Cedefop and OECD symposium
Apprenticeships and the digital transition

15 and 16 June 2023
Cedefop Thessaloniki

CEDEFOP
European Centre for the Development of Vocational Training

OECD BETTER POLICIES FOR BETTER LIVES
OECD Centre for Skills

2023 joint Cedefop/OECD symposium
Apprenticeships and the digital transition

Thessaloniki, 15 and 16 June 2023

Call for papers

To be presented at the symposium and/or included in a joint Cedefop/OECD publication

Deadline for submitting abstracts: 1 November 2022

Event page

■ **RATIONALE**

The 2023 joint Cedefop/OECD symposium on apprenticeships brings together policy-makers, practitioners and researchers from around the world to consider novel and recent research or analysis of practices focusing on how apprenticeships can respond to emerging skill needs for the digital transition, and how digitalisation can innovate the delivery of apprenticeships. The symposium also aims to discuss the implications of the extensive expansion of digitalisation in workplaces and learning environments for apprenticeship policy-making.

The past decade has witnessed a general revival of interest in apprenticeships in Europe, following a wide recognition of their potential in easing school-to-work transitions. Countries have embarked on reforms of their apprenticeship systems and schemes to give young people and adults more and better training opportunities. The reforms aim to tap the unique potential of apprenticeships for developing skills closely tied to labour market needs – including those needed for the green and digital transition, which represents major economic, societal and educational challenges and opportunities.

Digital technologies are changing the way we learn and work. Even though the ICT sector accounts for a small share (3% to 4%) of total EU employment, and digitalisation is often associated with relatively narrow and sector-specific developments, such as artificial intelligence and robotics, digitalisation permeates most economic activities and occupations, as well as everyday life. Such changes are of fundamental importance to all forms of education and training aimed at preparing people for work and continuing learning, as apprenticeship does.

The impact of digitalisation on apprenticeships may be seen both as an opportunity and as a challenge. As digital solutions are becoming the norm in facilitating learning in apprenticeships – at the workplace or the education provider premises – new opportunities arise for apprentices, education providers and participating companies, for example through new pedagogies. **The potential and importance of apprenticeship** as a pathway to acquiring digital skills (ranging from basic digital skills to highly advanced/specialised ones, including skills needed to work on new software/programmes and to use new computerised machinery) is therefore strengthened in this context. As in-company learning

constitutes a major part of apprenticeships – in many cases exceeding 50% of the overall duration – apprenticeships are uniquely positioned to allow learners to make use of state-of-the-art equipment and working methods, reducing the pressure on education institutions to replicate contemporary industrial practice through expensive workshops staffed with hard-to-find teaching professionals. In this regard, apprenticeships can provide opportunities to develop the right skills for the digital transition, both for young people in initial education and for adults in need of upskilling or reskilling.

In contrast, digitalisation is also linked to trends that **may challenge the continuing relevance of apprenticeships** for people and companies. Apprenticeships should support learners (and through them, employers) in tackling their digital skills gaps. Cedefop evidence shows that VET graduates may be more susceptible to such gaps; a higher level of digitalisation in apprenticeship content and pedagogies adds to this challenge. Existing curricula may need to be strengthened in terms of specific digital skills, but also in key competences, applied problem-solving, and basic and transversal skills traditionally provided in general education, to prepare students better for the opportunities and challenges brought about by workplace digitalisation. Digitalisation may pose additional challenges for apprenticeships, for example, when resulting in flatter work organisation models that may not allow for a meaningful master-apprentice relationship, or in lower employer investment in training, in the context of the platform economy.

In this landscape of digital transition, apprenticeship brings to the table its structured, established combination of learning across (at least) two learning venues, which helps learners develop a comprehensive set of digital skills hands-on, while enabling technology and know-how exchange between workplaces and schools. It also offers governance structures and collaboration traditions among various stakeholders, which help bridge education and employment goals, and identify drivers and benefits for learners, employers, sectors and society.

Two angles can help explore the potential role of apprenticeships in supporting and promoting the digital transition, and facing the challenges associated with it:

1. *The impact of digitalisation on apprenticeship demand (skills, qualifications)*

The growing importance of digitalisation in everyday life, workplace digitalisation, and fast-changing technologies, all require apprenticeships to adapt by providing students and workers with the necessary knowledge and skills to live and work in an increasingly digitalised world. Existing apprenticeships will need to be adapted, and new ones created for new types of jobs in the digital economy. To ensure that no one is left behind in a more digital economy and society, apprenticeship systems should pay particular attention to populations with poor digital skills and help develop them so they can fully benefit from the programme.

2. *The impact of digitalisation on apprenticeship training delivery*

Digitalisation brings new opportunities to apprenticeships by making the delivery of education and training potentially more accessible, effective and efficient, if appropriate conditions are in place for beneficiaries. Online learning, simulators, augmented and virtual reality (AR/VR), apprenticeship management systems and other technologies can have many benefits for apprentices, employers and training providers – as long as they have the knowledge and skills needed to understand and use this technology. Digital technologies in apprenticeship can also support the transition to greener economies, for example by promoting less energy-intensive ways of working among apprentices.

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In this context, the symposium organisers would welcome contributions on the impact of digital transitions in apprenticeships in two broad areas:

A. The impact of digitalisation on apprenticeship demand (skills, qualifications)

Digitalisation will have an impact on jobs across sectors and occupations, changing the way millions of people work and learn. This will in turn alter patterns of demand for both technical skills and key competences which enable workers to be effective at work, affecting people's initial education and triggering upskilling and reskilling needs. Such changes are critical to all forms of education and training aimed at preparing people for work, including apprenticeship.

In this context, apprenticeship can play a significant role in the development of skills for the digital transition, through the creation of new programmes at various education levels, and adaptation of existing ones. It can offer a response to developing sector-/occupation-specific skills, such as those needed in mechatronics and cybersecurity for example or include digital skills in curricula across specialities in a more transversal way. These digital skills – ranging from basic to advanced ones in an inter-disciplinary fashion – can help sectors innovate and be competitive in the industry 4.0 era. This way, the needs of young learners and possibly adults could be addressed, while attention could also be given to the digital skill needs of disadvantaged groups.

For apprenticeship to be able to perform this significant role, it first needs to be in a position to capture the right digital skills needed now and in the future. Thanks to multi-stakeholder dialogue, day-to-day collaboration of teachers and trainers, as well as specific skill needs anticipation mechanisms, the training offered can become more relevant and up to date.

Conversely, digitalisation could limit apprenticeship demand, as a form of training that relies on frequent, intentional and designed interaction between apprentices and in-company trainers. This relationship may be challenged in dematerialised workplaces or flatter organisational structures, even more so in the platform economy.

The following considerations could be relevant to this area.

- In what way is apprenticeship a useful, relevant and efficient policy for addressing the skill needs emerging from the digital transition, compared to other VET policies? Is it sufficiently embedded in overall strategies for digital skills development?
- What policies and practices are there to ensure that apprentices are equipped with digital transversal skills of relevance for living and working? What can we learn from these in terms of governance, processes, drivers, incentives, results?
- How can the design of apprenticeship programmes become more agile so it can be easily adjusted to changing digital skills in the future?
- At which education levels and for which population groups (young people, adults, groups at risk) can apprenticeship best address digital skill needs?
- What impact does the changing nature of the concept of 'workplace', as a consequence of digitalisation, have on apprenticeship demand?
- In what occupations with high specific digital skills is apprenticeship delivered and what is the decision process behind it? What practices, arrangements and mechanisms can help apprenticeship stakeholders select which programmes to offer, and develop the right training content to address these needs? Is the development of digital skills better suited to, or more advanced in, certain apprenticeship specialties? Are these also linked to the green transition?
- What (types of) digital skills do employers want to develop when they offer apprenticeship training? What digital skills do they expect their apprentices to have (e.g. already developed at school)? Are apprenticeships embedded in employers' digital culture? What would help employers maintain and increase their contribution in developing the digital skills of their apprentices? How can sectoral approaches help apprenticeships develop such skills?

B. The impact of digitalisation on apprenticeship training delivery

In recent years, the education technology market has grown; many education technology companies have started producing applications tailored to the needs of vocational teachers, trainers and learners, including apprenticeship management systems, simulators and virtual reality (VR) and artificial reality

(AR). A lot of the recent growth in education technologies was driven by investment in online learning tools and platforms, but investment in advanced technologies in the education industry, such as VR and AR, is likely to grow significantly in the coming years.

Technology can be integrated in various aspects of apprenticeship and contribute to making the system more accessible, attractive, relevant, transparent, effective and efficient. Rich information from various data sources and analytics on students, apprentices and graduates, as well as learning providers and employers, could be used to identify individuals who could benefit from an apprenticeship – including early school leavers, jobseekers, and those at risk of job displacement – and better match learners with learning providers and employers. Technology can improve access to apprenticeships for learners who cannot participate in in-person learning (e.g. learners in remote areas) by providing apprentices, learning providers and employers with remote connection. Other types of technology can make apprenticeships more accessible to students with disabilities, who would not be able to participate in more 'traditional' apprenticeships, and migrants without sufficient knowledge of the host country's language.

More advanced technologies, such as simulators and VR/AR, can also help to diversify training options by overcoming equipment and staff shortages that might otherwise limit what governments, learning providers and employers can offer students. Such technologies, as well as other digital resources, can also be updated and adapted more quickly in response to developments in the world of work and beyond. Moreover, technology can create innovative, cost-effective, and predictable ways to assess and certify practical skills and to monitor the effectiveness of apprenticeships. Digital technology can also improve the management of apprenticeship, by facilitating the communication between the learning venues and the learners, and by enabling better documentation and registration of learning activities, which increases the transparency and ultimately the quality of provision.

Digital technologies have the potential to make significant improvements to the delivery of education and training in apprenticeship. To yield such benefits, however, digital technologies need to be handled by technology-savvy teachers and trainers, and used by learners who are familiar with digital tools. Benefits associated with the use of technologies in apprenticeships should be carefully evaluated to identify factors that make the introduction of technologies in apprenticeship successful.

The following considerations could be relevant to this area.

- What is the use and penetration of digital pedagogies at the workplace and the training providers? What technologies are used in apprenticeship training and how widespread are they? Are apprenticeships in some sectors or fields of study more advanced in the use of technology? The use of technologies in different venues could also be discussed, such as technologies used by employers providing apprenticeship and by institutions delivering off-the-job education and training.
- How do different technologies compare to more traditional ways of apprenticeship delivery? Do they lead to better learning and labour market outcomes? Are they less expensive? Do they allow reaching out to a larger number and more diverse group of learners? What are the advantages and disadvantages of the use of simulators and VR/AR from the point of view of the two learning venues?
- What are the factors that are required for technologies to be successful in apprenticeship delivery? What are the barriers to effective adoption and use of technologies in the different learning venues of apprenticeships?
- Which enabling factors can support a smooth introduction of digital technologies in apprenticeships targeting disadvantaged populations (e.g. adults with basic skills gaps)?
- Which policies have been successful in increasing the use of technologies in apprenticeship training?
- How can technology use in apprenticeship support the transition to greener economies?

■ ABSTRACT SUBMISSION

Academics, researchers, experts, policy officials, professionals in fields relevant to the call, workers' and employers' representatives interested in the topics above are invited to submit the following using the abstract submission form:

- an abstract (max. 600-800 words) of their proposed paper in English: the proposal should include a clear link between apprenticeships and the digital transition (i.e. not any type of education/training, or any type of skills development);

- contact and professional details, including current affiliation and position, and, if relevant, main publications;

- their acknowledgement of the 'Terms of licence' that will apply to the publication.

The form should be submitted by **1 November 2022** only via email to apprenticeship-team@cedefop.europa.eu.

By submitting their abstracts, authors/authoring teams agree that if accepted, their papers can be included in the joint Cedefop/OECD publication according to the 'Terms of licence'. Some of the papers accepted may also be presented during the symposium, subject to its duration/agenda restrictions.

The Privacy statement describes processing of personal data in the context of this call.

■ DRAFT FULL PAPER SUBMISSION

A Cedefop/OECD panel will consider submitted abstracts and select by **15 December 2022** those most suitable for the symposium and the subsequent dedicated publication according to the following criteria:

(a) relevance to the scope and aim of the call/policy relevance
(b) proposed evidence basis
(c) methodology and analytical approach
(d) appeal to an international audience

Authors of accepted abstracts will be asked to submit a draft full paper by **1 March 2023**, based on paper guidelines that will be communicated by Cedefop/OECD. Draft full papers are expected to be in the area of 5 000 words (including references).

■ PRESENTATION AND PUBLICATION

All accepted papers will be included in a publication that will be finalised after the symposium, provided that they meet the quality criteria set in the paper guidelines. Cedefop and the OECD will provide feedback to authors on their full papers ahead of the publication.

Some of the papers accepted will be presented during the event, subject to duration/agenda restrictions. For this purpose, authors will also be asked to submit a draft presentation by 9 June 2022, based on presentation guidelines that will be communicated by Cedefop/OECD. Cedefop and the OECD will review the papers and presentations and provide a first round of comments on both in view of the symposium.

■ TIMELINE

Deadline for abstracts   1 November 2022

Selection of abstracts to be further developed	15 December 2022
Deadline for draft full papers of accepted abstracts	1 March 2023
Deadline for draft symposium presentations	9 June 2022
Symposium	15 and 16 June 2023
Deadline for final full papers	September 2023 (provisional, tbc)
Estimated publication date	January 2024 (provisional, tbc)

■ **CONTACT**
For more information, please visit the event page or contact apprenticeship-team@cedefop.europa.eu

About Cedefop
Cedefop is one of the EU's decentralised agencies. Its mission is to support the promotion, development and implementation of EU policies in the field of **vocational education and training, skills, and qualifications** by working together with the European Commission, the Member States and the social partners.

Cedefop work on apprenticeships
Within the EU policy framework, Cedefop carries out activities across countries and within single Member States to provide evidence to support policy-making at the EU and national levels and to support European cooperation on apprenticeships among Member States. Since 2014, Cedefop has carried out Thematic country reviews on apprenticeships in nine countries. With dedicated policy learning forums, Cedefop supports countries in exchanging and generating knowledge on apprenticeships to take their reforms and policies further. In 2018, Cedefop published the European Database on apprenticeship Schemes and set up Cedefop's community of apprenticeship experts. Cedefop's EU-wide comparative study on apprenticeship schemes (2018) provides a mapping and comparative analysis of system level apprenticeships which share selected common criteria. Cedefop's work includes topics such as: apprenticeships for adults (2019), the impact of COVID-19 on apprenticeships (2020), financing apprenticeships (2020), apprenticeship participation (2021) and quality (2021), apprenticeship governance and in-company training (2021), enablers and disablers of cross-

About the OECD
The mission of the OECD is to promote policies that will improve the economic and social wellbeing of people around the world. The Organisation works with partners, in particular 38 member countries, to share experiences and seek effective solutions to common problems.

OECD work on apprenticeships
Over the last decade, the OECD has undertaken considerable work on vocational education and training (VET). The VET team in the OECD Centre for Skills has been responsible for more than 50 reviews of national VET policies (www.oecd.org/edu/vet). Insights from country studies have informed a series of cross-national thematic studies exploring the characteristics of effective policy on VET, including Learning for jobs (2010), Skills beyond school (2014) and, in 2018, Seven questions about apprenticeships: answers from international experience. The latter study drew on national experience to conceptualise and evidence effective apprenticeship design, exploring key questions such as whether employers should receive financial incentives to take on apprentices, how long apprenticeships should last and how apprenticeships can best be designed to meet the needs of youth at risk of poor outcomes. Recent country reviews with strong focuses on apprenticeship provision include reviews of England (2018), Israel (2018),Scotland (2020) and Brazil (2022). The recent report Pathways to professions: understanding higher vocational and professional tertiary education also provides insights into the use of apprenticeship at

border long-term mobility of apprentices followed by policy messages (2021), the role of apprenticeship in greening economies and societies (2022), and the vision and function of apprenticeship in Europe and its resilience in times of crisis (2022).	the tertiary education level. The OECD also fosters the development and collection of more and better data and indicators on VET and apprenticeships. The working paper Improving evidence on VET: comparative data and indicators (2020) identified key data gaps in the area of apprenticeships and sets out proposals for better definitions and data collection.

Joint Cedefop/OECD work on apprenticeships

In 2019, Cedefop and the OECD organised a joint symposium on 'The next steps for apprenticeship'. The subsequent joint publication on the same topic offered insights from 16 papers by researchers from Europe, Australia and the United States on the future of apprenticeship from the perspective of emerging policy objectives, new approaches to education and training and external megatrends (e.g., sociodemographic changes, the accelerated adoption of emerging technologies and new forms of work organisation).

In 2021, Cedefop and the OECD organised a joint symposium on 'Apprenticeship for greener economies and societies'. The subsequent joint publication on the same topic draws from practices and research and provides insights into how apprenticeships can promote and react to a green economy and society, from small-scale modular curriculum adaptation, to more encompassing sectoral or regional approaches.