

A Skills Intelligence Ecosystem

To identify labour market needs and guide education and career pathways

Carmen Pagés

Professor and researcher, Faculty of Economics and Business
Director of the Skills intelligence and Labor Market Analysis Unit
Universitat Oberta de Catalunya

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The problem and the solution found

UOC is the first online university in the world and the only one in Catalan.

+97,000 STUDENTS

+133,000 GRADUATES (GENDER-NEUTRAL)

12,000 VIRTUAL CLASSROOMS

130,000 FINAL VIRTUAL EXAMS

354 TEACHING & RESEARCH STAFF (PDI) ETC (FULL-TIME EQUIVALENT)

956 MANAGEMENT STAFF

6,472 COLLABORATING TEACHING STAFF

208 RESEARCH STAFF (PI)

+50 RESEARCH GROUPS

+12 M€ RESEARCH FUNDING

Referent

It is the **first university** in Catalonia in number of **students** and the **second** in the **state**, and the **only one** in the Catalan and Spanish university system that offers education at **public prices** and in **Catalan** as an **online** university.

In the 25-26 course, UOC has enrolled **26%** of the **total** student body of the SUC (official degrees), and **44%** if equivalent offers are considered.

Inclusive

37.9% of **students** from the Catalan university system living in **rural areas** study at UOC (**18%** of % of our student body), **63.9%** of whom are women.

48% of **students** from the Catalan university system with a certified disability study at UOC* (3% of our student body), with **2,803 people**, a figure that has almost quadrupled in the last 15 years (2011-2012 course: 811).

Employable

UOC accounts for **37%** of **students** from the **top 10 STEM undergraduate degrees** and **73%** from the **top 10 STEM master's degrees** in the Catalan university system.

Furthermore, it concentrates **38%** of **new-access students** in **STEM programs** in **Catalonia** and **16%** in **Spain** (**89%** and **60%** in online STEM offers, respectively).

Lifelong

89% of UOC **students** **study and work** and **88%** **want to improve professionally**.

35% of UOC students come from **Higher Education Training Cycles (FPGS)**.



A Labour Market in Constant Change

Global/Local Challenges

Digital transformation

Adapting to a technology-driven landscape.

AI adoption

Harnessing artificial intelligence in the workplace.

Green transition

Sustainability and the 'Green' shift in industries.

Socioeconomic shift

Navigating instability and widening divides.

Demographics

Addressing the aging population and divide.

What is the Problem?

We live in a world in constant change and we ask ourselves the following questions:

WHAT ARE THE
COMPETENCIES THAT ARE
NEEDED TODAY?

WHAT DO I **NEED TO LEARN?**

WHAT DO WE HAVE **TO
TEACH?**

THE TRADITIONAL WAY OF RESPONDING DOES NOT GIVE SUFFICIENT RESPONSES.

LIMITATIONS OF TRADITIONAL METHODS



CONSULTING WITH A FEW COMPANIES

It does not give enough information or representativeness of a complex and changing market.

LIMITED CAREER GUIDANCE COUNSELORS
+ they do not have up-to-date information about what is happening in the labor market.

+ **WE NEED SCALE IN GUIDANCE**



We have almost 100,000 students



The UOC response

Create a unit within the university whose mandate is to provide **scientific knowledge** about:

- Needs for skills and jobs.
- Needs for continuous training of people
- To provide this knowledge to students/alumni, program managers and society.



UPAL: A multidisciplinary team



Carme Pagès, Director
PhD in Economics. Labour Economics



Natali Basilico,
PhD in **Economics**



Marina Muñoz
Master in **Economics**. Statistical methods.



Carles Bruguera
PhD in **Education and ICT** (e-learning)



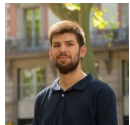
Paula Pedro
Sociologist and Master in Political Analysis.
Qualitative analysis



Gonzalo Cubillos
Master in **Public Policies and data science.**



Mitch Peters
PhD in **Education and ICT** (e-learning).
Microcredentials.

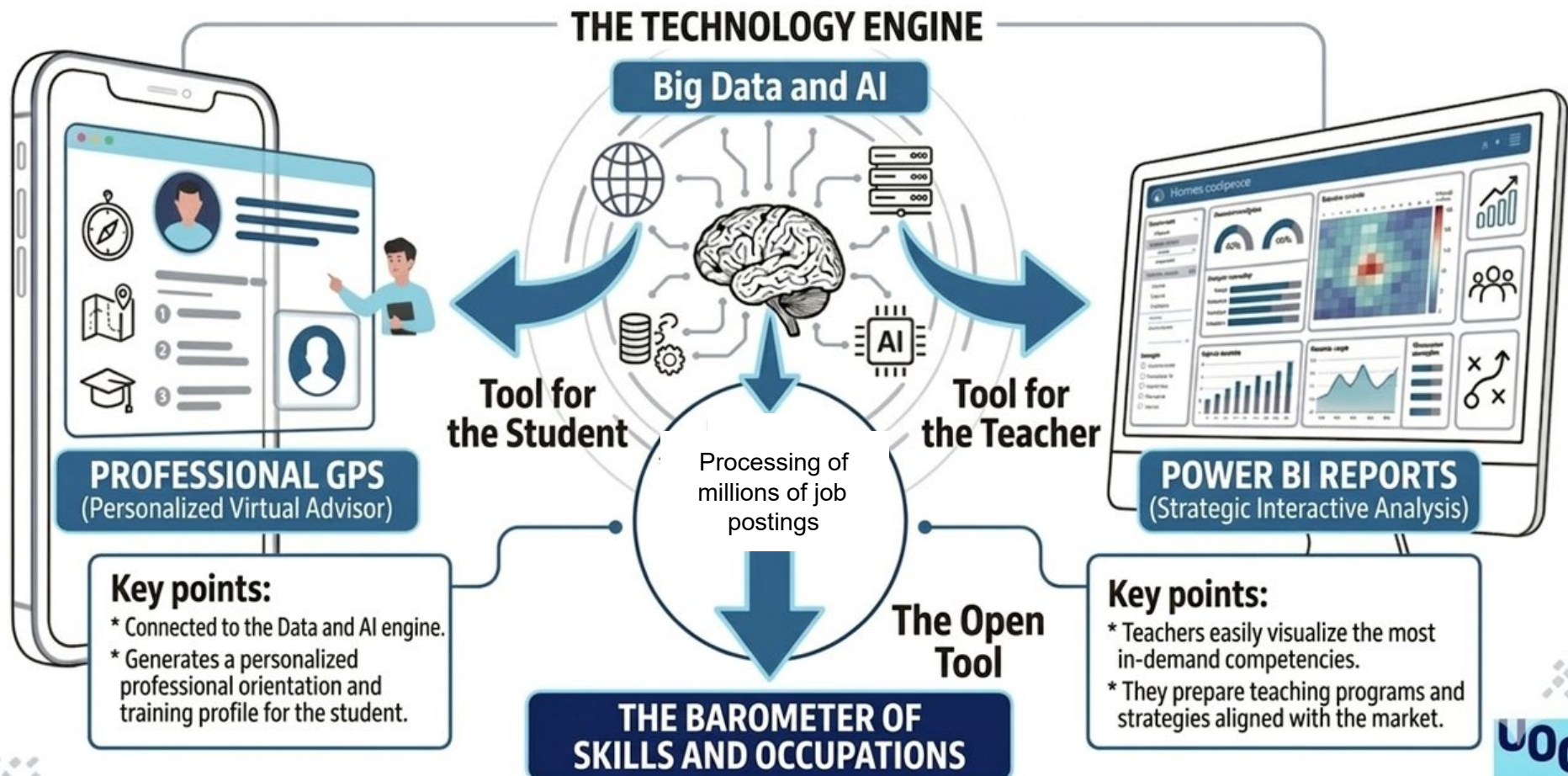


Adrià López Carrasco
Data Analyst



Rafael Sosa
PhD in **Social Sciences.**
Data Scientist.

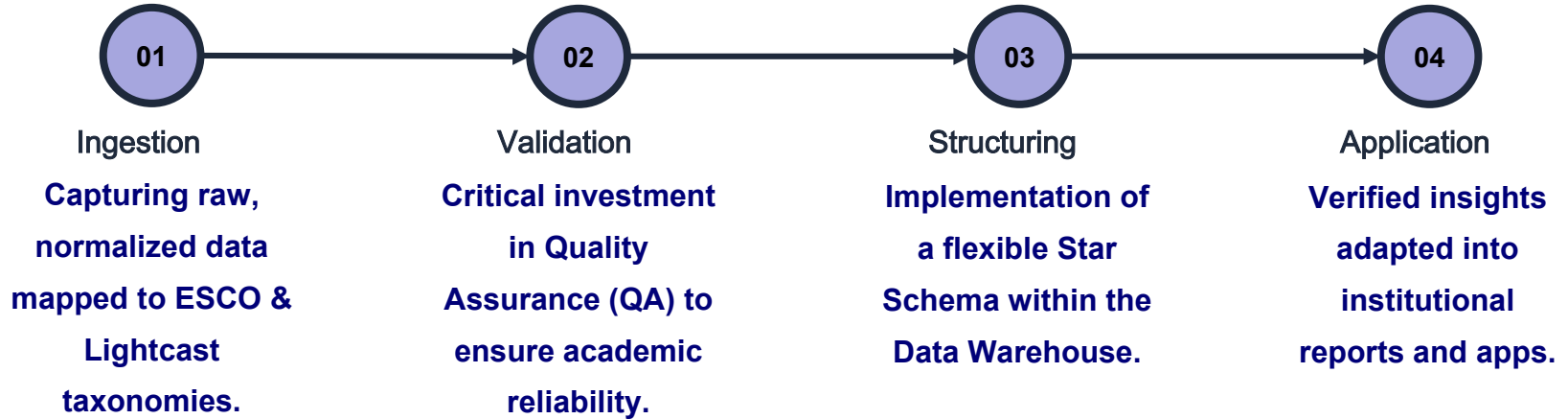
CREATION OF A SKILLS INTELLIGENCE ECOSYSTEM



The Data Model Costruction



⇒ WORKFLOW



⚙️ STRATEGIC ADVANTAGES



Flexible Star Schema

Verified information is structured within a **central data warehouse** for fast, scalable multidimensional queries.



High Performance

An **architectural foundation** that guarantees rigorous data compliance and academic research standards.



Institutional Adaptability

Built to export findings to tools **from dashboards to student apps**.

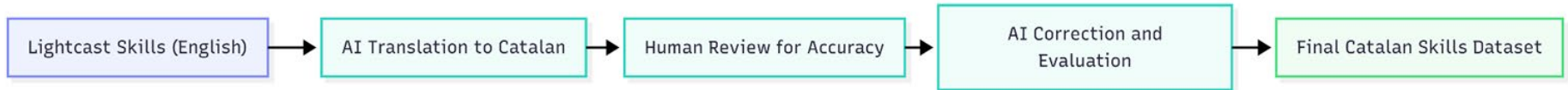
AI-based Occupation Standardization with Semantic Embeddings and Dense Retrieval for Multilingual Normalization and LLM-based Entity Extraction.

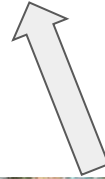
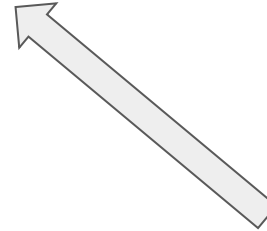
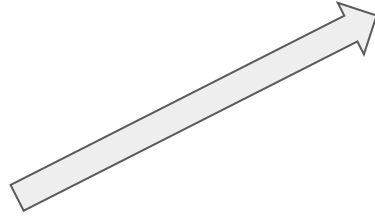
- LLM-based entity extraction using prompt engineering and hyperparameter tuning for occupational information in complex texts.
- Occupation normalization using dense embedding models trained on ESCO and cosine similarity for semantic standardization.
- Semantic enrichment of terms in complex educational and technical documents for subsequent vectorization and cosine similarity computation.
- Human review was incorporated to validate and refine terminology selection, ensuring a human-in-the-loop approach and overall system quality.



AI-Assisted Translation and Review of Technical Texts Using Large Language Models.

- Lightcast skills were translated from English to Catalan using AI-based translation models.
- Human review was incorporated to ensure linguistic accuracy and domain consistency.
- AI was also used for correction and evaluation of translation quality.





Vacancies data (Lightcast)
 Close to **10 million** registries,
 2018-2025

Stakeholders co-creation
 meetings

Official statistics



Validation

Teacher Tools

A system to maintain an updated and relevant education offer

LABOUR MARKET ALIGNMENT: A CONTESTED CONCEPT

PRO

- Schooling is an investment in skills that increases productivity (Becker 1975; Schultz, 1960))
- Education that is more aligned with the labor market leads to lower unemployment and higher initial returns. (but, not well known long run effects)

AGAINST

- Education is more than training. Education should develop capabilities (Sen & Nussbaum,
- Risk of stripping mathematics or humanities from curricula.
- Risks of seeing education as a corporate project and of metrification

DIGITAL & GREEN TRANSFORMATION AND AUTOMATION

- Hiring in companies is increasingly skill-based.
- Rapid skill change within each occupation
- Automation substitutes humans in specific tasks → increasing need to invest in transversal, durable, human skills. Learn to Learn becomes a key skill
- Higher returns to those that combine STEM and human skills (Deming, 2017)

THE MICROCREDENTIAL MOVEMENT



- Microcredentials as a way to address **dynamic skill gaps** (EU, 2022)



- A credential that certifies learning outcomes of short learning experiences.



- Creation of new offerings: Need to identify these shifting skills



- Initial education up to college degree need to focus on **foundational, durable** skills, with some specific skills to bridge today's skill gaps.



- Skills **updated** through lifelong learning.
- Need to identify which skills are needed today and in the future (for microcredentials) and curricular badges)

CURS **Inscripció oberta**

Bases de dades analítiques

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Bases de dades noSQL

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Customer Analytics

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Data Governance

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Data Lakes

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Estratègia i Cultura Analítica

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Fonaments d'Intel·ligència de Negoci

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

Fonaments de Big Data

[Veure tota la informació >](#)

+ Mostrar dades clau

CURS **Inscripció oberta**

CURS **Inscripció oberta**

UOC MICROCREDENTIALS

99+ short courses (1 -6 ECTS)

Centered around soft, digital and green skills.

With a certificate
Quality-assured



What is our goal?

Provide information to help the UOC adapt its training offer to the current and emerging needs of the labour market (...)

Mercat de Treball: tendències globals. Ocupacions i competències més demandades a Espanya (2025)

Informe ampliatiu (primer illarabari)

Informe ampliatiu i complementari de l'Informe de Tendències del Mercat de Treball de Espanya (2025) elaborat per l'Observatori de l'Economia i el Treball de l'Institut Nacional d'Estadística (INEC) i el Centre d'Estadística de l'Observatori de l'Economia i el Treball de l'Institut Nacional d'Estadística (INEC).

UOC

Universitat Oberta de Catalunya



1. Ocupacions

Selecciona per estat UOC: Selecciona per Ramat UOC: Selecciona per grau d'Estudis: Selecciona per ocupació: Filtra per CMA:

Vacants per ocupació

Ocupació ESO2 mod €	2018	2019	2020	2021	2022
Administració general	217%	202%	-12%	1%	5%
Direcció de treball i desenvolupament	245%	18%	24%	2%	2%
Direcció de serveis operatius	125%	17%	13%	2%	2%
Professors de primària i secundària	145%	14%	1%	1%	2%
Direcció i supervisió de centres i equips de treball	105%	1%	1%	1%	1%
Substitució: assistència sanitària de nivell mitjà	87%	1%	1%	1%	1%
Assessoria de gestió empresarial	87%	1%	1%	1%	1%
Supervisió de qualitat i control de tecnologia de la informació i les comunicacions	81%	1%	1%	1%	1%
Administració i gestió de personal i salut	62%	1%	1%	1%	1%
Recepció	44%	1%	1%	1%	1%
Assessoria de serveis tècnics i d'enginyeria	42%	1%	1%	1%	1%
Direcció de projectes i realització	33%	1%	1%	1%	1%
Coordinació general i gestió personal	30%	1%	1%	1%	1%
Professors de nivell mitjà i nivell superior	30%	1%	1%	1%	1%
Coordinació del treball	23%	1%	1%	1%	1%
Professors de nivell superior	17%	1%	1%	1%	1%
Altres professions de nivell mitjà i nivell superior i nivell superior	14%	1%	1%	1%	1%
Supervisió i gestió d'operacions	14%	1%	1%	1%	1%
Direcció de la qualitat i realització de projectes	10%	1%	1%	1%	1%

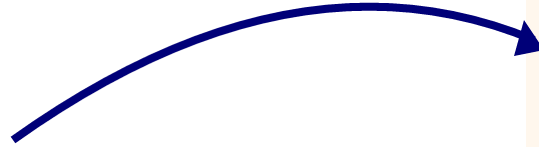
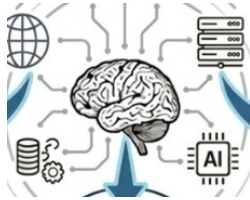
Evolució mensual de les vacants (2018-2024)

Les vacants amb més vacants (2024)

- Administració general
- Direcció de treball i desenvolupament
- Direcció de serveis operatius
- Professors de primària i secundària
- Direcció i supervisió de centres i equips de treball
- Substitució: assistència sanitària de nivell mitjà
- Assessoria de gestió empresarial
- Supervisió de qualitat i control de tecnologia de la informació i les comunicacions
- Administració i gestió de personal i salut
- Recepció
- Assessoria de serveis tècnics i d'enginyeria
- Direcció de projectes i realització
- Coordinació general i gestió personal
- Professors de nivell mitjà i nivell superior
- Coordinació del treball
- Professors de nivell superior
- Altres professions de nivell mitjà i nivell superior i nivell superior
- Supervisió i gestió d'operacions
- Direcció de la qualitat i realització de projectes

Ocupacions emergents (potencialment)

Job market reports within the framework of university processes



PO01- Defining new training offerings/degrees

PO02- Designing new training offerings/degrees

PO07- Follow-up

Improve available information for teachers and program managers to make better decisions on a recurring basis



Report on the current state of the labor market

Tool for the interactive visualization of labor market indicators

Unitat de Prospecció i Anàlisi Laboral (UPAL), UOC

Authors: Natalí Basilico, Gonzalo Cubillos, Adrià López, Marina Muñoz Martínez, and Carmen Pagès, with the support of the UOC Data Office

June 2025



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de Catalunya

Si us plau, citeu aquest contingut com a:

Basilico, N., Cubillos, G., López, A., Muñoz, M., & Pagès, C. (2025). Informe sobre l'estat actual del mercat laboral. Unitat de Prospecció i Anàlisi Laboral (UPAL). Universitat Oberta de Catalunya (UOC).

Student Tool

A system to stay up to date and find the way in the labour market

Recognize and boost your talent with GPS Professional

Discover how your professional profile fits in the job market and how to develop your career.

This is an initial version. We'll gradually add new features.

[Access Professional GPS >](#)

01 Enter details of your current occupation and professional profile

02 Select your competencies

03 Take a look at your results, and download a personalized report

GPS Professional - Improvements

Current improvements

UX improvement

- Improved view
- More filters and improvements in searches and presentation of data (vacancies evolution)
- Improvement in the visualization of the downloadable pdf

Improvement in data quality

- More updated and granular data (approx. 13000 skills (ESCO) at +30000 skills that come from job offers published online)

"Reskilling" route

- Reuse your skills
- Look for occupations "proximate" to the set of selected skills

Data persistence

- User profile
- Possibility of accessing the last searches (upskilling and reskilling)

Future improvements

Course recommender (supported by AI)

- Personalized learning itineraries based on training gaps
- Creation of a database that relates RAs with labour market skills and program (RESUAPRE)

Automation of skill inclusion

- Skills reader from CVs
- Retrieve skills from Europass/Linkedin

Inclusion of a third path

- To the upskilling and reskilling we will add the possibility of searching for career paths from academic fields

More labour market information

- Remote work

Open Tool

The Barometer of Skills and Occupations

WHAT IS THE OCCUPATIONS BAROMETER?

In this section, you will submerge yourself in a detailed analysis of the evolution of demand in the Catalan labour market through vacancies posted online. Our goal is to offer you a holistic view of occupational trends, providing key figures and essential data based on the content of online vacancies.

Join us and you will have the necessary information to understand the dynamics of the labour market in Catalonia!



The Labour Market in Catalonia

Explore the latest trends in vacancies posted online in Catalonia!



The Most In-Demand Occupations by Economic Sector

Do you know which profiles are in highest demand across the different sectors of the Catalan productive fabric?

THE BAROMETER STUDIES



Soft skills in a digitalized world

March 2024

[Download report](#)



Digital transformation from the perspective of the labor market

July 2024

[Download report](#)



Green jobs and skills for the ecological transition

November 2024

[Download report](#)



The new managerial profile: Current trends and changes in skills

March 2026

NEW REPORT



X-ray of the demand for talent in Catalan MSMEs

March 2025

[Download report](#)



Evolution of occupations and skills in the Catalan labor market (2018-2024)

July 2025

[Download report](#)



New ways of organizing work: teleworking in Catalonia

November 2025

[Download report](#)

A research agenda on skills intelligence and microcredentials

A research agenda on skills intelligence and microcredentials.

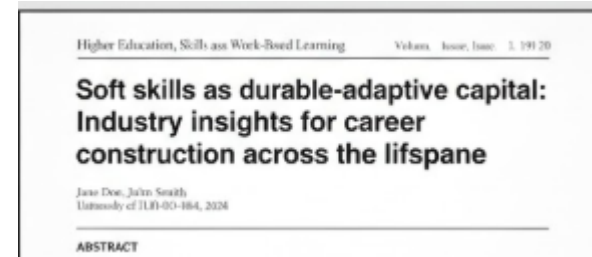
Understanding Micro-credential Adoption: Evidence from a National Survey on Lifelong and Continuous Education Needs

Journal of Lifelong Education

Vol. 10, Issue 2, 2023, pp. 123-145

Tailoring Micro-credentials for Diverse Learners: A Qualitative Study of Motivations and Course-Design Preferences in European Higher Education

Jane Doe, John Smith, et al.
University of Euro-Academic Institution, 2023



ARTICLE

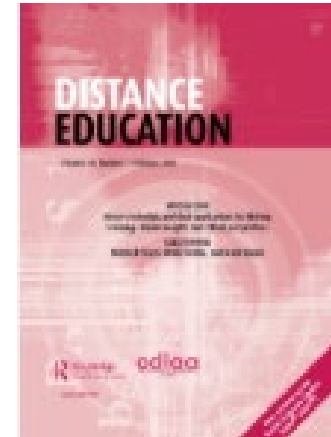
OPEN ACCESS

Check for updates

Micro-credentials and soft skills in online education: the employers' perspective

Carles Bruguera^a , Carmen Pagés^a , Mitchell Peters^a and Angels Fitó^b

^aLabour Market Research and Analysis Unit, Universitat Oberta de Catalunya, Barcelona, Spain; ^bUniversitat Oberta de Catalunya, Barcelona, Spain



Lessons learned

Lessons from Skills Intelligence Practice

1. Intelligence Must Be Designed for Its Audience

At UOC, the same intelligence serves multiple audiences: students (Professional GPS), faculty (labor market reports), employers, and policymakers (barometer). Each group has distinct needs regarding **granularity, update frequency, and interface requirements.**

2. The Bridge Function Is the Core Value

The unit acts as a bridge between the labour market and the university, external and internal intelligence, and data and decision-making.

We translate between two systems that speak different languages. Maintaining trust on both sides is the most valuable part of the job.

3. The Data Universe Problem is hard to overcome

Coverage Blind Spots - A big challenge is knowing what our data actually covers — and what it does not.

Granularity & Public Availability - Spain lacks reliable occupational comparison data at 4+ digit granularity; contract data is not made publicly available.

Sectoral Under-representation - Source comparisons reveal data under-represents SMEs, construction, and low-skill occupations—critical for open tools.

Longitudinal Consistency- Maintaining consistency over time is challenging when sources change. Long-term series are preferable to cross-sections despite the risks.

4. The Ontology Choice Is Consequential

- ESCO provides institutional legitimacy and cross-country comparability but moves slowly
- Lightcast captures emerging skill language faster but is a commercial product.
- We work with ESCO for occupations + Lightcast for skills, but a robust crosswalk is essential — and non-trivial + *Dependency risk*

5. Needs Move Faster Than Data

- Skill needs are always ahead of what data can reliably measure, even with sound ontologies
- High granularity is required; classification errors are costly; data is always catching up
- *Combining different data sources is essential*

Lessons from Skills Intelligence Practice



Skills Intelligence can help us understand skill needs and gaps and inform the design of microcredentials — but the practice is harder than it looks. Here is what we have learned.

7. Bridging Labour Market and Education Data Is Difficult

- The conceptual gap between needs and learning outcomes cannot be collapsed by taxonomy or AI alone
- Human judgment in the loop remains essential — for now, and likely structurally

8. Credibility Is Fragile

- All is undone if stakeholders stop trusting the outputs — trust can be lost quickly from a single error but big data is inherently noisy and prone to errors.

9. Our Data Mix Needs to Evolve

The Multi-Method Approach

Vacancy data alone is insufficient; we need to move toward combining it (structurally) with:

- Qualitative research
- Graduate tracking
- Population surveys

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