EAfA

Digital Skills in Apprenticeships

Toolkit for VET providers and companies

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Introduction to the European Alliance for Apprenticeships toolkits

The European Alliance for Apprenticeships (EAfA) is a flagship initiative of the European Commission. It brings together policymakers and key stakeholders to strengthen the quality, supply and overall image of apprenticeships, while also promoting apprentices' mobility.

Over the years, EAfA has produced online resources and organised activities and events to tackle key issues related to quality apprenticeships. It has also provided EAfA members with opportunities to connect and exchange ideas and good practices.

The EAfA toolkits represent an online resource providing advice and steps designed to support individuals and stakeholders to implement, improve and assess a measure, activity, action, or programme. More specifically, EAfA toolkits aim to:

- increase knowledge of key aspects of quality apprenticeships among EAfA members and the broader community of stakeholders involved in vocational education and training (VET) and work-based learning;

- improve the quality of apprenticeships on-the-ground and promote coherent approaches across the European Union (EU);

- provide concrete and tailored guidance on specific issues related to quality apprenticeships, directly responding to the needs of different stakeholders;

- encourage mutual and peer learning, including through the promotion of good practices on selected issues.

Digital Skills in Apprenticeships Toolkit

Digital skills have become key prerequisites to successfully navigate the labour market. This toolkit is designed to help you maximise the benefits of the digital transformation, by gaining a better understanding of how to support digital skills development through apprenticeships, in terms of learning pathways, competence development, and digital infrastructure.

Spotlight on digital skills in the EU

According to the Digital Economy and Society Index (DESI), only 55.6 % of EU citizens have the basic digital skills needed to navigate the world we live in. Young people aged 16-24 generally have higher levels of basic digital skills compared to those aged 55-74. However, growing up in a digital world does not necessarily make you digitally savvy, as other elements can affect a person's digital skills development. For instance, a large gap exists between rural and urban areas, with only 47.5 % of individuals living in rural areas having at least basic digital skills compared to 62.55 % of people living in urban areas. Furthermore, education levels can also play a role, with individuals with high formal education generally having acquired more basic digital skills[1].

Moreover, only 55 % of small and medium-sized enterprises (SMEs) have integrated basic digital technologies into their work, with substantive differences across countries in the EU (e.g. Sweden and Finland have the most digitalised businesses, whereas Romanian and Bulgarian SMEs report the lowest levels of digitalisation). Among small and medium-sized enterprises (SMEs), 45 % say that skills shortages hold their company back in adopting or using digital technologies[2]. Low levels of digitalisation and digital skills mean that a large number of EU citizens risk being excluded from the labour market or find it more difficult to get a job, and that European businesses may not be ready to take advantage of the opportunities made possible by digital technologies. These combined challenges make it even harder to respond to changing labour market needs, with negative impacts on both the economy and social cohesion.

While these are critical challenges, the EU has been taking action to support businesses and citizens to develop digital skills through policies and strategies, including:

- Europe's Digital Decade Framework setting the objectives of ensuring that at least 80 % of the EU population can use tech for everyday tasks, and having 20 million employed ICT specialists (with a better representation of female graduates) by 2030.

- The European Skills Agenda includes several actions to promote the upskilling and reskilling of the population, including boosting skills for the digital transition.

- The Digital Education Action Plan (2021-2027) provides a common vision of high-quality, inclusive and accessible digital education in Europe, and identifies fostering the development of a high-performing digital education ecosystem[3] and enhancing digital skills and competences for digital transformation as key priorities.

- The 2020 Council Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience highlights the role of VET as a driver for innovation and growth and as key for the acquisition of skills for the digital and green transitions. Moreover, the 2023 Council Recommendation on the key enabling factors for successful digital education and training identifies connectivity, equipment, and teachers' digital pedagogy as crucial to ensuring universal access to digital education. Furthermore, the 2023 Council Recommendation on improving the provision of digital skills and competences in education and training mentions the role that apprenticeships can play in supporting learners to develop advanced and specialist digital skills.

- The European Framework for Quality and Effective Apprenticeships (EFQEA) encourages EU Member States and key stakeholders to "ensure that apprenticeship schemes are responsive to labour market needs" and calls for the establishment of support services to respond, inter alia, to the training needs of VET teachers and trainers in relation to digital innovations in apprenticeships.

Furthermore, the EU has allocated significant funding to digital skills, including through the Recovery and Resilience Facility (RRF), the European Social Fund Plus (ESF+), the Digital Europe Programme, and Erasmus+ (more information below).

To better understand challenges and identify effective solutions, it is important to start by clarifying some key concepts.

- **Digital transformation or transition:** The integration of digital technologies by companies and their impact on society.

- **Digital skills:** A range of abilities to use digital devices, communication applications, and networks to access and manage information.

- **Digital competences:** The confident, critical and responsible use of, and engagement with, digital technologies for learning, at work and for participation in society. It is defined as a combination of knowledge, skills, and attitudes[4].

- **Digital literacy:** The ability to access, manage, understand, integrate, communicate, evaluate, create, and disseminate information safely and appropriately through digital technologies. It includes competences that are variously referred to as information literacy and media literacy, computer, and ICT literacy[5].

- **Digital divide:** The distinction between those who have access to the internet or other digital technologies and are able to make use of online services, and those who suffer exclusion from these services[6].

Digitalisation can shape apprenticeships in a variety of ways:

- **Digital skills in apprenticeships:** these are apprenticeship opportunities offered across all industries and sectors, where digital skills can be mainstreamed as part of the learning pathway of apprentices. Through these apprenticeships, learners can develop a wide range of digital skills that can be helpful to navigate the labour market. These can also entail using new technologies (e.g. VR, AR, AI) as learning tools.

- **Apprenticeships in the ICT/tech sector:** these are apprenticeship opportunities within the ICT/tech sector that provide apprentices with technical digital skills in areas such as data management, cybersecurity, networking, installation, etc.

- **Online/distance learning as part of apprenticeships:** these are apprenticeship opportunities offered as online courses. These types of apprenticeships take advantage of digital tools to increase accessibility by allowing apprentices to participate regardless of their location, but it does mean less opportunities to interact and network with other fellow apprentices and colleagues, which constitutes a crucial benefit of work-based learning.

This toolkit is primarily focused on the first category as it aims to provide guidance on how to introduce and mainstream digital skills into existing apprenticeship programmes but also covers some useful elements for the other categories.

Who is this toolkit for?

This toolkit provides support and guidance to **VET providers** and **companies**.

It enables them to access practical examples and concrete guidance on how to best design, set up, and implement initiatives that can support all stakeholders involved in apprenticeships (i.e. VET providers, companies and apprentices) to develop digital skills.

How is this toolkit structured?

The toolkit is divided into three main sections, reflecting the main stages of introducing digital skills in apprenticeships:

- **Planning and assessing digital skills:** This section focuses on the steps needed to identify digital skills needs to shape learning pathways.

- **Building internal capacity for digital skills**: This section provides advice on how to ensure that digital tools and equipment are available to trainers and apprentices.

- **Designing and implementing programmes:** This section provides guidance on identifying the most relevant digital technologies and tools, designing apprenticeship programmes, and ensuring the recognition of the digital skills developed through work-based learning.

Under each of the above stages, the toolkit provides relevant resources to tap into and examples to take inspiration from, as well as a checklist for VET providers and companies to assess their progress.

Tips and Tricks

Though enabling digital skills acquisition through digital leaning tools can bring many benefits, it also comes with challenges. Here are some tips and tricks about how to tackle them.

1 The digital transformation advances at an incredibly fast pace, and it can be hard to keep up. To make sure that apprenticeships continue to offer valuable learning experiences, it is important to try to understand the evolving needs of the labour market, by taking advantage of the many resources available at EU level on skills intelligence and skills anticipation.

2 Introducing digital skills in apprenticeships can provide crucial support to both young and adult learners. Young people can make use of apprenticeships to strengthen their profile for a smoother school-to-work transition, while adult learners can upskill and reskill to remain relevant in an ever-changing labour market.

3 Taking into account organisational and sectoral needs does not mean that apprentices' interests should be forgotten. Even when focusing on digital skills, it is crucial to make sure that apprenticeships programmes continue to be learner-centred, and that, with the help of professional teachers and trainers, apprentices are involved in shaping learning pathways, assessing their own digital skills levels and helping them acquire digital competences that will support them to enter the world of work.

4 Digital learning alone does not improve teaching and learning[7] – what matters is how teachers/trainers use it[8]. It should always be seen as an extra tool in teachers'/trainers' toolboxes; and teachers and trainers should remain central.

5 One of the key benefits of apprenticeships is the real-world experiences they provide. Though it can be advantageous sometimes to use digital learning tools to decouple learning from time and place, the physical experience of the workplace needs to be preserved. Working in a real workplace is especially key to developing essential transversal skills. Digital learning tools should be carefully integrated into apprenticeships where they add value.

6 It can be difficult to understand the benefits and downsides of digital tools in the growing private EdTech market and care has to be taken not to get locked into the offers of particular vendors that might later restrict choice. It is important that VET providers and companies work together to understand what digital tools are needed and how they can best be sourced.

7 Keeping up to date with emerging technologies can be a real challenge. 'Hype cycles' in which initial over-optimism about a technology eventually gives way to disappointment have been an unfortunate characteristic of digital learning[9]. Awareness of this, however, means a measured approach can be taken to adopting new tools.

8 The capacity of the latest wave of technologies to 'crunch' data raises important questions about what data about apprentices is gathered and how it is used. This raises ethical questions about data privacy and how teachers should use data. Outside education, issues of bias have been prominent for some years. Awareness of such issues should be promoted among teachers and trainers.

"

Ensuring positive outcomes for employers, VET providers and apprentices requires considering both digital skills needs of the market and requirements under existing qualifications offer "

The three stages of introducing digital skills in apprenticeships'

Stage 1

Planning And Assessing Digital Needs

Step 1

Identifying digital skills needs

Step 2

Conducting assessments or audits of digital skills needs

Step 3

Building partnerships

Stage 2

Building Internal Capacity for Digital Skills

Step 4

Identifying training needs of teachers and trainers

Step 5

Providing training to teachers and trainers

Step 6

Developing the digital infrastructure

Step 7

Accessing financial support for digital skills

Stage 3

Designing and Implementing Programmes

Step 8

Identifying relevant digital tools and technologies

Step 9

Introducing digital skills in learning agreements

Step 10

Designing learning activities

Step 11

Capturing and recognising apprentices' digital skills achievements

Stage 1:

Planning And Assessing Digital Needs

Introduction

Why should digital skills be integrated into apprenticeships?

Introducing digital skills in apprenticeships can bring benefits to all stakeholder groups involved:

- **Companies** benefit from having the opportunity to directly train the current and future European workforce and ensure that apprentices, as well as their own staff, develop the digital skills that businesses need, bridging current gaps in the labour market. Investing in digital skills training through apprenticeships can also boost innovation by engaging with apprentices who will have been exposed to new tools and technologies themselves and can bring new ideas.

- **VET providers** benefit from introducing digital skills into apprenticeships as they can improve the quality and attractiveness of their training programmes.

- **Apprentices** of all ages can benefit from digital skills being introduced in apprenticeship opportunities as they have the chance to develop the competences that will boost their employability and success in the labour market.

In addition, mainstreaming digital skills in apprenticeships can result in several **benefits for society** as a whole:

- **Addressing the digital divide:** Developing digital skills through apprenticeships can help close the digital skills gap, contributing to improving social cohesion in the long run.

- **Contributing to boosting prosperity:** Addressing digital skills gaps through apprenticeships not only supports individual career growth but can also provide a critical contribution to the European economy by addressing the current lack of a digitally skilled people, which affects, for example, innovative services provision and competitiveness.

- **Improving the image of apprenticeships:** By making apprenticeships a key pathway for a digitally empowered future workforce, their image, reputation, and attractiveness for learners and employers can be improved. The introduction of digital skills can both modernise existing apprenticeships programmes to keep up with labour market changes, and expand the reach of apprenticeships by increasing their relevance for new occupations stemming from the digital transformation[10].

- **Contributing to the digital and green transitions:** By enhancing digital skills and learning how to make use of new technologies and tools, apprenticeships can not only become a force in supporting the digital transformation, but can also encourage the use of innovative approaches to increase the sustainability of current practices, thus making a positive impact on the green transition too.

Introducing digital skills into apprenticeships requires both VET providers and companies to take formal steps to understand their own needs with regards to digitalisation and digital skills to effectively shape training paths. In the sections to follow, you will find a series of suggested steps to integrate digital skills into your apprenticeship offer.

> " Partnership building with specialised organisation can enhance your training offer "

Steps to Follow

Identifying digital skills needs

Step 1

Companies and VET providers wishing to include digital skills in apprenticeships should first aim to understand what types of digital competences can and should be mainstreamed through their training offer.

More specifically, this first step requires deciding whether the apprenticeship will support learners to develop:

- **Basic digital skills:** These entail learning how to use digital devices (e.g. computers, laptops, tablets, mobile phones etc.) for work tasks; searching for reliable information online; behaving safely and legally online; and communicating professionally using emails or other types of messaging/meeting/presentation platforms or social media. These basic skills include familiarity with common software and systems. Critically, this requires practical knowledge of interaction between software, operating systems and file management to achieve a desired outcome.

- **Advanced digital skills:** These entail either learning how to use new and emerging technologies (e.g. artificial intelligence (AI), virtual reality (VR), augmented reality (AR), extended reality (XR)), as well as digital content creation, e-commerce/marketing, data analytics, that can be applied to a wide range of professions across industries; or developing skills and competences to use job-specific technologies within a given sector.

Spotlight on SELFIE WBL and DigComp

The SELFIE for work-based learning (SELFIE WBL) – a module of the SELFIE tool – is a free online tool supporting VET schools and companies to make the most of digital technologies for teaching, learning and training.

To achieve this, SELFIE WBL takes a snapshot of the VET school or company use of digital technology for training by collecting the views and experiences of school leaders, teachers, learners and in-company trainers. This evidence is used by the tool to develop a tailor-made report on the use of digital technologies within the company or school, with a focus on the following key areas: leadership; infrastructure and equipment; professional development; implementation in the classroom; support and resources; assessment of practices; students' digital competence; and network and collaboration. Guidance on how to use SELFIE WBL is available here and an example of a SELFIE school report can be found here.

The Digital Competence Framework for Citizens, also known as DigComp, is an EU-wide tool that provides a common language to identify and describe the key areas of digital competence. DigComp outlines five areas that comprise digital competence:

1. Information and data literacy: This includes articulating information needs, locating and retrieving digital data, information and content; as well as judging the relevance of the source and its content, and storing and managing digital data, information and content.

2. Communication and collaboration: This entails interacting, communicating and collaborating through digital technologies, and managing one's digital presence, identity and reputation.

3. Digital content creation: This revolves around creating and editing digital content, and/or integrating information into an existing body of knowledge, including by using computer systems.

4. Safety: This entails protecting devices, content, personal data and privacy in digital environments.

5. Problem solving: This includes resolving conceptual problems and problem situations in digital environments and/or using digital tools to innovate processes and products.

For each area, DigComp lists specific competences and skills to be developed. In March 2022, DigComp was updated to DigComp 2.2. to consider emerging technologies (e.g. AI, datafication) and ongoing trends such as increased teleworking, disinformation and the new skills requirements they bring. As such, it can be a useful tool to help VET providers and companies develop and implement apprenticeship programmes and curricula that support digital competence building, and improve the digital competence of apprentices. DigComp has also been used for the development of several digital skills assessment tools, including DigSat which allows users to test their digital skills across the five key areas outlined in DigComp.

Furthermore, VET providers and companies should gain an understanding of existing requirements under qualification frameworks in the country they operate in, to check whether and how digital skills needs are included. This will allow them to identify how to best introduce digital skills in apprenticeship programmes, to both comply with national systems and, to the best extent possible, respond to industry needs. This can be challenging as it requires curricula and qualification frameworks to be regularly revised and updated to respond to the changing needs of an increasingly digitalised world of work.

Good practice examples: Digitalisation in VET curricula and strategies

While VET curricula and qualification frameworks struggle to keep up with the fast pace of digital and technological developments, examples of VET policies and strategies where new technologies have been promoted can be found[11]:

- Germany's Federal Institute for Vocational Training (BIBB) has been adopting new training regulations and revising existing ones to ensure VET keeps up with new labour market needs, including those brought by the digital transformation[12]. For example, in 2018, a new regulation was adopted to add digital competences to the VET school and company apprenticeship training curricula for the metal and energy industries[13]. Moreover, from 2021 onwards, training regulations for all job profiles must comply with a set of minimum requirements under four key areas, including digitalisation[14].

- Denmark's latest digitalisation strategy recognises the importance of VR and AR in VET and apprenticeships by stressing that inclusive technologies strengthen the link between theoretical training in school and practical training in the enterprise.

- Under Lithuania's Next generation Lithuania plan, the Green and digital competences for vocational training initiative refers to the use of VR and AR in distance learning to make VET more flexible and accessible, with the aim of updating curricula for occupations included in the recently launched Vocational training advancement platform.

More information on existing regulations on apprenticeships can be found in these country reports developed by Cedefop. Furthermore, this page includes country reports on VET and the future of work, including information on to what extent/ how digital skills are integrated in curricula.

Moreover, to ensure learning pathways are meaningful and can lead to positive outcomes for employers, apprentices, and society as a whole, companies should look into what digital skills are needed in their sector for businesses to remain competitive, and VET providers should conduct research to gain an understanding of the digital skills required for workers to attract potential employers. In this way, apprenticeship offers will support businesses to grow and retain much-needed talent they helped to train themselves, and VET providers will provide their learners with concrete help when entering the labour market.

Different tools and initiatives at EU level can support skills anticipation and intelligence. For instance, Cedefop's Skills Intelligence online tool provides information on current and future skills and labour market needs in EU Member States, sectors and occupations. It allows users to look up specific skills intelligence, for example, on occupational profiles within Member States and sectors. Companies and VET providers can take advantage of this tool to identify digital skill trends in the sectors and/or countries they operate in. To this end, the Digitalisation and Technology Dashboard and the Digital skills level indicators can provide particularly useful information.

Cedefop's Skills Forecast tool can also be of help to VET providers, as it offers quantitative projections of future trends in employment by sector of economic activity and occupational group. Lastly, Cedefop's Skills OVATE tool provides detailed information on the jobs and skills employers are demanding based on online job advertisements (OJAs) in 32 European countries. Furthermore, Cedefop's second European Skills and Jobs Survey (ESJS2) results offer data from the EU-27, Iceland and Norway which is relevant to understand the impact of digitalisation on the future of work and skills. While it is at the national level that curricula and qualifications must be updated, these tools can be very useful to VET providers looking to enhance digital skills in their training programmes to ensure these can help learners to develop the digital skills and competence that will be needed in the labour market of the future.

Spotlight on Blueprints

The Blueprints for Sectoral Cooperation on Skills, financed under Erasmus+, support skills development, upskilling and reskilling. The existing Blueprint Alliances gather different types of stakeholders (e.g. businesses, trade unions, research institutions, education and training providers, and public authorities) to develop and implement strategies to address skills gaps in specific sectors. All Blueprint Alliances are expected to gather skills intelligence for the sector they operate in, develop a skills strategy, and design concrete education & training solutions for quick take-up at regional and local level, and for new occupations that are emerging. As such, the work of the Blueprint Alliances can provide useful insights into existing and future skills needs that could be addressed through apprenticeships and might offer ideas for developing learning pathways for digital skills. Examples include:

- B-WISE – a Blueprint project aiming to develop a European strategy to address skills needs, in the Work Integration Social Enterprises (WISEs) sector – published a report on trends and challenges for WISEs in Europe with a focus on the digital area. Another report explores user digital skills needs in WISEs.

- The Next Tourism Generation Alliance (NTG) developed a research-based Skills Assessment Methodology (SAM) to support the tourism industry, education and training providers as well as government bodies to systematically identify, assess and monitor digital, green and social skills needs.

More information on the work of the existing Blueprint Alliances can be found on this webpage, as well as in the 'Bridging projects and policy: Blueprints for sectoral cooperation' paper.

Conducting assessments or audits of digital skills needs

Step 2

Aside from better understanding industry, sectoral, or regional needs, it is always important for companies to carry out a digital skills assessment to **identify what digital skills are already being used within the business, as well as potential gaps in the digital competences of current staff**. This can help orientate training programmes as it provides information on what digital skills can be fostered through apprenticeship programmes to continue to build on existing skillsets or tackle gaps.

Company-level digital skills audits or assessments can be conducted in several ways. The easiest options include carrying out an employee survey or focus groups/interviews, or a mix of the two – depending on the size of the business and the resources available for this work. Furthermore, job descriptions can also be reviewed to gain an understanding of the required digital skills for existing positions. Concrete steps include:

- Listing the various roles and positions held by current employees within the company;

- Listing the digital skills required for each role;

- Consulting employees (e.g. surveys, focus groups, interviews) to get their feedback on digital skills needed to carry out their job;

- Analysing the data and feedback gathered.

It can also be helpful to develop a 'digital skills matrix' to organise the data and have a clear map of existing digital skills being used by the business as well as potential gaps. The matrix can be a simple table (see example below) listing the different roles and digital skills/competences required for each job role, and could be further developed to include an assessment of the skills/ competence level (i.e. basic/intermediate/advanced). Companies can treat their digital skills matrix as a living document and update it regularly over time.

Figure 1 – Example of a digital skills matrix

	Digital skills		
	Digital skill #1	Digital skill #2	Digital skill #3
Job role #1			
Job role #2			
Job role #3			

Carrying out a digital skills needs assessment or developing a digital skills matrix can provide helpful information to shape apprenticeship offers so that these either address existing gaps or further build on in-company strengths.

Building partnerships

Step 3

Integrating digital skills into apprenticeships requires **VET providers and employers to work closely together**. This process can be further facilitated by partnering with organisations that can provide technical expertise and/or equipment and infrastructure (e.g. specific software or tools). For instance, **partnering with ICT training centres or tech companies** can allow VET providers and employers to strengthen their apprenticeship offer by providing training for highly specific digital skills that are needed in the labour market. Furthermore, partnering with EdTech companies may facilitate the identification of tools, software and technology best suited to achieve the educational objectives of apprenticeships. Moreover, these organisations might also be able to provide certifications, allowing learners to further enrich their profile and increase their chances of finding employment.

Good practice example: Boosting digital skills through partnerships

The ALLVIEW project, supported by Erasmus+, brings together 22 partners (e.g. sectoral associations, VET providers, VET authorities, sector research and innovation centres) from eight countries to build a Centre of Vocational Excellence (CoVE) for the European wood and furniture industry[15]. The project aims to modernise VET in the sector by developing several activities and tools, including using AI and machine learning for skills anticipation; and creating new curricula, tools and teaching methods making use of new technologies (e.g. AR, VR).

Examples of the work carried out to date include a mapping of existing industry 4.0 learning resources, and a report on the integration of VR and mixed realities (MRs) as complementary tools in curricula. Furthermore, the ALLVIEW project set up a collaborative platform for training providers, companies, workers and learners to connect.

Lastly, partnership building can also facilitate access to **mobility opportunities**, which can allow sending/hosting VET provides and businesses to either provide apprentices with opportunities to improve their digital skills by spending a period of time abroad in another company, or host learners from another country to give them the chance to benefit from digital skills training opportunities that VET providers or companies have developed. The EAfA Mobility of Apprentices Toolkit offers some guidance on how to build partnerships for mobility.

Spotlight on EU partnerships

The Pact for Skills brings together key stakeholders interested in upskilling and reskilling across Europe. Members include public authorities, companies, social partners, cross-industry and sectoral organisations, education and training providers, employment services. Under the Pact, member organisations can set up and join:

- Large-scale skills partnerships (LSPs): These bring together major players in individual industrial ecosystems to cooperate to provide upskilling and reskilling opportunities. An example is the Digital Ecosystem LSP, that has committed to develop a joint strategy for upskilling and reskilling and enhance cooperation among members.

- Regional skills partnerships (RSPs): These can cover a region within a single country, 'macro regions' spanning across Member States that have a shared geographical or economic relationship or bring together different regions facing similar skills challenges.

If you are interested in joining the Pact for Skills, you can find more information here.

Checklist

Have you taken all the necessary steps to integrate digital skills in your apprenticeship offer? Fill in the checklist below and decide!

	Steps	Yes	No	Comments
A	Gathering skills intelligence on digital skills needs in your sector	○	○	
B	Assessing existing roles and positions in your organisation / sector and listing digital skills needed for each	○	○	
C	Consulting employees on digital skills needed to carry out their job (e.g. via surveys, interviews, focus groups)	○	○	
D	Developing a digital skills matrix to assess existing digital skills and / or gaps	○	○	
E	Deciding whether to focus on basic or advanced digital skills in your apprenticeship offer	○	○	
F	Establishing partnerships with ICT training centres / tech companies	○	○	
G	Assess possibility to join existing EU level partnerships	○	○	
H	Establishing partnerships with VET providers / companies abroad to access mobility for digital skills	○	○	

Digital skills in apprenticeships improve employers' competitiveness, make training more attractive, and boost apprentices' employability

Stage 2:

Building internal capacity for digital skills

Introduction

Introducing digital skills in teaching and learning through apprenticeships is crucial but will not get companies and VET providers very far if it is not paired with the necessary infrastructure to be able to use technology. Equally, training providers and businesses must develop their own internal capacity and the competences of their own staff to be able to introduce digital skills in apprenticeships.

There are several steps that can be taken by VET providers and businesses to develop the necessary skillsets to shape learning pathways for apprenticeships to acquire digital skills, and to ensure that digital tools and equipment are available to trainers and apprentices.

Steps to Follow

Step 4

Identifying training needs of teachers and trainers

To be able to integrate digital skills in apprenticeship programmes, VET providers and companies must ensure that their own team possesses the necessary expertise and knowledge to share with learners. More specifically, necessary competences and expertise should include both subject-matter knowledge (e.g. knowledge of digital skills and / or technologies to perform occupation-related tasks); ability to apply competences in a digital context (e.g. apply communication skills while using digital technologies); and overall knowledge/capacity/readiness to support teaching and training (e.g. ability to use e-logs to monitor training, or ability to use web-based training resources etc.)[16].

If gaps exist, then these should be addressed before building digital skills into apprenticeship offers. To this end, internal assessments or audits of teachers' and trainers' digital skills (see step 2) can be very helpful to assess existing competence levels and identify potential gaps or training needs among educators and trainers (in both VET providers and companies).

Another avenue is represented by self-assessment tools, which can help teachers and trainers to test their own digital skills and competences and decide whether they need additional training. As mentioned above, SELFIE WBL is an example of a self-assessment tool for VET schools and companies through which teachers, in-company trainers, and learners answer questions to assess their organisation's digital readiness, resulting in a tailored report making it possible to identify strengths and weaknesses and possible next steps.

Identifying training needs can help companies and VET providers to develop their own 'action plan' to address existing digital skills gaps.

Spotlight on self-assessment tools

The European Commission has developed several self-assessment tools that can be helpful to VET providers and their teachers as well as companies and their trainers. Aside from the above-mentioned SELFIE WBL, other tools include:

- SELFIE for TEACHERS: This is an online tool for primary and secondary school teachers, developed by the European Commission in cooperation with experts, teachers and policy makers. The tool allows teachers to self-assess their digital competence and plan their own learning according to the results. It includes 32 items (statements) corresponding to the six areas and 22 competences of the DigCompEdu framework and incorporates the latest developments in digital education (e.g. computational thinking, online and blended learning, emerging technologies and AI). More information on how to use the tool can be found in this toolkit.

- DigSAT: This is an online tool available on the Europass webpage, allowing users to test their digital skills across five key areas (information and data literacy; communication and collaboration, digital content creation, safety, problem solving). After completing the test, users can add their digital skills to their CV and receive suggestions on courses and learning opportunities based on their results.

Some examples also exist at the national level. For instance, in France, the Hybrid'Box initiative supported by the Ministry of Labour provides Apprentice Training Centres (CFAs) with diagnostic tools to assess their ability to transform and to take stock of their digitalisation through questionnaires and reports providing guidance for further action, as well as tools (e.g. grids to define needs and identify expenses to address them; and a map of funders)[17]. Furthermore, examples of other self-assessment tools developed through projects and initiatives include the following:

- Digital Competence Test: A platform offering self-assessment tests and providing personalised reports on key areas for further training.

- Digital Competence Wheel: A self-assessment tool providing an overview of individual levels of digital knowledge and generating an interactive report highlighting strengths and areas for improvement.

Providing training to teachers and trainers

Step 5

Once training needs have been identified, **capacity building opportunities** should be provided to teachers and trainers. This is crucial to ensure that all teachers and trainers possess the necessary knowledge and competences to use digital equipment and tools and confidently support apprentices to develop their digital skills. The provision of formal skills development opportunities should be part of a broader commitment to skills management at organisational level, which entails providing appropriate training opportunities based on gaps identified through analysis and planning. To this end, it is also important to consider that accessing funding for upskilling and reskilling (step 7) and partnership building (step 4) can also facilitate the provision of training opportunities. These country reports developed by Cedefop, furthermore, provide examples of and helpful information on existing policies and support available for teachers and trainers to build their capacity to adapt to the changing world of work.

Aside from formal training, there are several initiatives, platforms and tools that can be accessed online and provide free resources (e.g. training, handbooks, toolkits) as well as virtual communities to share experiences, challenges, and lessons learned. These are available either in English or individual national languages, depending on whether they are developed by international/European, or national organisations, and can be very useful for teachers and trainers to feel better prepared to tackle digital skills.

Spotlight on learning platforms

Digital Skills & Jobs Platform

The platform includes a training section collating training opportunities on digital skills and emerging technologies from all around Europe (e.g. online courses, professional training, and wider education programmes) as well as in various fields.

Electronic Platform for Adult Learning in Europe (EPALE)

EPALE includes a dedicated course catalogue, with training opportunities, both online and in-person. While the platform targets adult learning professionals, it can offer valuable capacity building opportunities for organisations and individuals working on apprenticeships.

Digital SkillUp

This online portal aims to make knowledge on emerging technologies accessible and easy to comprehend for everyone and targets SMEs and citizens. It offers both online courses to provide users with basic knowledge around the digital transformation as well as a training course catalogue on digital skills and emerging technologies.

Equally, working with apprentices can be an opportunity for VET providers and companies to learn from them and their existing digital skills. For example, apprenticeships can be an opportunity for companies to bring together the digital know-how of apprentices with the professional experience of older workers in 'age-diverse' teams and 'reverse mentoring' processes[18].

Step 6

Developing the digital infrastructure

VET providers and training companies will need **appropriate infrastructure to support the goals of digital skills development**. Indeed, in many ways, they will need to undergo a digital transformation to put in place the technologies required. This is important not just because of the infrastructure demands of new technologies impacting the workplace. It is also important because it will help to close the gap between the digital world of young people and the digital world they often experience in VET schools[19] ; and because it has the potential to bring general benefits in terms of the efficiency and effectiveness of learning processes.

There are various aspects to infrastructure development to consider. First, VET providers and companies may need to **review their digital capacity** to ensure it can support the latest technologies. Many providers have kept up to date with the need for increased bandwidth linked to the growing use of online resources. However, the use of cloud-based services and of software that blurs the physical-virtual divide may require a step-up in digital infrastructure to provide the bandwidths and speeds to enable apprentices to be able to experience the latest learning tools properly. AI-based software will require a shift from current 'cellular networks' to new wireless access technologies which may include access points embedded in VET schools and companies (the 'Next Internet')[20] .

Secondly, and linked to the above, a stronger focus on digital skills may require VET providers and companies to further invest in **new equipment and tools**. This is a step that should not be underestimated as it is crucial to make sure that teachers, trainers and apprentices have access to the right tools for teaching and learning in a digital environment. The types and amount of new equipment to be purchased will depend on the digital skills to be developed, the specific sector, the size of the VET provider / company, and the number of apprenticeships offered.

It is important to remember that digital technologies not only can impact teaching and learning but can also enhance various aspects of the **management of apprenticeships across all stages,** and providers and companies should have in place plans and strategies to develop their capabilities to be able to capitalise on them. Examples of tools to enhance apprenticeship management include digital platforms to promote apprenticeships and recruit and match apprentices with companies; learning management tools to create, host and share learning content; digital tools such as digital logbooks to monitor apprentices' performance; and digital communication tools/platforms to enable real-time exchanges between VET providers, apprentices and companies[21].

Good practice example: Digitalising training design and training administration/ management in Austria

As part of the "We Educate the Economy" plan[22], the Austrian Economic Chamber, in collaboration with the Ministry of Economy, is enacting measures to enhance digitalisation in apprenticeships regarding both content and administration[23]. These actions aim to:

- Integrate digitalisation into teaching and training methods to ensure apprenticeships remain current with technological advancements;

- Implement more efficient and resource-saving administrative and management processes within training companies.

Specifically, the measures being introduced include:

- Developing an online tool to support apprenticeship design and documentation;

- Providing training guidelines and resources, including a platform for sharing best practices in digital learning and training, to assist companies in designing their training offers;

- Offer funding opportunities for digitalisation and innovation through the 'Funding apprenticeship' progamme;

- Developing online tools and services to digitalise application and administration processes.

These initiatives include greater emphasis on digitalisation in the content-related modernisation and creation of new apprenticeship occupations, support for in-company training and trainers with digital tools, and the simplification of administrative processes via digital application and examination management.

Finally, a critical aspect of digital infrastructure to consider is the issue of **access and the digital divide**. The shift to learning online during the COVID-19 pandemic highlighted inequalities in access both to appropriate portable devices (mobile phones and laptops) and the internet connectivity required to access learning tools[24]. It also shone a light on the fact that while young people might be regarded as 'digital natives', this does not mean they know how to use digital tools to access courses, undertake them and manage their learning online; seeing young people in this way can, indeed, be a misperception[25] which could lead to inappropriate approaches to teaching practice. At the same time, adult learners or workers who lack proficiency in digital skills may encounter additional obstacles to retain their job or return to a labour market that requires increasingly higher digital competences, thus widening the digital divide between generations. Apprentices from disadvantaged backgrounds are more likely, furthermore, to have poor digital skills.

Spotlight on digital skills for adult apprentices

Introducing digital skills in apprenticeship programmes targeting adult learners can bring benefits at individual, societal, and organisational level. From an individual perspective, having the opportunity to develop digital skills and competences, allows adults to upskill or reskill, boost their employability, and remain attractive in the current labour market. From a societal perspective, enhancing digital skills for adult learners means tackling existing digital divides and intergenerational gaps. Furthermore, boosting adults' digital skills through apprenticeships can strengthen social cohesion, as it may result in greater participation in the labour force, better employment opportunities and higher wages[26]. Lastly, from an organisational perspective, supporting adult apprentices to increase their digital skills can encourage other adult learners to engage in training and boost participation levels.

These are key considerations when increasing the focus on digital skills in apprenticeships, to ensure that apprentices are not disadvantaged if they have poor access to digital services away from a VET provider or training company. While digital infrastructure policies have a key role to play in guaranteeing fair access, VET providers and companies should take into account the specific needs of disadvantaged students, and allow them to borrow suitable digital devices, where possible. For example, in France subsidies of up to a maximum ceiling of EUR 500 per apprentice have been made available to Apprentices Training Centres (CFAs) for the acquisition of equipment (e.g. laptops, tablets, 4G keys), to support distance learning[27]. As well as tackling these 'hardware' inequalities, providers and companies should explore ways in which digital learning software can be used to boost apprentices' general digital skills: digital tools can expand the pedagogical range of apprenticeships into new areas such as game-based learning which can be attractive to apprentices who prefer experiential and embodied learning styles.

Accessing financial support for digital skills

Step 7

Introducing digital skills in apprenticeship programmes can result in VET providers and companies incurring additional costs. The ongoing digital transition, however, has encouraged public institutions at all levels to invest in digitalisation through funding programmes.

For instance, it is worth checking whether **funding opportunities are available at the national, regional or local level**. To this end, Cedefop's database on apprenticeships schemes in the EU and the country briefs available on the Digital Skills & Jobs Platform can be useful resources to learn about funding schemes within EU Member States or incentives available to companies and education providers. Even if specific funding to support digital skills development is not available, there might be broader schemes or incentives that can provide aid for the implementation of apprenticeships as a whole, and that can allow for some financial respite when internal resources are being invested to digitalise processes and equipment.

Spotlight on national funding schemes

Across the EU there are many national initiatives to support digital skills development. These are some examples:

- The Digital Belgium Skills Fund (DBSF) is a funding scheme implemented by the Belgian Federal Public Service Policy and Support (BOSA). Since 2016, the DBSF scheme has been investing in projects designed to boost digital skills, particularly among socially vulnerable young people and (young) adults. In 2023, 22 projects were selected to benefit from a total of EUR 5 million in funding.

- Under the France 2030 investment plan to support the digital transition, the Compétences et Métiers d'Avenir (CMA) (Skills and Jobs of the Future) initiative provides support to train 400 thousand people per year by 2030 and 1 million new graduates by 2030 at the levels of operators, technicians, assistant engineers, engineers, masters, doctorates, and mainly in the field of STEM (Science, technology, engineering and mathematics). Calls for applications are open to startups, SMEs, large industrial groups, higher education institutions, research organisations and schools.

- Skillnet Ireland provides funding for businesses to understand their digital skills needs and support the upskilling of their staff. Businesses can engage with one or more existing Skillnet Networks (e.g., there are four of them providing expertise in the ICT sector, including emerging technologies), which have experience in the chosen sector or region and understand the specific business needs[28].

Aside from financial resources made available within individual countries, many **EU funding programmes** are geared towards supporting companies and education providers to tackle the digital transformation head-on and can provide financial support for integrating digital skills into apprenticeships. Some of the possible EU funding sources include:

- European Social Fund Plus (ESF+): Nearly EUR 43 billion under ESF+ is dedicated to education and skills over the 2021-2027 period, including ensuring training opportunities better match labour market needs[29]. So far, around EUR 2 billion have been programmed exclusively for the support to the development of digital skills. ESF+ is mostly implemented by national or regional institutions, and you can reach out to ESF+ Managing Authorities to find out more.

- Erasmus+: Erasmus+ is the EU's programme to support education, training, youth and sport in Europe. With an estimated budget of over EUR 26 billion, Erasmus+ places a strong focus on social inclusion and the green and digital transitions. For more information about opportunities under Erasmus+, see the Erasmus+ Programme Guide[30] and contact one of the National Erasmus+ Agencies.

- Digital Europe Programme: With a total budget of EUR 580 million for digital skills between 2021-2027, the Digital Europe Programme can provide support to specialised education programmes in key digital areas, including new technologies, provided by networks of higher education institutions, higher VET, research centres and businesses. It also supports short training courses tailored to the needs of companies, and SMEs in particular[31] . The Partner For DIGITAL Skills Networking Group is a helpful platform to find partners for calls under this funding programme.

- Recovery and Resilience Facility (RRF): Upskilling and reskilling is one of the seven priority spending areas of the RRF. In their national plans to implement the RRF, EU Member States are strongly encouraged to focus on investing in skills and digitalisation.

- European Regional Development Fund (ERDF): With a budget of EUR 226 billion, the ERDF aims to strengthen economic, social and territorial cohesion in the EU. Between 2021–2027, the ERDF will enable investments to increase the competitiveness of businesses, including by supporting innovation in the area of digitalisation and connectivity. As such, the ERDF can support companies and organisations to further develop their digital infrastructure. As with ESF+, the ERDF is mostly implemented at the national and regional level and more information on Managing Authorities can be found here.

To find out more about funding opportunities under these EU programmes, you can check this database and search tool made available by the Pact for Skills – a flagship EU initiative supporting public and private organisations to take action for upskilling and reskilling, so they can thrive through the green and digital transitions.

Checklist

Have you taken all the necessary steps to integrate digital skills in your apprenticeship offer? Fill in the checklist below and decide!

	Steps	Yes	No	Comments
A	Using internal assessment / audits to identify digital skills gaps for teachers / trainers	◯	◯	
B	Using self-assessment tools for educators / mentors to identify their digital skills gaps	◯	◯	
C	Organising regular capacity-building opportunities for educators / mentors on digital skills	◯	◯	
D	Building partnerships with ICT training centres to support your upskilling and reskilling activities	◯	◯	
E	Searching and applying for national level funding to finance your upskilling and reskilling activities	◯	◯	
F	Searching and applying for EU level funding to finance your upskilling and reskilling activities	◯	◯	
G	Providing teachers / trainers with information on online learning resources on digital skills	◯	◯	
H	Purchasing equipment, tools, and infrastructure considering emerging technologies and industry needs	◯	◯	
I	Using digital platforms for the promotion of apprenticeships and recruitment and matching of companies and apprentices	◯	◯	
J	Using learning management tools for apprenticeships	◯	◯	
K	Using digital tools and data analytics to monitor apprentices' progress	◯	◯	
L	Using digital technologies to coordinate apprentices, VET providers and companies	◯	◯	

	Steps	Yes	No	Comments
M	Providing digital hardware and software to learners to ensure equal access	◯	◯	
N	Using digital tools to open up new types of learning for apprentices (from disadvantaged backgrounds) with low general digital skill levels	◯	◯	

❝

Securing the right digital infrastructure means enabling teachers, trainers and apprentices to reach their digital skills goals ❞

Stage 3:

Designing And Implementing Programmes

Introduction

Integrating digital skills into apprenticeships involves **making the most of the opportunities afforded by digital learning technologies** to enhance digital skills acquisition. Many apprentices will acquire digital skills by 'learning by doing' on the technologies that companies use in production and service delivery. Alongside this, VET providers and training companies need to understand how digital learning can add value to learning, can help apprentices to build both foundational and more advanced digital skills and can be used to develop new pedagogies.

Several important features are key to understanding the digital learning world:

- There is now a **wide range of digital tools that can be used to develop apprentices' digital skills**. The digital learning environment has been evolving over several decades and comparatively early technologies like laptops, DVDs and interactive white boards are still widely used, accompanied by the growing use of online tools, resources and internet content. However, there are now technologies like 3D printing, various forms of simulated reality (VR/Augmented Reality (AR)/Mixed Reality (MR)/Extended Reality (XR)) and most recently AI which are coming into the workplace and therefore have implications for apprenticeships.

- New technologies provide **opportunities to improve the delivery of apprenticeships** and to make more effective connections between the workplace and classroom elements. Online learning, AI and simulations widen the range of pedagogies possible and can shift the teacher/trainer role to that of facilitator and open up more individualised learning; and they can improve communications between apprentice, classroom teacher and workplace trainer.

- In terms of **new pedagogical opportunities**, as well as the blended learning that has become more prominent since the COVID-19 pandemic, digital learning tools also enable more social and collaborative learning by their ability to connect apprentices, teachers and trainers, whilse game-based apps and simulations can appeal to learners who prefer 'hands-on' to classroom learning.

Steps to Follow

Identifying relevant digital tools and technologies

There are a wide range of digital tools and technologies that apprenticeships can tap into, as outlined below. Analysing sectoral and/or organisational digital skills needs (see step 2), building relevant partnerships (see step 3), and assessing the available digital infrastructure (see step 4) will be useful to then identify what types of digital tools and technologies can be integrated in your apprenticeship offer.

Blended and online learning now benefits from a vast and increasingly wide range of tools. Open education resources (OER) and open courseware (OCW) are free to use and can help apprentices to develop underpinning knowledge about the technologies they are likely to encounter in the workplace including AI, ranging from general knowledge to advanced theories related to specific apprenticeship programmes in IT. Massive Open Online Courses (MOOCs) are perhaps the most well-known form of OER/OCW. The advent and ubiquity of mobile devices (laptops, smartphones) has gone hand-in-hand with the growth of learning apps that provide unprecedented flexibility in where and when apprentices can learn.

Step 8

Good practice example: Providing the off-the-job element of apprenticeships online

In France, Openclassrooms can provide 100 % of the off-the job component of an apprenticeship programme online. The Openclassrooms platform includes video courses and real-life projects that are always accessible plus weekly one-on-one mentorship sessions with a dedicated professional in each field. Subjects covered include BA and MA degrees in web development, data, Information Technology (IT) and project management recognized by L'Académie de Paris[32] .

Simulation technologies such as VR and the various forms of augmented, mixed or extended reality (AR, MR, XR respectively) that mix the real and virtual worlds, are becoming increasingly commonplace in the workplace and in VET. Headsets and 'smart glasses' are transforming how humans interface with work processes and are also changing how teachers/trainers, learners and machines interact. These technologies are reported to be appealing to young learners[33] , especially those who prefer visual or hands-on learning styles. Simulation technologies make it possible for apprentices to learn work practices initially away from the workplace and in a safe way (a key benefit where work tasks may have inherent dangers, e.g. using digital tools in construction) and they can repeat exercises more quickly than in the real world. However, the benefits of using of simulation technologies should be assessed against existing limitations, including costs, potential side effects (e.g. dizziness, VR motion sickness, skin irritation)[34] .

Good practice example: Using VR to develop digital garden design skills

GardenVR58 provides an immersive VR experience that allows apprentices to design a garden in 3D. Apprentices can design a garden in 2D plan format and then walk through it in a 360-degree 3D environment. They can experiment with different ideas, e.g. planting a tree and then observing the consequence, as well as looking at daily, and yearly changes so that they can visualize how their garden evolves with the seasons[35].

AI tools are the most recent digital tools to emerge and have prompted a wave of speculation about their potential benefits and disadvantages in education. AI can gather and analyse data at unprecedented speeds and scales, and the first 'large language models' have raised concerns that learners can use them to subvert assessment processes. But AI is a 'foundational' technology and is already being put to work in simulation technologies. AI has enormous potential to enhance learning analytics to improve the individualisation of apprenticeship pathways and is already being deployed in workplaces, including in virtual workspaces, 'digital twins' etc. It is vital therefore that teachers/trainers and apprentices understand AI so that they can put it to best use to enhance teaching and learning.

It is also important to remember that digital skills can be developed not just through formal use of digital learning tools but also through **informal learning opportunities**. For example, apprentices' use of collaboration platforms such as Microsoft Teams as well as learning-oriented platforms like Moodle (see section on digital infrastructure) to download assignment briefs, upload their work, and receive feedback etc. provides them with an opportunity to develop real-world basic digital skills.

Introducing digital skills in learning agreements

Step 9

Learning agreements are crucial to the successful delivery of any apprenticeship programme and should be developed before the start of the apprenticeship. They should set out the objectives of the apprenticeship period, what is expected of each of the parties (apprentice, VET provider and companies involved), their roles and responsibilities. To ensure the apprenticeship can support learners to develop digital competences, learning agreements should include specific learning outcomes related to digital skills, that the apprentice can work towards during their apprenticeship experience. As outlined in step 1, learning outcomes included in the apprenticeship agreement should be based on requirements under national curricula and qualification frameworks.

When introducing digital competences into apprenticeships, it is also important to **build on the digital skills many apprentices already possess** (though it is important not to assume all apprentices are 'digital natives', as explained in the section on digital infrastructure). This is crucial to make sure that apprenticeships remain interesting and attractive for learners and can help them gain new skills and knowledge.

Good practice examples: Robo CO and Digital Challenge

Robo CO is an ESF+ funded project designed by the City of Riihimäki, Häme University of Applied Sciences, and Hyria Education in Finland aiming to ensure that people have the right skill sets for changing workplaces, particularly by advancing expertise in robotics and AI. Robo CO.'s main objective is to help students strengthen their understanding of technology, particularly robotics and AI, to cultivate literacy in these fields, and to teach them how to discern facts from misinformation. Underpinning the project is a strong cooperation with industry players, which can provide hands-on experience and bridge the gap between theoretical knowledge and practical application, allowing students to connect with the world of work.

Digital Challenge is an ESF funded project by IMS Luxembourg and CARE, which aims to encourage collaboration and cooperation between young people and companies, to understand the skills needed for the current and future labour market, including those relating to digitalisation and sustainable development. The project gives students the chance to engage with companies through events and workshops and hear from them about the real-world challenges they face to explore solutions together.

To facilitate this process, it could be helpful to **assess apprentices' digital skills** at the beginning of the apprenticeship journey, to further tailor learning agreements and pathways to the individual needs of each learner. Initial assessments should be accompanied by efforts to regularly monitor progress, so that learning pathways can be adjusted and remain relevant to both the needs of apprentices and employers. As outlined above (see step 4), there are many examples of existing self-assessment tools that can be of inspiration to VET providers and companies to measure apprentices' digital skills levels at the start and throughout the apprenticeship.

Good practice examples: Europass Digital Skills Assessment Tool, OECD Education & Skills Online assessment, IT Fitness Test

The Europass Digital Skills Self-Assessment Tool (Dig SAT) allows users to test their digital skills and understand strengths and areas for improvement. The tool also suggests personalised learning plans and a proposed roadmap to improve their skills, depending on the digital skills profile that emerges from the results of the test, and the profession or sector users would like to access.

The OECD – Education & Skills Online Assessment is an assessment tool designed by the OECD to provide individual-level measures of literacy, numeracy and problem-solving in technology-rich environments. The assessment tool has been developed for youth and adults of all ages and can be used by organisations to assess the skills of individuals (e.g. apprentices) to provide training or for research purposes. The test is available in 10 languages (Czech, English, Estonian, French, Italian, Japanese, Russian, Slovak, Slovenian, Spanish).

The IT Fitness Test was developed as a comprehensive tool to test the digital skills of primary and secondary school students and teachers in Central Europe. The tool aims to validate and measure practical skills and competences in the following areas: internet, security and computer systems, complex tasks, office tools, social media and collaborative tools. To date, IT Fitness Test has been used by over 550,000 students and has been endorsed by both public authorities and ICT stakeholders.

Lastly, it is also important to keep in mind that not all apprentices are the same. Both employers and VET providers should take into account each apprentice's socio-economic background, and different digital skills levels, to ensure that apprenticeship offers are tailored to their needs and that apprentices are provided with the support necessary for them to thrive, thus promoting inclusivity and accessibility.

Good practice example: An online pre-apprenticeship programme for the IT sector in Ireland

In Ireland, a 100 % online pre-apprenticeship programme has been developed as a route into apprenticeships in the IT sector, and has been designed for young people and adults who are unsure which IT profession might be of interest to them or who may not currently satisfy apprenticeship eligibility criteria. Positioned at Level 5 on the Irish National Framework of Qualifications (NFQ)[36] (EQF Level 4 equivalent), the programme provides a taster of IT roles in Software Development, Computer Networking and Cybersecurity, and successful completion of the programme gives access to apprenticeships in these three areas at Level 6 (EQF Level 5 equivalent).

Following successful piloting during the COVID-19 pandemic, the programme is now an established part of the IT apprenticeship landscape. With a maximum of 20 people in each class, learners access the nine-month full-time course remotely, working with tutors who are based across the country and place the emphasis on self-directed learning. The programme was developed by Fastrack into Information Technology, an industry sector body with a central role in developing Ireland's technology talent pipeline, and which is the national Coordinating Provider of a growing set of technical apprenticeship programmes.

Designing learning activities

After identifying relevant tools and technologies that can be integrated into apprenticeship programmes, the next step is to design concrete activities through which apprentices will learn and apply their basic digital skills, in line with requirements under national curricula and qualification frameworks. To this end, resources are available on several platforms to help trainers and mentors shape their teaching. For example, the Digital Skills & Jobs platform provides useful examples of teaching units on digital skills and emerging technologies from all around Europe and beyond, including exercises, tutorials, lectures and video-lessons.

Good practice examples: Erasmus+ project supporting digital skills in VET and apprenticeships

The Digital Apprentices Mobility in the Automotive Sector (DAMAS) initiative is an Erasmus+ project aimed to tackle challenges to implementing apprenticeships in the automotive sector during the COVID-19 pandemic, by making use of digital technologies. The project primarily targeted VET providers, teachers and trainers and aimed to:

• Build a digital learning platform to improve VET teaching;

• Develop guidelines on implementing VET teaching;

• Present innovative technologies and digital applications (e.g. VR) to enhance virtual mobility.

VACIDE – vocational action competence in digital environments is an Erasmus+ project aiming to introduce digital skills in VET and apprenticeships in the manufacturing sectors by both developing tools and learning pathways, and training apprentices and educators.

DigComp 2.2, moreover, offers helpful learning scenarios. Other helpful information on how to concretely implement the framework can be found in the user guide DigComp into action, get inspired make it happen and in the DigComp at work publication, which offer examples of inspiring practices from stakeholders working on the ground.

Good practice example: DigiGo – Apprenticeships in the digital era

The Erasmus+ project DigiGo - Apprenticeships in the digital era is a practical tool that guides mentors and trainers when teaching digital skills. When designing concrete activities, the project identifies the following elements to be defined:

• **Title of the activity**

• **Problem:** a digital task that should be carried out by apprentices. It can be presented as a question or outcome – e.g., 'how can we organise an internal video conference?'.

- **Targeted DigComp 2.2 competence area:** referring to one of five areas covered by the framework (i.e. information and data literacy; communication and collaboration; digital content creation; safety; and problem solving).

- **Digital skills targeted:** best defined as a verb, e.g. 'To resolve technical problems with the most appropriate solution'.

- **Description (step by step):** including the objectives and interest of each step and concrete examples.

- **Location/conditions of implementation:** activity to be done in the company or at home.

- **Collective activity or individual:** whether the task is to be completed in a group or by students/apprentices alone.

- **Material requirements:** list the material requested (ideally provided by companies / VET providers).

- **Duration of the activity:** frequency such as one hour per week until the end of apprenticeships.

- **Skills assessment:** how the digital competence targeted by the activity is going to be assessed.

- **Additional resources:** resources that can help apprentices to conduct this activity.

- **Observation:** trainers' / apprentices' feedback upon completion.

Step 11

Capturing and recognising apprentices' digital skills achievements

It is key to ensure the achievement of digital skills and objectives, as defined in the learning agreement, is recognised by carrying out adequate assessments at the end of the apprenticeships. To further ensure that apprentices can demonstrate the digital skills they have developed, employers could provide a **completion certificate or letter, outlining the main tasks undertaken and the digital competences acquired by the apprentice**. This can motivate them to fully engage in the learning process, while also allowing them to easily demonstrate their skills to other potential employers. Apprentices should also be given **recommendation/reference letters** describing progress that they have made. These letters might be very useful for their future employers, as it will provide them with a first-hand account of their (digital) skills, personality and work ethics.

Furthermore, VET providers and companies can support apprentices to set up their own Europass profile & CV, and include a section on their apprenticeship and digital skills developed. The Europass Digital Skills Self-Assessment Tool (Dig SAT) can also be a useful tool, as it not only allows users to undertake a self-test, but also provides them with a 'report' outlining the results of the test, which can be downloaded and included in their Europass profile and CV.

Spotlight on digital assessment tools and badges

Digital assessment tools are becoming increasingly common in apprenticeships, often being an integral part of learning tools. They can be helpful as part of formative assessment processes, being able to provide detailed real-time feedback to teachers and apprentices. They also create new possibilities as part of summative assessments, enabling apprentices to use video and audio recordings and to compile ePortfolios to present their achievements. Digital assessment can thereby enable apprentices to use new sources to evidence their achievements and open up opportunities for more personalised assessment. Digital badges (micro-credentials) are also increasingly common as a means of recording achievements in online learning.

VET providers and companies can also ensure that the digital skills acquired by apprentices are recognised by issuing a European Digital Credential for Learning. These are standardised certificates that describe the skills and knowledge acquired by apprentices (e.g. through classes, projects, specific activities) and can be helpful tools to ensure that competences are certified and documented. The Europass website provides thorough guidance to organisations wishing to issue a Digital Credential.

Checklist

Are you ready to integrate digital skills in your apprenticeship offer? Fill in the checklist below and decide!

	Steps	Yes	No	Comments
A	Deciding what type of digital earning and assessment tools to use, including the new generation of simulation technologies (VR/AR/MR/XR)	◯	◯	
B	Training companies using digital learning tools alongside teaching apprentices how to use the digital equipment in use in the workplace	◯	◯	
C	Using digital learning to support the development of innovative pedagogies (e.g. collaborative learning, game-based learning)	◯	◯	
D	Designing concrete activities (e.g. teaching units, assignments and exercises) for apprentices to develop and practice their basic / advanced digital skills	◯	◯	
E	Designing learning activities for digital skills that are inclusive and accessible to all apprentices	◯	◯	
F	Including learning objectives on digital skills as part of apprenticeship agreements	◯	◯	
G	Assessing apprentices' digital skills at the start / during / at the end of the apprenticeship	◯	◯	
H	Organising assessments and validation of apprentices' digital skills based on learning agreements	◯	◯	
I	Providing the apprentice with a completion certificate or letter outlining digital skills developed	◯	◯	
J	Providing the apprentice with recommendation or reference letters	◯	◯	
K	Supporting apprentices to use available tools to showcase their digital skills (e.g. Europass)	◯	◯	

"

Including digital skills development in learning agreements allows apprentices to work towards achieving specific learning outcomes. "

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15. Please note that CoVEs are networks of partners that develop local "skills ecosystems" to provide high quality vocational skills to young people and adults, and contribute to regional development, innovation, industrial clusters, smart specialisation strategies and social inclusion. Moe information can be found here.

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