



NOT JUST NEW JOBS: DIGITAL INNOVATION SUPPORTS CAREERS

**New technologies offer people opportunities to learn,
plan their careers and strive for more balanced lives**

It is widely accepted that digital innovation is changing work environments and occupational profiles, impacting on people's learning and work. But how does it affect the way people can manage their careers, train and change jobs? Thanks to innovative tools, greater data availability and artificial intelligence, new approaches to career development support and self-directed learning are transforming lifelong learning. Cedefop has been looking into European countries' recent practices, to see how they help their citizens make relevant career and learning choices ⁽¹⁾. To harness the potential of innovative approaches, policy-makers and practitioners need to pay attention to required conditions of success and emerging challenges.

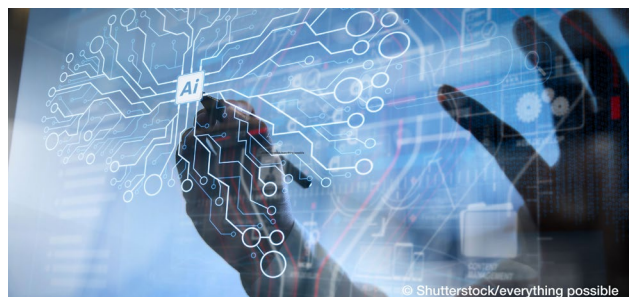
Most wanted: workers who can adapt to change

Cedefop's current analysis of online job vacancies across the EU highlights workers' adaptability to change as the skill most sought after by European employers ⁽²⁾. This is hardly surprising, considering the current fluidity of occupations, work organisation and technologies. Fostering adaptability is an enormous challenge, both for individuals and organisations, and requires investment in new sets of skills and knowledge usually not addressed by technical training. Career management skills are part of these skills. They include awareness about one's skill needs and potentials, and capacity to lead one's own learning, make decisions, and plan and act upon career opportunities.

First port of call: online services

Managing a career in the 21st century is becoming easier. A multitude of online services is available to those who want to explore their potential autonomously

by searching for new learning and working options. Self-service offers of information on occupations and learning opportunities, combined with personal skills and attitudes assessments, have flourished across the EU. Many include the possibility to create personal portfolios detailing skills, qualifications, experiences and aspirations. Increasingly, such websites include matching engines, linking personal traits and skills to advertised vacancies and allowing people to draft their CVs and apply for jobs. Some of these platforms are well known and widely used. However, the quality of these digital services varies, depending on how and by whom content is created, how they are supported, and how they engage users.



Flexible services delivered via multiple channels

Self-directed online services tend to be of less use to people with relatively low levels of skills and knowledge. Their digital skills may be insufficient to use the web platforms, career information may be difficult to find and interpret, and users may simply have questions which are not answered by available content. Many people need qualified guidance practitioner assistance to make the most of these digital tools. A common strategy is to rationalise support through a combination of delivery channels (such as telephone, chat and email). The right combination of channels depends on users' needs, which are usually progressively assessed to adjust the support they receive. Access to face-to-face interaction tends to be reserved for users with greatest needs.

⁽¹⁾ On the basis of information collected through its [network for lifelong guidance and career development, CareersNet](#).

⁽²⁾ See also [Cedefop's website](#), a [Cedefop briefing note](#), a [video](#) and the [Skills Online Vacancy Analysis tool for Europe](#).

In this context, guidance professionals' own jobs are changing; many are adopting a different mind-set. Practitioners need to be willing to revise their strategies and to help develop technology-rich methods, while managers need to back this up with staff development plans. Drawing on good practices across Europe, Cedefop has developed a [set of training modules](#) specifically aimed at facilitating changes in career services' attitudes to ICT.

BOX 1. EGUIDANCE DENMARK

[eGuidance Denmark](#) was launched by the Danish Ministry of Children and Education to bring guidance services to as many people as possible thanks to new technologies such as online chats, text messaging and Facebook, along with more traditional communication via email or phone. This service is part of the national [guidance portal](#) which contains comprehensive labour market information covering the whole country – the basis for efficient guidance. eGuidance employees work in guidance and job centres across the country and have been trained to deal with the specific requirements of new communication media. The system is addressed to learners in secondary and tertiary education and to adults who seek assistance with their career management and skills development. Its new features, such as online chats, have become particularly popular with young people.

Services: locally engaged and context-responsive

Successful digital services are frequently born out of specific local needs, while central coordination tends to remain an important factor for their sustainability. They meet their full potential when sourcing their information directly from local enterprises and stakeholder networks, leading people to guidance, training, work experience and jobs accordingly. As a result, teachers, trainers, mentors, entrepreneurs and other members of a given community play an increasing role in the development of their fellow citizens' career management skills. In Finland, secondary students submit their portfolios to various professionals to find periods of work experience in enterprises, via a school service supported by an online platform, and supported by guidance practitioners and teachers. Inversely, employers advertise their work experience offers through the same educational platform and co-operate with both guidance and education staff to ensure programme relevance and pedagogical adequacy. In Belgium, a programme promoting early student contact with emerging professions uses digital simulations of work contexts. The initiative is implemented by guidance and teaching staff and supported by chambers of industry and commerce.

Surprising? Gaming and edutainment in guidance

Computer games have been used in the past, though with limited scope, to allow young people to inform themselves about occupations and learning options. Current initiatives are promoting more extensive use of the variety of environments and the higher degree of user engagement modern games can offer. For example, a gamer can play an occupational simulation or a role playing game with emphasis on communication or trading skills, while management games aim at career related skills and puzzlers test or focus on cognitive skills. Games can register gamer behaviour, adapt gaming conditions and provide information to be used by practitioners to complement assessments, provide feedback and help establish career development activities. While this is quite a recent area of development, it holds great promise; appropriate support from career development models (see box below) can help bring young people's dreams and ideas to fruition.

BOX 2. YOUTH@WORK SCOTLAND

Planning an education, training and working career is a difficult yet important endeavour for most young people. The game Youth@Work was designed by a team of international specialists to raise teenagers' career awareness and make them start thinking about their education options and professional outlook in both a positive and realistic way.

The game designers and developers identified the required career competences and inserted them as learning outcomes in the game. To characterise the desired learning outcomes, and to specify the activities in the different zones of the game, they drew on feedback from young players as well as on two theoretical frameworks.

[The Skills Development Scotland model of career management skills](#): this sets out a comprehensive approach to supporting individuals to acquire and use key skills that best enable them to plan and pursue life, learning and working opportunities, i.e. career management skills. It helps them identify their existing skills and necessary learning goals with a view to improving their employability and adaptability to change.

[American psychologist John Holland's model of vocational interests](#): this is based on the idea that careers are determined by interaction between personality and the environment: we want jobs with people like us, so people search for environments that will let them use their skills and abilities and express their attitudes and values, while taking on enjoyable problems and roles.

The game has been developed as an open source project in Unity and is playable from Safari and Firefox. It is available [here](#); it needs a Unity web player plugin.

Digital career management tools and resources

Managers and HR professionals can use digital portfolio tools to plan staff (re)deployment and training by registering the results of assessments and outcomes from training and skills development activities (such as mentoring and coaching). If well integrated in long-term human resources development, these tools can help firms manage the talents of their staff, plan succession and support innovation. Individual portfolio management, when combined with flexible learning strategies, can support reorganisation of production and reinforce workers' skills sets and autonomy.

Online training offers are increasingly branded with quality seals, and participants receive a certificate or proof of qualification. The growing importance of such training schemes (mainly addressed to adults) is reflected in the fact that several European countries have started to connect qualifications obtained outside the formal education and training system to official qualification standards, such as their national qualification frameworks (France with its [accreditation of prior experiential learning \(VAE\)](#), the Netherlands, Poland with its market qualifications).

BOX 3. MY CAREER – CAREER PORTFOLIO IN BELGIUM (FLANDERS)

In Belgium, the Flemish public employment service (VDAB) offers the online system *Mijn loopbaan* (My career), which allows users to create a fully personalised online portfolio. This portfolio allows them to keep track of their competences and qualifications, create their CV and upload it to an online platform used by employers. The system is connected to the job vacancy database and uses sophisticated matching techniques (e.g. based on competences). *Mijn loopbaan* can also be used to search for multiple types of education and training opportunity. To support early career learning and increase uptake among young people, VDAB offers half-day or longer hands-on training sessions to teachers on how to make autonomous use of My career and how to familiarise their pupils and students with this tool.

Single points of access and use of big data

In many countries, single national entry points to labour market information have been trending thanks to big data mining and other digital advancements. These services pull together labour market data scattered over different websites, and provide user-friendly interfaces, data visualisations or open access to data blocks, along with the possibility of tailoring the user interface. An example is the popular UK-based online portal [LMI for all](#) which connects and standardises labour market information sources of high quality to make it easier for workers, job seek-

ers and employers to take career decisions. This data is freely available for use in relevant apps and websites via an application programming interface. These and similar services now benefit from data reflecting online vacancy notices, which can be used both to depict labour market behaviour and create engines to match users to job offers. While big data mining can improve career intelligence it must be based on quality data from a wide range of sources. Current data is sourced from internet sites and public employment services; it can potentially be biased and based on low quality records. Its quality will likely rise as national authorities make efforts to label and harmonise vacancy data.

Promising yet challenging: AI and machine learning in career development

Artificial intelligence (AI) can bring improvement to self-directed services. Based on users' behaviour and data stored in personal portfolios, it can suggest tailored information, development activities and job matches. As machine learning allows dynamic algorithm refinement through pattern recognition, AI is increasingly used in gaming and edutainment and in social media.

However, machine learning in career development is still in its infancy, considering the unequal quality of the data it needs to learn from. Data labelling may be weak in many countries (as with job vacancy labels) and the current tendency to use social media data tends to bias identified patterns, depending on the type of use people make of them (e.g. Twitter versus Facebook posts). There are also legitimate doubts regarding the public generalisation of algorithms which have been developed in contained environments. For example, tools which help find jobs and provide career advice need to be 'trained', as much as possible, with representative samples of real users. Current challenges suggest that there is still a need to improve base data. This will require national investment, better regulation and careful piloting of machine learning in career development support.

Digital technologies support lifelong careers...

Personal, dynamic career information, when supported by a broad consensus on information standards, channels and procedures, can be used to provide seamless support to learners across organisations such as employment offices, guidance centres, schools, social security centres and enterprises. Robust national qualification and validation systems, allowing for integration of adult education certificates obtained outside the formal education system, play

a key role.

Digital portfolios are becoming increasingly instrumental in policy coordination and provision of adult learning. Used well, portfolios allow for high quality referrals between services which assess skill needs and give career advice to training providers and validation services.

... and lifelong learning

Blended learning, combining electronic resources with face-to-face interaction between learner and teacher, allows for adaptation to the context of users and their available time. In this model of provision, the practitioner can position himself/herself as an informed partner who helps the user design his/her own learning experience, by selecting online resources and scheduling activities. The approach can use synchronous or asynchronous learning, diversified media and mobile apps. Blended solutions can address the specificities of workplace learning, classroom situations and home utilisation.

BOX 4. ONLINE MENTOR SUPPORTING BLENDED LEARNING

Specialists from five countries (Bulgaria, Czechia, Lithuania, Romania and Slovenia) have been developing an [online mentoring and peer coaching resource for youth trainers](#) – nurses, social and youth workers, and teachers – who want to become mentors of young adults over 18 at the beginning of their careers.

The resource contains a training course on career guidance and blended-learning mentorship, a collection of best practices concerning gender balance and non-discrimination in career guidance, as well as guidelines for professional peer-coaching and face-to-face contact with young people.

The aim of the (continuing) project is to create a network of professional trainers specialised in mentorship based on learning activities which can be created flexibly, at any point, with the support of digital tools. This blended approach is offered to young people with the aim of increasing their employability and entrepreneurship skills and helping them manage the transition from education to work.

Career support as an individual right

Consolidation of career support as an individual right is intertwined with development of digital citizenship. The European Pillar of Social Rights promotes access to career development support as an individual right linked to equal opportunities to learn and to work; some countries have made access to guidance a legal right. Estonia is taking a step beyond, integrating career support in the implementation of digital citizenship. Current developments in lifelong learning suggest that this is a meaningful strategy. Digital portfolios can be used to register and help im-

plement individual rights, such as [guidance vouchers](#) (BE-Flanders) and [personal learning accounts](#) (France). Fostering access to publicly available learning resources, matching platforms and other services can be part of a citizen's digital 'ecosystem' which adapts to his/her evolving needs 'from the cradle to the grave'.

What the future holds

Current developments in data availability and increased in computational power suggest that lifelong support to careers is more available than ever. Digital innovation, when appropriately embedded in guidance, learning and work contexts, drives progressive change from passive to dynamic support tailored to changing individual needs. To some extent, employment, education and training policies are still caught up in 'silos', applying one-size-fits-all solutions, potentially due to the impossibility of managing and transmitting complex individual information. This approach is gradually being superseded: people can now learn and get support on the basis of what they know and need, with information transmission becoming ever easier.

To improve the use and reach of digital tools, national authorities and other promoters need to reflect on appropriate ways to adapt current innovation to their needs and contexts. To support potential promoters of digital innovation, Cedefop has developed a decision-making tool that allows policy-makers to evaluate transferability and adaptability of digital services for career support (including matching, profiling and portfolios). An interactive version will be available by the end of 2019.

All these innovations hold promise in helping provide users with high quality, tailored online information and advice, but holistic, personalised support will probably always need human intervention. This certainly applies to complex and deeply social activities like counselling.



CEDEFOP

European Centre for the Development
of Vocational Training

Briefing note – 9143 EN

Cat. No: TI-BB-19-006-EN-N

ISBN 978-92-896-2822-8, doi:10.2801/907856

Copyright © European Centre for the Development of Vocational Training (Cedefop), 2019.

Reproduction is authorised provided the source is acknowledged.

Briefing notes are published in English, French, German, Greek, Italian, Polish, Portuguese and Spanish, and the EU Presidency country's language. To receive them regularly register at:

www.cedefop.europa.eu/en/user/register

Other briefing notes and Cedefop publications are at:

www.cedefop.europa.eu/EN/publications.aspx

Europe 123, Thessaloniki (Pylea), GREECE

Postal address: Cedefop service post, 57001 Thessaloniki, GREECE

Tel. +30 2310490111, Fax +30 2310490020

Email: info@cedefop.europa.eu

visit our portal www.cedefop.europa.eu