education institutions (“Estudi d’Inserció Laboral”, or IL data). More in detail, besides basic demographic information such as gender, age or nativity status, these surveys report information on (i) the educational attainments (average grade, field of study, university/HEI, etc.), and (ii) the labour market performances (employment status, type of contract, length of the contract, time spent looking for the current job position, wage earned, etc). There are three available surveys: one for people with bachelor degrees, one for people with master degrees, and finally, one for people with doctoral degrees. The first one has a sample of around 94,000 individuals, and is conducted every 3 years, over the period 2001-2020<sup>2</sup>. In the case of master degree, the survey is conducted on a sample of around 25,000 individuals, and again is conducted every 3 years, although over a shorter the period of time: 2014-2020. Finally, the survey on doctoral degree is conducted over a sample of around 7,000, at three-years cadence covering the period 2008-2020. The IL survey, promoted by the Catalan public and private universities, as well as 37 affiliated and partner schools and institutes and the Ministry of Education, is one of the most representative and important in Europe, and allows to gather information on graduates’ employability.

The second AQU data source is another set of surveys that report information about the perception of employers about the adequacy of the training of the newly hired employees, who have recently graduated from Catalan universities and HEI (these are defined the “ocupadors” data). Besides basic information on the workplace (e.g. number of workers, year in which the activity started, etc...) the surveys typically report information on (i) the degree of satisfaction of the employers about the skills of the employees, and (ii) the contracting process (like the potential difficulty to fill a vacancy with an adequately-skilled worker). For 2014, there are three different types of surveys: one on education centers, one of health centers (divided into two sub-surveys on nurses and physicians), and one on the private sector. For 2018, the number of sectors has considerably increased: pharmacy, public administration, communication, tourism, economics and business, humanities, biosciences, design, psychology, ICT, construction, medicine, nursing, education and industrial technology.

The third data source is the Talent AQU portal, which provides information on the Catalan labour market, with a particular focus on the demand side. The portal retrieves information from generally used job-search websites (such as LinkedIn or similar) and indicates the main characteristics of the job offers in Catalonia, as well as the most required skills and abilities. This tool provides information on (i) the number of job vacancies, also distinguishing by sectors (i.e., manufacture, trade and services)<sup>3</sup>, (ii) an overview of skills more demanded in the Catalan labour market, and finally, (iii) the occupation of the month. In terms of the period covered, the portal only reports information on the last 12 months.

Finally, the last data source that provides information up to the NUTS3 level is the Business Climate Survey (CLEM), which is somewhat complementary to the Talent portal of AQU. Alongside the basic questions to identify the situation and evolution of the business in a given period, this survey (i) collects the opinions of company representatives with activities in Catalonia, regarding the evolution and expectations for a set of variables relating to the economic development of their company, and (ii) provides interesting information on the entrepreneurial environment. In other words, these statistics allow the detection of some change in the trends of the business cycle. This survey is conducted on a quarterly basis, over the period 2009-2021.

---

<sup>2</sup> In other words, the survey available are those of: 2001, 2005, 2008, 2011, 2014, 2017 and 2020.

<sup>3</sup> These are obtained by analyzing the historical data of job ads published on the web.

In addition, we have explored which set of information HEIs professionals and workers used in their daily practice, using a part of the semi-structured interviews we have carried out with local stakeholders. In particular, we have interviewed 8 academics, program head managers, and employability workers of Catalan universities and we have asked for which kind of available information they used in day-to-day practice. UAB has three sources of datasets where the university stores information of firms offering extracurricular employability programs, alumni willing to apply for employability program (NEXUS<sup>4</sup>) and curricula employability internships (*prácticas*) which is generally managed by each faculty/school. For the former, generally firms or institutions made a direct contact with the university through academics or personnel contact. There is an assessment at the end of the internships where students are asked to rank their experience coupled with a firm assessment of the internee. However, as emerged through a set of in-depth interviews with academic stakeholders, there is not a process in place for updating and track local skills demand, neither established feedback with academics or head programs. However, curricula and extracurricular programs supply are not integrated in a single dataset and in practice there is little exchange of information around these two issues. We, as UAB team of the EPD project, were not able to directly access to our institutional sources and we are still in the process to have access to this data.

#### 4. Indicators

In this section we present a list of harmonised and local indicators that are supposed to provide insights on the evolution of the local labour market and skill environments. Specifically, table 3 presents a list of indicators for which information for all the participating HEIs regions is available. Conversely, table 4 presents a list of indicators which are mostly based on the AQU data and therefore are only specific to the Catalan context.

##### 4.1. Harmonised indicators

Table 3: List of harmonised indicators

Indicator	Definition	Source
Enrolment rate by age	Number of students of a particular age group enrolled in an education level divided by the size of the population of that age group. (Generally, figures are based on head counts and do not distinguish between full-time and part-time enrolment)	OECD Regions & Cities
Participation rate in education and training (last 4 weeks)	Percentage of population in a given age group who participate in one or more learning programmes	EU-LFS, Eurostat and OECD Regions & Cities
Share of population age 25-34 by educational attainment	Number of people of a particular age group with a specific education level divided by the size of the population of that age group	EU-LFS, Eurostat and OECD Regions & Cities
Number of persons with tertiary education employed in science or technology (as % of the labour force)	Number of people with tertiary education and employed in science and technology divided by the size of the labour force <sup>5</sup>	EU-LFS, Eurostat
Share of <i>NEET</i>	Percentage of population aged 18-24 who is not employed nor involved in further education or training	EU-LFS, Eurostat and OECD Regions & Cities
Early leavers from education and training	Number of persons aged 18-24 who has completed at lower-secondary education and not involved in further education or training divided by the population in the 18-24 age group.	EU-LFS, Eurostat and OECD Regions & Cities
Employment rate by age group and education level	The employment rate is the percentage of employed persons in relation to the comparative total population. Are considered employed person all individuals aged 15 or over who during the reference week performed work (even if for just one hour a week) for pay, profit or family gain.	EU-LFS, Eurostat and OECD Regions & Cities
Average number of weekly hours of work	Number of hours worked in the main job in the reference week	EU-LFS, Eurostat
Employment in technology and knowledge-intensive sectors	Percentage of persons employed in technology or knowledge-intensive sectors <sup>6</sup> in relation to the total employment	EU-LFS, Eurostat

<sup>4</sup> The portal can be found here <https://nexus.uab.es/UAB/logon.do>.

<sup>5</sup> The labour force, or currently active population, comprises all persons who fulfil the requirements for inclusion among the employed (civilian employment plus the armed forces) or the unemployed. The employed are defined as those who work for pay or profit for at least one hour a week, or who have a job but are temporarily not at work due to illness, leave or industrial action. The armed forces cover personnel from the metropolitan territory drawn from the total available labour force who served in the armed forces during the period under consideration, whether stationed in the metropolitan territory or elsewhere. The unemployed are defined as people without work but actively seeking employment and currently available to start work. This indicator is seasonally adjusted and it is measured in persons.

<sup>6</sup> For more details on the list of knowledge-intensive sectors, see [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Knowledge-intensive\\_services\\_\(KIS\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Knowledge-intensive_services_(KIS))

Share employment by sector by age group and education level	Percentage of persons employed in each sector in relation to the total employment	EU-LFS, Eurostat
Job vacancies in the last 12 months (also by region/province and/or by sector)	Paid post that is newly created, unoccupied, or about to become vacant: (i) for which the employer is taking active steps and is prepared to take further steps to find a suitable candidate from outside the enterprise concerned; and (ii) which the employer intends to fill either immediately or within a specific period of time.	Eurostat
Unemployment rate by age group and education level	The unemployment rate is the percentage of unemployed persons as a percentage of the labour force. Are defined as unemployed all persons aged 15-74 that did not work in the reference week and (i) are available to start work within the next two weeks (or has already found a job to start within the next three months); and (ii) have actively sought employment during the last four weeks.	EU-LFS, Eurostat and OECD Regions & Cities
Long term unemployment rate by age group and education level	The long-term unemployment rate is the percentage of people out of work and actively searching for a job position for at least one year percentage of the labour force	EU-LFS, Eurostat and OECD Regions & Cities
Unemployment duration	Average number of weeks needed to find the current job position	EU-LFS
Share full/part-time employment	Percentage of workers with a full- or part-time contract in relation to the total employment	EU-LFS
Share workers with permanent/temporary contract	Percentage of workers with a permanent- or temporary contract in relation to the total employment	EU-LFS

## 4.2. Local indicators

Table 4: List of local indicators

Indicator	Definition	Source
Share of population with tertiary education by field of study	Number of people with tertiary education graduated from a particular field divided by the total population with tertiary education	IL-AQU
Job vacancies in the last 12 months (also by region/province and/or by sector)	Paid post that is newly created, unoccupied, or about to become vacant: (i) for which the employer is taking active steps and is prepared to take further steps to find a suitable candidate from outside the enterprise concerned; and (ii) which the employer intends to fill either immediately or within a specific period of time.	Talent AQU
Way to access first and current jobs	Percentage of graduates by type of access to the first/current job position	IL-AQU
Employment rate by field of study and educational attainment	Percentage of persons employed by field of study and education attainment	IL-AQU
Unemployment duration by field of study and education attainment	Average number of weeks needed to find the current job position by field of study and education attainment	Spanish LFS and IL-AQU
Share full/part-time employment by field of study and educational attainment	Percentage of workers with a full- or part-time contract in relation to the total employment by field of study and educational attainment	Spanish LFS and IL-AQU
Share workers with permanent/temporary contract by field of study and educational attainment	Percentage of workers with a permanent- or temporary contract in relation to the total employment by field of study and educational attainment	Spanish LFS and IL-AQU
Share employment by sector by age group and education level	Percentage of persons employed in each sector in relation to the total employment	Spanish LFS and Population Censuses
Share employment by type of occupation by age group and education level	Percentage of persons employed by type of occupation in relation to the total employment	Spanish LFS and Population Censuses
Wage distribution by field of study and educational attainment	Percentage of graduates in each wage group by field of study and educational attainment	IL-AQU
Extent of skills mismatch	Percentage of graduates who has a job related or not related with their academic background by field of study and educational attainment	IL-AQU