Labour market and skills information systems for VET policies
Blending traditional approaches with Big data or artificial intelligence analytics

5th Cedefop Brussels-based seminar
26 June 2018, 9.30-13.00, Brussels, Belgium

General information

Organiser	Cedefop
In cooperation with	The Bulgarian Presidency of the Council of the EU
Venue	Permanent Representation of Bulgaria to the EU 49 Square Marie-Louise, 1000 Brussels
Participants' profile	Brussels-based stakeholders from the Permanent Representations of Member States to the EU, European Commission, the European Parliament, European business and sector associations, trade union and employee organisations.
Working language	English

Cedefop, together with the Bulgarian Presidency of the Council of the EU, have the pleasure to invite you to the 5th Cedefop Brussels-based seminar. These seminars, organised in cooperation with the rotating EU-Presidencies, build on Cedefop research and analyses and address issues relevant to European debates on vocational education and training (VET) and employment.

Focus of the June 2018 seminar

To which extent can integrated labour market and skills information (LMSI) systems, namely systems and processes collecting, analysing and disseminating a wide range of data on skill supply, anticipated skill needs and skill mismatches to multiple actors (e.g. policymakers, social partners) and other beneficiaries (e.g. VET providers, guidance counsellors, citizens), inform VET and employment policies in EU Member States? What are the opportunities and challenges or new data analytical instruments, reliant on Big Data and/or artificial intelligence (AI) methods, for integrated LMSI systems?

Aim of event

Building on insights from recently developed Big Data and/or algorithmically-empowered data analytical tools, the event will seek to spur debate on important questions, including:

▸ What are the features of existing or conventional integrated LMSI systems that effectively influence the design of skills policies in the EU?
▸ How to ensure that integrated LMSI systems effectively reach out to multiple stakeholders and potential beneficiaries?
▸ How can effectiveness and quality of public policymaking be increased through new Big or AI-based data analytical instruments?
▸ What good examples of practice exist in EU countries and worldwide?

The seminar

The objective of the 5th Brussels-based seminar will be to highlight the importance of a 'blended' approach, taking into consideration the latest developments in AI-based tools for collecting and analysing LMI. Cedefop and external experts will seek to uncover promising approaches in effectively integrating new data analytics methods within the existing skills anticipation and governance processes of EU countries.

To that end, Cedefop's holistic approach to skills governance, in which integrated LMSI systems constitute a key pillar, will be presented. In addition, examples of good practices of use of labour market and skills intelligence in public policy-making will be showcased, drawing from a new Cedefop database containing more than 100 policy measures from EU countries. The seminar will also provide an overview of new developments in AI-based data analytics, which may contribute to faster and better skill needs identification and matching. A key objective of the event is to debate the promise and challenges posed by what is anticipated to be wide-ranging application of new predictive instruments in public policy in the coming years.

The challenge of integrated LMSI systems for policy

Strengthening integrated LMSI information systems has been identified as one of the three pillars of the New Skills Agenda for Europe ([1]). It is generally acknowledged that better and timelier information on current and future skill needs, learning needs and career paths, can help make VET and active labour market policies more responsive. However, in a recent global survey over 60% of national constituents reported that the way skills are measured in traditional approaches are either too specific, aggregated or fail to inform relevant policy domains ([2]). Use of such information by a wider group of beneficiaries also appears to be a challenge: only 27% of EU adult workers had access to information on learning needs with stark country differences ranging from as high as 40% in Denmark, Luxembourg and Finland to less than 10% in Greece, Bulgaria and Romania ([3]).

Several EU Member States face challenges in ensuring that a broad array of potential beneficiaries have access to (and can provide feedback on) the results of integrated LMSI systems, and that such intelligence meets the needs of diverse audiences. In many countries the effective transmission of labour market intelligence is a weak link in their *skills governance systems*, undermining the returns to investment in state-of-art skills anticipation and forecasting projects ([4]). Common constraints of integrated LMSI systems include lacking appropriate data sources for decision-making and policy evaluation, information asymmetries, fragmentation between different layers of government and capacity constraints (both human and financial). However, weak transmission efforts can also reflect the limited relevance of conventional skills forecasting methods and instruments for policy design and implementation ([5]).

([1]) http://ec.europa.eu/social/main.jsp?catId=1223

([2]) Kriechel B. and Vetter, T (2018), *Skill needs anticipation: systems and approaches,* (eds) ILO-OECD-Cedefop-ETF, International Labour Office: Geneva.

([3]) Cedefop (2018), *Insights into skill shortages and skill mismatch: Learning from Cedefop's European skills and jobs survey*, Luxembourg: Publications Office. Cedefop reference series; No 106. http://data.europa.eu/doi/10.2801/645011

([4]) Pouliakas, K.; Ranieri, A. (2018). 'Governance of labour market and skills intelligence as driver of VET reform'. In: Palmer, R. (ed.) *International handbook on vocational education and training for the changing world of work*. Section 3: *Planning and reforming skills system.* Springer Publishers; European Commission (2015) *Skills Governance in the EU Member States: Synthesis report for the EEPO*, Publications Office of the European Union, Luxembourg.

([5]) OECD (2016) *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, OECD Publishing, Paris, DOI: http://dx.doi.org/10.1787/9789264252073-en

The future of data analytics on skills and (anticipated) skill needs

The development of new data analytical instruments is expanding at an exponential pace across public and private actors. The advent of machine learning and algorithmically-powered tools for collecting and analysing trends in skills needs and training opportunities has recently raised high hopes. They are expected to help improve skills anticipation and matching capabilities and diagnostics in countries and enterprises. Prominent examples include the European Commission's monitor for ICT online vacancies and Cedefop's Big Data analysis from online job vacancies, deep learning skills matching algorithms employed by VDAB (the Public Employment Service of Flanders, Belgium), identification of reskilling pathways by the World Economic Forum and Burning Glass, LinkedIn's Economic Graph as well as IBM's Watson-powered employee learning and career adviser portal.

Such initiatives are promising. They enable better skills matching and provision of more timely, targeted and customised information for users; they can also support efficiency and responsiveness in public policy-making.

Relying on such AI-based instruments and tools entails however several significant challenges for policymakers and other users. AI-based skills matching algorithms are more likely to be influenced by systemic and inherent biases and misconceptions in their predictive capabilities. Using the outcomes of such instruments may lead to misguided policy decisions if they are not placed in the right (institutional) context, or if specific skills governance processes, such as social dialogue are not in place. Quality assurance in VET provision as well as public employment service delivery may also be undermined when traditional methods used to steer guidance services are replaced by methods relying solely on Big Data and AI approaches. It is therefore important to use these instruments as complementary to, rather than replacements of, more 'traditional' approaches.

In addition to learning about influential recent Big data/AI-based analytical innovations, seminar participants will benefit from engaging in a debate regarding the advantages and disadvantages of such methods in comparison to conventional approaches. The seminar outcomes should enrich their capacity to influence development and implementation of labour market and skills information systems.

AGENDA

Please find below the agenda of the event with details in that regard.

Tuesday, 26 June 2018	
	Moderator: Jens Bjornavold (Cedefop)

09:30-10:00   Arrival and registration of participants

10:00-10:20   Welcome and setting the scene

Bulgarian Presidency of the Council of the European Union (hosts)
Yasen Gyurov (First Secretary for Education and Training)

Making labour market/skills intelligence relevant for VET policy
Alena Zukersteinova (Acting Head of Department, Cedefop)
Konstantinos Pouliakas (Expert, Cedefop)

10:20-11:00   The future of data analytics on skills and skill needs

Getting data on skills in real time
Jasper van Loo (Expert, Cedefop)

Transformation, transitions and employee empowerment
David Barnes (IBM, Global Workforce Policy)

11:00-11:15   Q & A

11:15-11:30   Tea/coffee break

11:30-12:30   Big Data for skills matching

Deep learning and AI for better skills matching
Erik Klewais (VDAB, PES, Flanders)

Vacancy mining for validating and supplementing labour market taxonomies: challenges and lessons learnt
Claudia Plaimauer (3s Unternehmensberatung)

Blending the old with the new: Lessons from the Getting skills right initiative
Fabio Manca (OECD, Skills and Employability Division - ELS)

12:30-13:00   Q & A

13:00-13:30   Light lunch

Cedefop research relevant to the seminar

Assisting EU countries in skills matching

http://www.cedefop.europa.eu/en/events-and-projects/projects/assisting-eu-countries-skills-matching

*Addressing skill mismatch in countries cannot only rely on more and better tools of skill needs identification in labour markets; it requires an integrative approach to **skills governance** among key stakeholders, which can foster and sustain a virtuous feedback loop between labour market and education and training actors. Skills governance refers to the process of putting in place appropriate institutional structures (intermediary, formal or informal, skills bodies), operational processes (regulation, management, financial and non-financial incentives) and dissemination channels (online or offline platforms) that may facilitate stakeholder interaction and policy reaction based on reliable labour market information signals. Since 2016 Cedefop has provided technical advice to countries asking for its support to improve their 'governance of skills anticipation and matching', working together with countries to identify country-specific challenges, bottlenecks and policy solutions for achieving effective skills governance. The country support that Cedefop provides aims at improving methodological instruments that collect labour market and skills intelligence and seeks to facilitate effective dissemination and use of results in different policy spheres (e.g. education and training, employment, active labour market policies etc.), in collaboration with key national stakeholders.*

To effectively carry out the country reviews, Cedefop has developed a comprehensive skills governance analytical framework that identifies key elements and ingredients of well-functioning systems of skill needs anticipation in EU countries.

Database on skills matching policies and practices

http://www.cedefop.europa.eu/en/publications-and-resources/publications/5546

Cedefop's 2013 project 'Collection and review of skill mismatch policies and practices in the EU' identified more than 100 examples of recent and ongoing policies and practices employed by EU Member States, aimed at either tackling unemployment due to skill deficits of job applicants or mitigating skill shortages. In 2018 Cedefop updated the collection by incorporating recent and ongoing initiatives that use labour market and skills intelligence (LMSI), namely information based on labour market/skills assessments and skill anticipation exercises, for informing policy. Examples of such initiatives include the use of LMSI for informing/updating the design and formulation of learning outcomes associated with qualification levels specified in national qualification frameworks (NQFs), updating and/or (re)designing list of training programs associated with active labour market policies, (re)designing or updating training/skill standards and skill accreditation programs, influencing decisions on course funding/provision as part of initial or continuing education and training provision, (re)designing, developing or funding apprenticeship programmes, updating knowledge and training of career guidance and counsellors or informing career-making decisions of students based on information of labour market trends/vacancies/skills matching etc.

An online platform exhibiting all such examples of policy programs and practices adopted in EU Member States will be made publicly available in October 2018 on Cedefop's web portal.

Digitalisation and future of work

http://www.cedefop.europa.eu/en/events-and-projects/projects/digitalisation-and-future-work

Cedefop's 'Digitalisation and the future of work' project analyses the impact and drivers of automation, robotics, artificial intelligence and other digital technologies on employment and changing skill needs of jobs. It also examines the implications of new forms of digital labour, such as platform or crowd work, for individual's skills development and skill mismatch. The insights of the project aim to inform policy regarding the future of vocational education and training. The project is structured around five main pillars:

(i) the risk of automation across EU economies, sectors and occupations to understand who is at most risk of job polarisation and substitution by machines; (ii) learning practices and challenges of continuous learning, skills development and skills matching of individuals employed in new ICT-based forms of work, specifically in the platform or 'gig' economy (CrowdLearn project); (iii) new data on changing skill needs and mismatch due to technological advances and digitalisation for both enterprises and employees , via the European skills and jobs survey and the 4th European Company Survey; (iv) machine learning techniques to facilitate better understanding of the online job vacancy market and the changing skill needs implied by new technologies; (v) strengthening capacity among EU countries in implementing technological skill foresight methods.

Big Data analysis from online job vacancies

http://www.cedefop.europa.eu/en/events-and-projects/projects/big-data-analysis-online-vacancies

Information on skills demanded from job-seekers by employers is very useful to inform career and continuing VET decisions of individuals as well employment services and guidance counsellors. A feasibility study carried out by Cedefop has confirmed that a pan-EU analytical tool for collecting data on skills demand by employers using online job postings can be set up. Cedefop will therefore further develop the current prototype in order to collect data for the whole EU. The data collected within the feasibility study allow for identifying skills and job requirements typically requested across occupations as well as new and emerging jobs and skills.

The project by Cedefop to develop an EU-wide system started in 2017. First results will be released end of 2018 and a fully-fledged and validated dataset for all EU Member States will be available in 2020. The project will benefit from collaboration with other EU institutions, in particular DG Employment and Social Affairs, DG Connect, Eurostat's big data task force and network of European statistical systems (ESS – net). Some EC initiatives (such as ESCO, EURES) will strengthen the usability of the pan-EU tool for vacancy scrapping and analysis, while other initiatives – the new Europass and the Blueprint for sectoral collaboration - will benefit from the data collected.