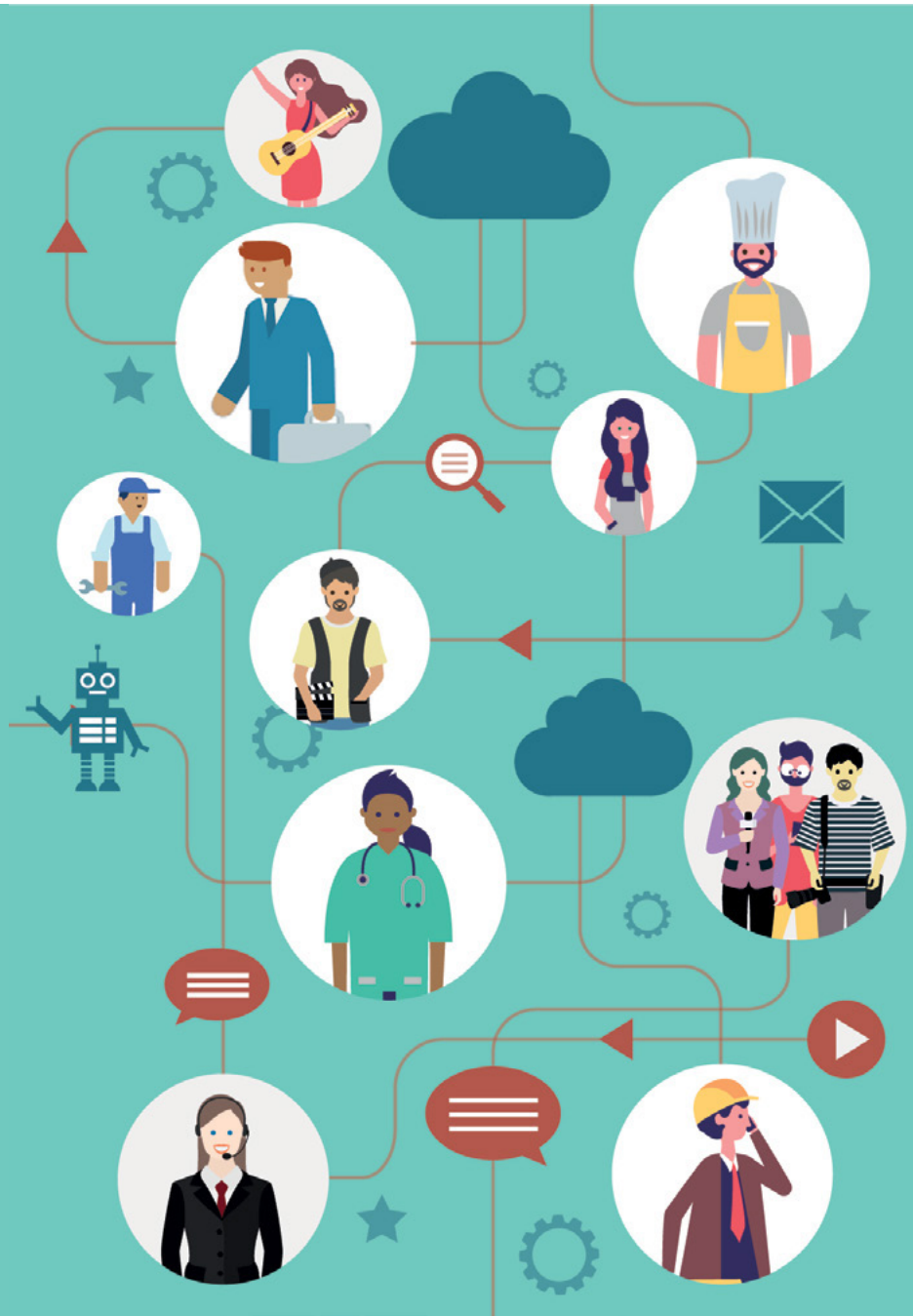
European Commission



DigComp at Work

Implementation Guide

Joint Research Centre

EUR 30204 EN

Contact information
Name: Clara Centeno
Email: clara.centeno@ec.europa.eu

EU Science Hub
https://ec.europa.eu/jrc
JRC120645
EUR 30204 EN

PDF
ISBN 978-92-76-18581-9
ISSN 1831-9424
doi:10.2760/936769

Luxembourg: Publications Office of the European Union, 2020

How to cite this report: Centeno, C., DigComp at Work Implementation Guide, Okeeffe, W. editor(s), EUR 30204 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-18581-9, doi:10.2760/936769, JRC120645.

Design and layout: Valentina Barsotti / Takk studio

DigComp at Work Implementation Guide - This Implementation Guide accompanies the "DigComp at Work" report published separately. It aims at supporting labour market intermediaries in their digital skilling actions in employability or employment contexts. It offers specific guidelines, examples, tips and useful resources for the use of DigComp for defining specific job's digital competence needs, for assessing digital competences and for cataloguing, developing and delivering training on digital competences.

Clara Centeno

DigComp at Work

Implementation Guide

Editor: William O'Keeffe

Joint Research Centre

TABLE OF CONTENTS

WELCOME MESSAGE

These two reports, *DigComp at Work: The EU's digital competence framework in action on the labour market*, and its *Implementation Guide* with practical guidance for labour market intermediaries on the use of DigComp are a new chapter in the success story of DigComp.

DigComp was first published in 2013 and since then has been used in national and international policy-making and in the design and delivery of digital skills development across the EU.

The story of DigComp is a story of commitment by stakeholders. DigComp stakeholders have translated, adapted, interpreted and applied DigComp in a variety of inspiring ways. DigComp stakeholders have also become ambassadors for co-operation on digital skills in Europe through working together in innovative projects and communities of practice.

These reports highlight the important use of DigComp by labour market stakeholders. It is a given now that digital skills are essential for life and work and are the foundation for employability and accessing information and support throughout our careers.

Support for managing the digitals transitions are at the heart of the European Skills Agenda adopted by the European Commission on the 1st of July 2020. DigComp has and will play a role in supporting the work of countries, companies and social partners to support the development of digital competences. The case studies showcase practical examples of the development of the digital competences, and the Implementation guide offers specific guidelines, examples and useful resources for the use of DigComp.

Our hope is that they serve as a call to action for greater uptake of DigComp and delivering on the goals of the European Skills Agenda.

I wish to give special thanks to those organisations: The Associazione Emiliano Romagnola di Centri Autonomi di Formazione Professionale and Ervet (Italy), Anpal Servizi (Italy), Ikanos project, Basque Government and Ibermática (Spain), ECCC Foundation (Poland), Expertise France (France) and Lai-momo (Italy), Hellenic Open University – DAISSy research group (Greece), Smartive (Italy), Tecnalia (Spain), Adecco, Mylia and Advancing Humanity srl (Italy), that gave such rich and inspiring information on their case studies. Thanks also to the team in the Commission's Joint Research Centre for their work in creating this report as well as their ongoing work on the implementation and development of DigComp.

Alison Crabb

Head of Unit, Skills and Qualifications
DG Employment, Social Affairs and Inclusion
European Commission

1. INTRODUCTION

Background

This guide has been developed to support actors with digital skilling functions they provide in employability or employment contexts[1] to respond to the digital transformation in the labour market.

Labour market intermediaries (LMI) provide a wide set of skilling related services which aim to develop the digital competences of employees or people looking for a job, including: collection and dissemination of labour market information; outreach and individual support; career guidance; support for adult learning; fostering transparency of skills and qualifications; job experience and placement; job search assistance and matching; and monitoring and after care.

In providing these functions, DigComp, the European Digital Competence Framework, provides support to LMIs due to its distinctive features. Its consensus-based origin and EU endorsement provides it with credibility and reliability. DigComp brings a new view of what digital competence is, and its clear and solid structure, completeness, flexibility and neutrality, have been key enabling and success implementation factors.

This Guide offers specific guidelines and tips on the use of DigComp for the implementation of digital skilling services.

The Guide has been developed based on the knowledge gathered through the case analysis described in the DigComp at Work report, and complemented with previous knowledge compiled and described in the Guidelines on the adoption of DigComp (Kluzer, 2015) and the DigComp into Action guide (Kluzer S. and Pujol Priego L., 2018).

1 See "Developing digital competence for employability: Engaging and supporting stakeholders with the use of DigComp : stakeholders ´ consultation workshop Bilbao, June 19-20, 2019", http://dx.doi.org/10.2760/625745

Purpose

The aim of this Implementation Guide is to complement the knowledge gathered at the DigComp at Work report which contained a thorough analysis of 9 cases of use of DigComp in employment or employability contexts. It offers recommendations on practical steps, key actions, tips and on-line resources for the implementation of DigComp in these contexts. The Implementation Guide is to be read together with the DigComp at Work report.

As a first edition, it is necessarily incomplete. Stakeholders may wish to keep this Guide alive with contributions based on their own experiences. If such an enriching process shows to be of value for stakeholders, we will explore how this process could be managed.

Who is this Guide addressed to?

This Implementation Guide is addressed to a wide range of Labour market intermediary (LMI) actors who are involved in digital skilling functions for job-seekers or workers that need re-skilling or up-skilling of their digital competences, to be able to respond to changes in the labour market.

T.1 aims at classifying LMI types and subtypes according to the people they serve: students in initial education, non-employed and employed people, and those LMIs working across all types of individuals.[2]

Use of DigComp for which skilling functions?

The research[3] has shown that stakeholders or LMIs make use of DigComp for a large set of skilling-related functions, as illustrated in **T.2** (source: DigComp at Work report **T.5**).

2 As shows the research carried out by Visionary Analytics, under contract number 936043-2018 A08-LT (Lot 1) "Mapping DigComp and EntreComp Use Lot 1: Analysis of Labour Market Intermediaries active in digital and entrepreneurial skilling services"

3 Carried out by The Woman Organisation, Bantani Education and Stefano Kluzer, under the contract number 936054-2018 A08-GB "Mapping DigComp and EntreComp Use Lot 2: Cases Analysis of DigComp and EntreComp Use".

T.1 DESCRIPTION OF LMI TYPES AND SUB-TYPES		
Type 1. LMIs working primarily with students in initial education	1.1	Formal educational institutions that deliver formal (to some point compulsory) schooling. They include: Primary and secondary schools (corresponding to ISCED levels 1-3;), as well as vocational education and training (VET) schools (ISCED levels 3-5 with vocational orientation) and higher education institutions (HEIs; ISCED levels 5-8);
	1.2	Non-formal education providers that offer extracurricular activities that complement the programmes of educational institutions (e.g. an after-school language course);
	1.3	Informal education providers that facilitate students' self-learning in the areas of their interest with no imposed course structure, external requirements, and assessment (e.g. a school chess club).
Type 2. LMIs primarily working with the non-employed	2.1	Public Employment Services, i.e. a public body, either a part of ministry of labour or, less often, a separate executive agency, that provide comprehensive support to the unemployed, and have legal obligations towards them;
	2.2	LMIs addressing critical barriers to employment – typically NGOs or social businesses that target specific vulnerable groups that need more intensive or specific professional support.
Type 3. LMIs primarily working with the employed	3.1	Trade unions, i.e. collective associations of employees;
	3.2	Employers and employer associations - collective associations of employers.
Type 4. LMIs working across all the target groups	4.2	Upskilling providers that provide adult training. These include formal, non-formal and informal professional and adult education providers. They consist of: Face-to-face and online training providers, as well as MOOC (Massive Open Online Course) platforms, that congregate distance learning courses offered by different HEIs.
	4.3	Job experience providers that enable allocation of individuals in a real work environment. They include: Providers of work-based learning (WBL, including internships, traineeships, apprenticeships, job-shadowing, etc.), volunteer opportunities; public works programmes and social enterprises and cooperatives.
	4.4	Job brokers that facilitate matching job seekers with vacancies. They include: job websites (platforms used to exchange information about vacancies and jobseekers' profiles), short-term employment facilitators (organisations that assist individuals / employers in finding temporary work / worker), and private recruitment agencies (that help employers fill their medium- and high-level vacancies).

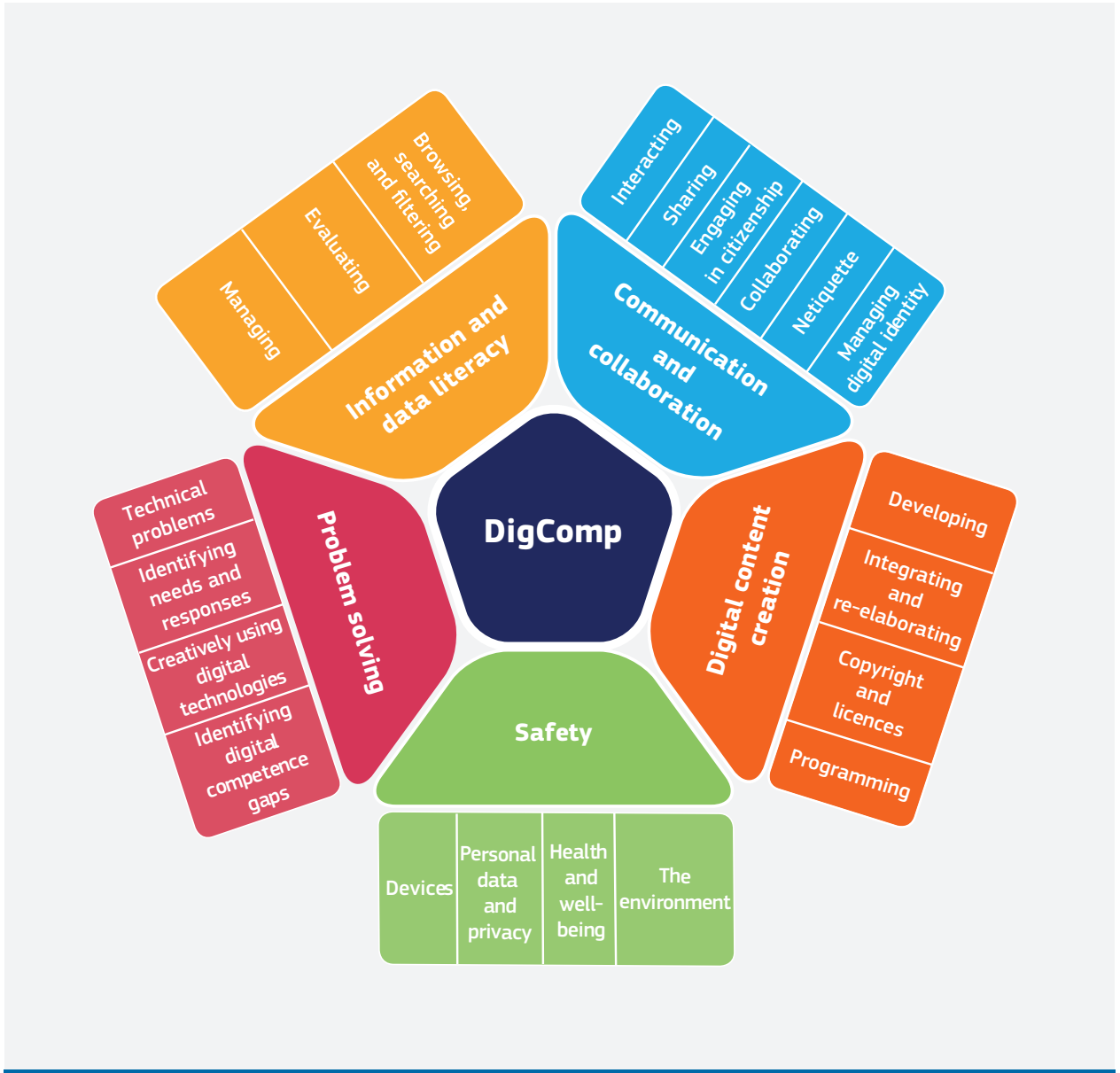
T.2 USE OF DIGCOMP PER LMI FUNCTION												
LMI FUNCTION	DIGCOMP USE	CASES (LMIS WORKING WITH: STUDENTS IN INITIAL EDUCATION, EMPLOYED, NON-EMPLOYED, ALL TARGET GROUPS)										
		C1 A PEI	C1 B DCDS	C2 PRODIGEO	C3 IKANOS	C4 ECCC	C5 COMPASS	C6 MU.SA	C7 SMARTIVE	C8 A BAIT	C8 B P4E	C9 ADECCO
Labour market skills analysis	Analysis of digital competence requirements in various occupations			✓		✓				✓	✓	
	Design of professional digital profiles				✓		✓	✓	✓		✓	
	Benchmarking services in business sectors aiming at identifying skill requirements at organisational level and at comparing your skill level with organisation´s competitors				✓				✓			
Career advice	DigComp used for career advice/guidance				✓							
	Link self-assessment and training offer to specific careers						✓				✓	
Personal development plan	DigComp used for further training and/or career advice/guidance				✓							
	Link self-assessment and training offer to specific occupational profiles						✓				✓	
Design and delivery of training	DigComp use for training offers	✓	✓	✓	✓	✓	✓	✓		✓		
Workforce development	DigComp-based skills assessments											
Assessment of skills	Design of DigComp-based (self-)assessment tools		✓		✓		✓		✓		✓	✓
Certification of competence	Certification of DigComp competence or Certification of course completion	✓		✓		✓	✓	✓		✓	✓	

About DigComp

DigComp was first published in 2013 as a reference framework to support the development of digital competence of individuals in Europe. It describes which competences are needed today to use digital technologies in a confident, critical, collaborative and creative way to achieve goals related to work, learning, leisure, inclusion and participation in our digital society.[4]

The DigComp Framework has 5 dimensions:

1. Competence areas (5) identified to be part of digital competence (see **F.1**);
2. Competence descriptors and titles (21) that are pertinent to each area (see **F.1**);
3. Proficiency levels for each competence;
4. Knowledge, skills and attitudes applicable to each competence, and
5. Examples of use, on the applicability of the competence to different purposes.



F.1 DIGCOMP COMPETENCE AREAS AND COMPETENCES

4 Based on the definition of Digital competence described in the Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC)

How to use this Guide

A.

If you are unfamiliar with DigComp,

please first read Chapter 1: Introducing DigComp of the DigComp into Action guide for a detailed presentation of the framework, its related dimensions and the reference documentation.

B.

Get acquainted

with the content of DigComp at Work report, in particular its Chapter 2: Mapping DigComp use in the labour market.

C.

You are now ready to use this Guide, which is structured in two key parts:

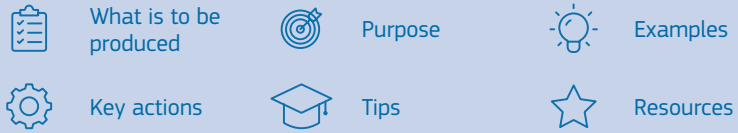
General Guidelines for the use of DigComp, which needs to be read by all LMIs planning to provide any of the above referred skilling functions. These General Guidelines are organised as follows:

G1. Getting started with your DigComp based project
G2. During your DigComp based project
G3. After your DigComp based project finishes
G4. Additional strategic considerations

Specific Guidelines for the use of DigComp for specific but interrelated skilling functions. Readers can choose the section of their interest:

S1. Defining competence needs: defining the digital competences needed for a specific professional profile or sector
S2. Assessing competences: assessing and/or certifying the digital competences of a job seeker or employee, or of an organisation, or of a part of it
S3. Training: cataloguing, designing, developing and delivering training on digital competences

The Specific Guidelines are organised as follows:



2. GENERAL GUIDELINES FOR DIGCOMP BASED IMPLEMENTATION

G1 Getting started with your DigComp based project

1. Using DigComp in your language
2. Internalise DigComp´s view of digital competence
3. Learn from others
4. Re-use existing resources

P.12

G2 During your DigComp based project

1. Invite all relevant stakeholders
2. Identify the suitable stakeholders' strategic cooperation model
3. Adopt the DigComp naming convention
4. Adapt DigComp to your needs and context
5. Consider implementing monitoring tools

P.13

G3 After your DigComp based project finishes

1. Share your own resources and lessons learnt
2. Continue learning from each other
3. Revisit your outputs

P.13

G4 Additional strategic considerations

1. DigComp needs clear communication

P.14

2. Communicate "compliance" with DigComp of learning resources and programmes

P.14

3. Adopting DigComp's holistic view of digital competence in learning and teaching methods

P.15

4. Developing new learning resources and methods in line with DigComp and Training Teachers

P.15

5. Certification

P.15

G1 Getting started with your DigComp based project

1. **Using DigComp in your language** is an important starting point.

- Look for a translated version of DigComp in your language(s)
- If no translation is available, it is best to prepare your own translation (involve both a linguistic and a specialist on digital competence)
- In line with the open copyright licence which allows re-use of DigComp material and its translation following certain guidelines, you can consult the following resources:
  - Recommendations and Template for translating DigComp 2.1
  - General rules to translate the DigComp reports
  - Linked OpenData interface for DigComp 2.0
  - Language versions of DigComp.

2. **Internalise DigComp´s view of digital competence.** The distinguishing feature of DigComp's view of digital competence is to look beyond the technical ability needed to use specific digital tools and services to include a broader view as well as critical and reflexive capabilities. This is crucial to grasp fully the opportunities and risks of today's digital world. For instance, knowing how to use a search engine is important. However, from a DigComp perspective, it is even more important to know why search results are listed in a certain way and how they might reflects users' preferences as a possible result of profiling practices by search services suppliers.

3. **Learn from others.** Identify if there exist any projects with similar aims as yours, in your own country or abroad, and contact the project leader / owner to learn from their experience. For that purpose:
   - Join the DigComp Community of Practice (CoP) hosted by All Digital
   - Consult the DigComp into Action guide
   - Consult the DigComp at Work report.

4. **Re-use existing resources.** Identify if there are on-line accessible resources similar to the ones you want to produce so as to share knowledge and resources, systems, etc. Consider translating and re-using existing material, software, etc. For that:
   - Ask for help in the DigComp Community of Practice (CoP) hosted by All Digital
   - Consult the DigComp into Action guide
   - Consult the DigComp at Work report.

G2 During your DigComp based project

1. **Ensure all relevant stakeholders are invited to your project.** Consider inclusion of employers, trade unions, employment services, training providers and other actors. Use the LMI types (Table **T.1**) to scan for possible actors.
2. **Identify the suitable stakeholders' strategic cooperation model** for the project. Any activity to develop digital skills and to implement DigComp can require the participation of a wide-range of diverse stakeholders. Consider options such as project or institutional based collaboration, continuous dialogue, or community of practice, as possible co-operation models. In any case, ensure shared ownership, trust and flexibility for a successful partnership-based approach.
3. **Adopt the DigComp naming convention** to facilitate communication: Once you have your version of DigComp, share it among the different stakeholders that will participate in your project. Some training sessions could be necessary to become familiar with DigComp, its 5 dimensions and 21 competences. Especially with different stakeholders involved, some learning is required to understand how to fully and effectively use the framework.
4. **Adapt DigComp to your needs and context.** One of the key features of DigComp is that it can be tailored to your context. You can use DigComp to identify relevant competences and levels of proficiency, and to design meaningful learning outcomes for your purpose and context.
5. **Consider implementing monitoring tools** on the outputs of your activities, such as number of training courses provided, number of people that followed and completed the courses, number of assessment tests performed or certificates issued. In addition, follow-up processes to measure impacts of the skilling actions on users' increased employability might also be relevant, for accountability, managerial, social or communication purposes.

G3 After your DigComp based project finishes

1. **Share your own resources** and lessons learnt from your experiences with the DigComp Community of Practice (CoP) hosted by All Digital
2. **Continue learning from each other.**
3. In fact, your DigComp based project never finishes! **Revisit your outputs** (professional digital profiles, tests and training courses) periodically to incorporate the constant evolution of digital technologies and any social and labour changes following technology adoption that might impact on the competences needed.

G4 Additional strategic considerations[5]

1. DigComp needs clear communication

- DigComp describes the *knowledge, skills and attitudes that are needed today to use digital technologies in a confident, critical, collaborative and creative way to achieve goals related to work, learning, leisure, inclusion and participation in our digital society*. It also states that digital competence today entails more than the ability to use given tools and must develop beyond operational functions offered by the tools. These notions may look at first sight obvious to everyone, but they are not.
- This holistic approach to digital competences is rarely considered in ICT skills training offers or considered by employers when recruiting new staff.
- It is important to promote and explain DigComp's vision to teachers, trainers and e-facilitators, but also to employers, who play a key role in driving the demand for digital competences.
- DigComp should also be promoted among policy-makers and other stakeholders who rule over digital competence development, and of course to the very learners involved in it. For this, it is recommended to produce, illustrate and disseminate effective communication materials about DigComp, starting from simple ones with clear examples and explanations about its novelty and why its view of digital competence is important in today's world.
- For that purpose, the following DigComp infographics and flyers support material is available.

2. Communicate "compliance" of learning resources and programmes with DigComp

- DigComp was born out of the study of many ongoing initiatives for the development of digital skills in Europe to encourage their evolution. At the same time, DigComp aims to help citizens understand what digital competence can mean today for them, by providing an articulated and well-structured framework. It is therefore important that when learning resources are developed, used or adapted using DigComp then the alignment to DigComp should be clearly highlighted. Courses, individual lessons, learning materials, self-assessment tests and so on, should be clearly "tagged" according to the DigComp framework and to its specification in each context.

5 The whole content of this section and some sections in the Training section are drawn from Guidelines on the adoption of DigComp (Kluzer, 2015) available here

G4 Additional strategic considerations (continued)

3. Adopting DigComp's holistic view of digital competence in learning and teaching methods

- Learning to use specific tools, devices or applications is usually an inevitable part of the development of digital competence and, teachers and learners tend to focus on this. However, DigComp competences are generic competences that need to be learned regardless of the specific ICT application. For example, for the competence "searching for information", one can learn it using Google search, but it's also important to understand that there are also other ways of finding information, e.g. via Facebook, twitter, newspapers, alternative search engines, etc...
- DigComp competences are usually transversal to and/or independent of specific technology and they need to be fully acknowledged and dealt with in appropriate ways. This concerns both learning content and teaching methods. For instance, practical guidance (e.g. through step-by-step instructions) should be enriched whenever possible with contextual and critical reflections and with exercises producing supportive and clarifying evidence for these reflections. DigComp advocates that the learning approach itself should promote critical thinking, creativity, autonomy, confidence and safety of the learners. This promotion can be done across any delivery mode (face-to-face, distance learning, etc.).

4. Developing new learning resources and methods in line with DigComp and Training Teachers

- Convincing educators to adopt the DigComp perspective is not enough. While there are abundant learning materials and teaching methods available for the traditional approach to ICT skills development, fewer learning materials and methods are readily available to support educators and learners address the critical and reflexive components of DigComp. Any use of DigComp must envisage and allocate resources for the development of effective and sustainable learning materials and teaching methods.
- Refreshment initiatives and introductory training, continuous support and supervision efforts, and the encouragement of peer collaboration are all likely to be necessary. Measures are also needed to support educators face this new challenge/opportunity and to overcome the resistance to change that might occur.

5. Certification

- It is important to consider certification, whether adapting existing systems or establishing news ones, with the DigComp in mind. Still uncommon, this formal recognition could contribute to the qualification of digital competence training, thus helping to create much needed bridges between the world of education and the business sector. Certification would also give a clear signal to both learners and educators alike that digital competence in DigComp's perspective can also be accurately assessed and is an important achievement for fuller participation in our society.

2. SPECIFIC GUIDELINES FOR DIGCOMP IMPLEMENTATION

The Specific Guidelines are structured along 3 major activities:

S1 **Defining competence needs**

Defining the digital competences needed for a specific professional profile or sector.

P.17

S2 **Assessing competences**

Assessing and/or certifying the digital competences of a job seeker or employee, of an organisation, or of a part of it.

P.20

S3 **Training**

Cataloguing, designing, developing and delivering training on digital competences.

P.28

Although these three activities can be carried out in isolation, they are often interlinked. **T.3** shows a possible logical connection between them inspired by the Ikanos project (Case **C3** in DigComp at Work report).

T.3 EXAMPLE OF ACTIVITIES PROVIDED BY STAKEHOLDERS (AUTHOR' S ADAPTION OF IKANOS ACTIVITIES)

	ACTIVITIES TARGETED TO		PEOPLE	EMPLOYERS	BEYOND (OTHER ACTORS)	GUIDELINES
STRATEGY	Discover	Learning about DigComp	✓	✓	✓	G4
	Audit	Self-assessment test	✓			S2
		Personal digital profile report	✓			S2
	Analyze	Digital organisational profile		✓		S2
		Professional Digital Profile		✓		S1
		Definition of training objectives	✓	✓	✓	S3
		Assessment Results Analysis Tool		✓		S2 S3
		Organisational Diagnosis Report		✓	✓	S2
ACTION	Guide	Training Orientation Guide		✓	✓	S3
		Resource Cataloguing	✓	✓	✓	S3
	Learn	PLE configuration	✓	✓	✓	
		e-Portfolio construction	✓			
	Evidence	Digital skills Certification	✓			S2

S1 Defining competence needs: defining the digital competences needed for a specific occupation category or sector

What is to be produced

A definition of the digital competences needed for a specific occupation category or sector. This definition should specify the digital knowledge, skills and attitudes that a professional must possess to adequately perform the tasks that require the use of digital tools and applications in a given job or occupation category.

DigComp provides a reference tool to guide stakeholders (HR departments, managers, etc) to walk through all aspects of digital competence (across the 5 competence areas and 21 competences) to identify and describe current and possible future digital competence needed for a specific job. It is not be noted that DigComp suggests a set of 5 areas and 21 competences to be acquired to become fully digitally competent. However, a subset of these may be sufficient for a specific job profile.

DigComp can be used to develop a **Professional Digital competence Profile (PDP)** for specific jobs. The PDP will list the set of digital competences and soft skills needed and their proficiency levels required for the job. The PDP can be accompanied with a set of relevant learning outcomes, which would be useful to design a related training.

PDPs can be developed for a variety of jobs and job categories including:

- **broadly defined existing occupations** (e.g. administrative worker in the public administration, general office clerk, primary school and early childhood teacher, etc.)
- **generic business functions** (Operations and industrial services, Marketing & Sales, etc.)
- **generic work conditions** (entrepreneur, virtual office worker, consultant for the Third Sector, employment services staff)
- **new IT-intensive jobs** in different economic sectors distinct from IT specialist job profiles (Industry 4.0 jobs in manufacturing, new digital jobs in museums).

Purpose

PDPs can:

- be the reference for the design and administration of (self-)**assessment** or certification tests (see the S2. Assessing Competences Section for more details)
- be used to assess the potential and **suitability of an individual for a job**
- constitute the basis for the design, development and delivery of a specific **training** course focused on the specific job profile
- be used to **evaluate work performance**.

Examples

DigComp into Action guide and DigComp at Work report include a number of **cases** that have developed PDPs for some occupations (some of which available online).

In the DigComp into Action guide:

- **C2** IKANOS for the Basque 4.0 Industry
- **C15** PANE E INTERNET for Digital facilitators (public library staff and volunteers)
- **C20** CODEMOB for Youth e-facilitators.
- **C30** DIGITAL COMPETENCE FOR YOUTH WORKERS.

In the DigComp at Work report:

- **C3** IKANOS for Administrative staff in public organisations, Industrial machine operator, Sales representative, Entrepreneur, Mechatronics/robotics technician, Industrial machinery operator and CNC prog., Advanced manufacturing maintenance technician, 3D designer for additive manufacturing, Additive manufacturing machinery operator, SME digital transformation manager, Consultant on services / programs for Third sector, Economist – Business Manager, Economist – Consultant, Economist – Specialist in digital marketing.
- **C5** COMPASS for Vocational education teachers; Primary school teachers; Finance professionals; Sales, marketing and PR professions; General office clerks; Secretaries; Authors, journalist and linguists; and for Creative and performing artists.
- **C6** MU.SA Emerging Job Roles for Museum professionals includes the four new job roles (Digital Strategy Manager, Digital Collections Curator, Digital Interactive Experience Developed, Online Community Manager) and the digital and transversal competences that characterize each role.
- **C8** PATHWAYS4EMPLOY for the Virtual Office Worker and the (self-) Entrepreneur

Key Actions

- Check if an existing PDP has already been designed in another country or region (see Examples and Resources Sections).
- Identify knowledgeable actors from employer(s) organisations and other entities that will contribute to the definition of the (digital) job profile. Recommended stakeholders include business experts, human resource managers and other managers, and a digital competence expert.
- Use DigComp to develop a common understanding and language of what means digital competence.
- Identify which of the 21 DigComp competences are required for the specific job, at which level, and which learning outcomes are relevant.
- Identify if complementary digital competences (not specified in DigComp) are needed for the job. For specialised IT competences we recommend the use of e-Competence Framework (e-CF).
- Identify which soft skills (communication, collaboration, team working, creativity, etc) are needed for the job, and how the development of digital competences can support the development of these.

Tips

To define a PDP, the following approach can be followed:

- **Step 1.** Experts first describe all the main activities performed in the selected job, reflecting different levels of experience and proficiency and identifying critical tasks from the point of view of work output.
- **Step 2.** Experts identify those activities that can be performed using digital tools (at a later stage hardware and software options are also specified). These digital activities are then mapped to DigComp competences and proficiency levels. Not all DigComp competences are necessarily used in every profile, because the given job may not require those specific competences.
- **Step 3.** After that, field experts (professionals, human resources managers, vocational training specialists, etc.) can be consulted in order to identify the digital aspects of job tasks in detail and the competence descriptors necessary for the technical solutions used in the selected job. DigComp descriptors are by their nature written in general terms, to be applied in different contexts, but they can form a useful basis to articulate job-related specifications. As a result, the same DigComp competence may have, in practice, different detailed descriptions, depending on the prevailing tasks of different occupations.
- **Method:** Complementary methods to define the digital competence needs in specific occupations can be: focus groups, direct interviews and online surveys, with DigComp always utilised as a reference vocabulary and guide.

Resources

DigComp into Action guide

contains a description of the cases provided in the Examples Section.

DigComp at Work report

Section 2.3 - How DigComp is helping stakeholders, sub section The use of DigComp for the analysis of competence requirements and the definition of professional digital profiles (pp.20-24) details how the different cases analysed have made use of DigComp to define a PDP. More in particular:

- **T7** lists the aims of the PDPs defined by the different cases and the sets of (digital, advanced digital and soft) skills considered
- **T8** details the complete list of PDPs defined by the different cases
- **T9** provides an analysis of the DigComp digital competences and levels used across PDPs.

The Annex provides a detailed description of each case.

In addition, the following resources are available:

- **C3** IKANOS Professional digital profiles
- **C3** IKANOS Guide for professional digital profiling
- **C3** IKANOS Tool 4: Ikanos Professional Digital Competence Profiles
- **C6** MU.SA report: Emerging Job Profiles for Museum Professionals
- **C6** MU.SA Tool 5. Linking eCF, EQF and DigComp competences of the 4 new Mu.SA PDP
- **C6** MU.SA Tool 6. Transferable competences of the 4 new Mu.SA digital profiles.

S2 **Assessing competences:** assessing and/or certifying the digital competences of a job seeker or employee, of an organisation, or of a part of it

What is to be produced

Assessment tools support **awareness development, evaluation or certification** of the level of digital competence of an individual or organisation.

Assessment and self-assessment may take place in different contexts and have **different purposes**. An important distinction is to be made: while 'assessment' refers to a process where the user's digital competence is evaluated by a second party (and therefore leading to an objective rating and possibly to a certificate), 'self-assessment' refers to the user perceiving its digital competence by its own, i.e. a subjective dimension is added.

Different approaches to testing and **types of questions** may be used:

- **Self-perception or self-reflection questions** ask respondents how confident they feel with respect to a topic or activity, what or how much they know and/or are able to do, or what the actual behaviour is. They play a very important role in helping people to understand their digital competence.
- **Knowledge-based questions** check whether the respondent knows a given piece of knowledge, knows the right action to achieve a result or the right behaviour in a given circumstance by picking the right answer among a set of options. They check factual knowledge and/or procedural knowledge. They provide a more accurate picture of a user's digital competence compared to self-perception or self-reflection questions.
- **Performance-based questions** require users to perform some tasks in order to give the requested answer or complete an assignment. This approach generates the most accurate picture of one's digital competence.

DigComp components (competence descriptors, learning outcomes at different proficiency levels, examples of skills, knowledge and attitudes) can be used to prepare self-perception, self-reflection and knowledge-based questions or as a reference to for more detailed and contextualised questions. They can also inspire the definition of authentic tasks and challenges for evaluation of both knowledge-based and performance-based perspectives.

Some criteria for choosing the type of questions to be used:

- Self-perception and self-reflection questions used in self-assessment tests will help users become aware of the wide scope of digital competence that they have not previously considered or been aware of. These tests can also be used to identify how respondents feel (rather than measuring their initial competence), before recommending them to take an initial digital competence course.
- Knowledge-based and self-perception and self-reflection questions are the most manageable, can be administered through online procedures and can deliver more immediate feedback.
- Performance based questions either require sophisticated simulations or administration of real-life challenges. Both approaches require more complex technical solutions, including for automated verification, direct observation and/or intervention of an evaluator. Hence, tests that make use of these questions can take longer to be executed.
- Each approach to testing, and hence, the complexity, quality and reliability of the measurement tool (and related costs) need to be adapted to the purpose. For example, a certification tool would require a more complex and reliable measurement than a self-assessment test or a pre-training assessment test. In particular, building a valid and reliable assessment tool is a task of significant complexity that requires a multi-disciplinary team with know-how on meas-

urement tools design, psychometric analysis and digital competences, as well as significant investment in development, operational and maintenance costs.

- Taking into account the above, reusing or sharing certification platforms, systems, questions or even services are probably effective alternatives to starting from scratch.

An important output of the assessment and self-assessment processes is the **feedback or results** provided to the user. This will depend on the context and purpose of the assessment. Different types of **certificates or credentials** can be provided to the user as a result of an assessment test. So far, the cases analysed issue two types of digital credentials for learning achievements: certificates and badges. The choice of format reflects what is commonly seen today among credential issuers:

- **Digital certificates** are used when an achievement takes a long time to complete (e.g. a course that takes more than 40 hours); assessment of the achievement is formal (summative with proctored and assessed examination); employers are likely to view the achievement (e.g. professional certification of a skill).
- **Digital/Open badges** are used when an achievement does not take too long to complete (e.g. an online course that takes 2 hours); assessment of the achievement is informal (formative, as with an unmarked quiz); recipients complete many achievements of a similar type (e.g. a set of modules within a longer course, or a university degree).

(this summary is drawn from www.accredible.com/credentials/)

Purpose

Digital competence assessment tests may be taken by different entities for different purposes in different contexts:

By individuals:

- to **develop** their self-**awareness** of their own level of digital competences in each of the DigComp (5) areas and (21) individual competences; to benchmark one's digital competence profile with others in the labour market; or to decide on a learning path
- to obtain a digital competence or PDP badge or **certification** for employability purposes or other reasons (e.g. following a regulatory requirement)
- to **identify the gaps** between the individual current competences' level and those needed for a particular job (defined through a PDP), identify the available training offers that address the specific competences and related level needed and **develop a personal development plan**.

By training providers:

- to assess participants' skills **before starting a course** to provide advice on personalised learning paths
- for **summative assessment** purpose during a course
- for issuing a final course **badge or certificate** (depending on how the course and the assessment are organised, these credentials may refer to specific DigComp areas or competences, to a specific course completion or to a specific PDP profile).

By employers (companies or other organisations):

- to support candidate's **selection processes** for specific vacancies
- to **map employees' profiles** and identify their training needs and paths

- to support **digital transformation processes**, by identifying talents and potential digital champions and monitoring improvements
- for **organisation-level analysis** and benchmarking with sectoral data.

By employers' (sectoral) associations:

- for **sector-level analysis**, by aggregating a large number of test results, in order to plan training and learning activities to overcome sectoral competence gaps.

By (public and private) employment services:

- in support of their **job matching** and **career advice functions**.

Examples

DigComp into Action guide and DigComp at Work report include a number of cases that have developed different types of tests, some of which are available on-line.

In the DigComp into Action guide:

- **C2**, **T2** IKANOS Self-assessment tool for **any citizen**
- **C12** PIX web platform for Digital skills evaluation and certification for **any citizen**
- **C16**, **T11**, **T12** ELENE4WORK Self-assessment tool for **students** and **young workers**
- **C17** DIGITAL COMPETENCE WHEEL for **adult citizens** in Danish and in English, for **teachers, students** and **employees** of both private and public organisations, available in Danish
- **C21** BRIDGE THE DIGITAL GAP (GINOP-6.2.1) Self-assessment tool for the basic two levels of l**ow skilled working age population**
- **C27** TRAINING CIVIL SERVANTS IN SPAIN, self-diagnostic pre-training test for **civil servants**
- **C29** DIGITAL INNOVATIONS FOR G ROWTH ACADEMY, for **Enterprise Trainers** and **Educators**.

In the DigComp at Work report:

- **C3** IKANOS self-assessment test (standard version), for **all citizens**, available in Euskera, Spanish and English
- **C5** COMPASS self-assessment test for **low skilled unemployed youth**, to guide the user towards a learning path
- **C7** SMARTIVEMAP self-assessment test standard version. available in Italian and in English, for **organisations**
- **C8** PATHWAYS4EMPLOY self-assessment test **Virtual office worke**r and **Entrepreneur profiles**.

Key Actions

Define your specific requirements:

- Clarify the **purpose** and the **nature** of the test (self-assessment or assessment) and the target audience.
- Decide the **type of measurement**: per competence area, competence or other grouping criteria.
- Decide the **type of questions** to be asked, based on the test's purpose.
- Decide the **contextual conditions** of the test: financial resources, maximum time to carry out the test, number of questions (per competence, area or group), the size of the pool of questions.
- Decide about test **management aspects**: the need for an advertising campaign to target audiences, test registration procedures, and management procedure for claims to the test results.
- Decide the test **operational conditions**: if the instrument will be self-administered or assisted, the location where the test will be administered, i.e. on-line or on a specific physical location, and if the user will have (limited) access to internet or not, and the compatibility of this choice with knowledge-based questions.
- Decide the **type of feedback** and output that will be provided to the user.
- Consider if the test results are to be integrated in a **personal learning environment** (e.g. an e-Portfolio, internal HR system), to support competence development in a lifelong learning context.

Before starting the development of the assessment tool:

- Explore if synergies can be developed with actors already administering tests in your local environment or in another region or country to reduce costs and time required.
- Analyse if any components can be (re-) used, complemented or shared such as questions, platforms, services, or even the [type of] digital credentials issued (presuming they can be recognised in another context).

A number of technical design and quality tasks in relation to the implementation of the **measurement instrument** need to be considered. For example:

- the different measurement approaches needed to test knowledge, skills and attitudes, to comply with the definition of competence
- to ensure that the instrument is psychometrically sound (good validity and reliability are two main psychometric characteristics of a sound instrument)
- to identify who will write and review the questions
- to ensure the set of questions is moderate, non-redundant, and sufficient, taking into account a good distribution of questions per competence and proficiency level
- to design how responses will be linked to competence proficiency levels
- to tackle common problems like the tendency to over or undervalue individual's responses to self-perception questions (the introduction of fake questions can be considered)
- to pilot the instrument with an acceptable sample of test-takers
- or to acknowledge the limitations of the instrument, to name a few.

See the Resources Section for some useful sources on the above matters.

Tips

- Paying due **attention to end users' profiles and needs** becomes crucial. DigComp was intentionally designed for all citizens, not for a specific category of people. Citizens, however, have diverse educational levels and backgrounds, mastery of the local language, and experience with the digital world and so on.
- Although DigComp is **technology neutral** in assessment and training contexts, it is necessary to use some concrete tools. Combining commercial and open source tools can be a suitable choice.
- For competence assessment, it is important that DigComp's descriptors and related examples are "translated" into concrete **questions that use plain language and refer to everyday circumstances** or popular examples. The questions' wording should be adapted to the target groups.
- **Performance based questions** might be more difficult to implement to measure some competences. Implementation options include simulation environments vs. real life challenges and automated vs. manual verifications. Although the desired options would be automated verification of real life challenges, these are not always feasible.
- **Measuring user' attitudes** with sufficient reliability (for certification purposes, for example) remains a complex issue. Items that combine knowledge and attitudes may be a practical option in some cases. Providing separate evaluation results for attitudes may be another option. In self-assessment tests, this issue is however less relevant.
- The fast **evolution of the digital technologies** needs to be carefully considered in the design and updating of measurement instrument which can have an impact on maintenance costs.

Considerations on the questionnaire's length:

- A questionnaire addressing all 21 DigComp competences may be long. The questionnaire should thus be carefully designed to avoid that respondents do not finish it. An approach focusing on a set of competences may be suitable to address this challenge.
- Questionnaires could present some initial questions that can immediately filter low-competence respondents and allow them to end quickly the questionnaire.
- Questionnaires can also be self-scalable adapting the number of questions depending on the level of the respondent on each competence.
- Longer and deeper assessment processes could be used for those with a higher level of digital competence and incorporate more entertaining and engaging elements, while being a source of useful information and learning.

Resources

DigComp into Action guide provides a set of examples (see Section Step 2: Competence Assessment pp. 34-35 and the Annex).

In addition, the following resources and tools are available:

- **T13 Digital competence self-diagnosis tool of the andalusia regional government**, for all citizens
- **T14** ABC DIGITALE: Self-assessment test and Digital learning opportunities, for people of **all ages**, especially **children**, **youth** and their **parents**
- **T16** SKILLAGE: Online self-assessment Tool on Digital Skills for the **Job Market for youth**
- **T17** TUCERTICYL: The Digital Competence Certification system in Castilla y León, Spain, for **all citizens**
- **T17** TUCERTICYL: open-source software platform and database of over 1,400 questions for the certification of citizens' digital competences, available for free to any other public organization within the EU, and already shared with the regional government of Andalusia (Spain) to work jointly in the certification on digital competences
- **T17** TUCERTICYL: demo of a certification test
- **T18** Digital self-assessment tool for **employees and managers** of the Dach Region.

DigComp at Work report includes several additional resources:

Table T.4, under Fostering transparency of skills and qualifications lists the cases that have developed assessment and certifications of skills.

Section 2.3 - How DigComp is helping stakeholders, sub section The use of DigComp for assessment tests, recognition and certification (pp.24-26) details how each case has made use of DigComp. In particular, T10 details which types of tests, uses and outputs are implemented in each of the cases.

The Annex includes a detailed description of the example cases provided and related resources.

In addition, the following related resources are available:

- **C1** Tool 1. Regione Emilia-Romagna´s Entry questionnaire on digital competence for 3i Digital literacy courses
- **C1B** DCDS Contents of the self-assessment tool
- **C3** IKANOS Standard Ikanos Self-assessment Test (SAT)
- **C5** COMPASS Self-assessment test
- **C7** SMARTIVEMAP Free SmartiveMap self-assessment test
- **C7** SMARTIVEMAP Corporate SmartiveMap self-assessment test
- **C8A** BAIT Self-assessment test
- **C8A** PATHWAYS4EMPLOY Self-assessment test
- **C9** ADECCO Company Digital Maturity Test
- **C9** ADECCO PHYD Platform, that aims to support people to evaluate, maintain, and increase their employability, in a life-long learning perspective.

References on the development of measurement instruments:[6]

- Bing, M. N., Kluemper, D., Davison, H. K., Taylor, S., & Novicevic, M. (2011). Overclaiming as a measure of faking. Organizational Behavior and Human Decision Processes, 116(1), 148-162.
- Cizek, G. J. (2012). The forms and functions of evaluations in the standard setting process. Setting performance standards: Foundations, methods, and innovations, 165-178.
- Cizek, G. J. (Ed.). (2001). Setting performance standards: Concepts, methods, and perspectives (Vol. 510). Mahwah, NJ: Lawrence Erlbaum Associates.
- Cizek, Gregory J., and Michael B. Bunch. Standard setting: A guide to establishing and evaluating performance standards on tests. SAGE Publications Ltd, 2007.
- Cronbach, L. J. (1988). Five perspectives on validity argument. Test validity, 3-17.
- DeMars, C. (2010). Item response theory. Oxford University Press.
- Gibbons, R. D., & Hedeker, D. R. (1992). Full-information item bi-factor analysis. Psychometrika, 57(3), 423-436.
- Gibbons, R. D., Bock, R. D., Hedeker, D., Weiss, D. J., Segawa, E., Bhaumik, D. K., ... & Stover, A. (2007). Full-information item bifactor analysis of graded response data. Applied Psychological Measurement, 31(1), 4-19.
- Hambleton, R. K., & Pitoniak, M. (2006). Setting performance standards. In R. L. Brennan (Ed.), Educational measurement (4th ed., pp. 433-470). Westport, CT: Praeger.
- Hambleton, R. K., Swaminathan, H., & Rogers, H. J. (1991). Fundamentals of item response theory. Sage.
- Holden, R. R., & Passey, J. (2010). Socially desirable responding in personality assessment: Not necessarily faking and not necessarily substance. Personality and Individual Differences, 49(5), 446-450.
- Jodoin, M. G., & Gierl, M. J. (2001). Evaluating type I error and power rates using an effect size measure with the logistic regression procedure for DIF detection. Applied measurement in education, 14(4), 329-349.
- Koretz, D. M. (2008). Measuring up. Harvard University Press.
- Kruger, Justin; Dunning, David (1999). Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments. Journal of Personality and Social Psychology. 77 (6): 1121–1134.
- Lindquist, E. F. (1951). Preliminary considerations in objective test construction. Educational measurement, 119-158.
- Messick, S. (1998). Test validity: A matter of consequence. Social Indicators Research, 45(1-3), 35-44.
- Mitzel, H. C., Lewis, D. M., Patz, R. J., & Green, D. R. (2013). The bookmark procedure: Psychological perspectives. In Setting performance standards (pp. 263-296). Routledge.
- Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. Structural equation modeling, 9(4), 599-620.
- Oliver JP. and Veronica Benet-Martinez. "Measurement: Reliability, construct validation, and scale construction." Handbook of Research Methods in Social and Personality Psychology, edited by H.T. Reis and C.M. Judd. New York: Cambridge University Press, 2000, pp. 339-369.

6 Extracted from Pokropek, A (2020) Methodological guide on constructing and validating reflection, self-assessment and measurement instruments (JRC internal document)

- Paulhus, D. L. 1991. “Measurement and control of response bias.” In J. P. Robinson, P. R. Shaver, and L. S. Wrightsman (Eds.), Measures of personality and social psychological attitudes (pp. 17-59). San Diego, CA: Academic Press.
- Paulhus, D. L., Harms, P. D., Bruce, M. N., & Lysy, D. C. (2003). The over-claiming technique: Measuring self-enhancement independent of ability. Journal of personality and social psychology, 84(4), 890.
- Phillips, D. L., & Clancy, K. J. (1972). Some effects of” social desirability” in survey studies. American Journal of Sociology, 77(5), 921-940.
- Reise, S. P. (2012). The rediscovery of bifactor measurement models. Multivariate behavioral research, 47(5), 667-696.
- Reise, S. P., Moore, T. M., & Haviland, M. G. (2010). Bifactor models and rotations: Exploring the extent to which multidimensional data yield univocal scale scores. Journal of personality assessment, 92(6), 544-559.
- Rost, J. 1991. “A logistic mixture distribution model for polychotomous item responses.” British Journal of Mathematical and Statistical Psychology 44:75–92.
- Snow, Eric & Katz, Irvin. (2009). Using cognitive interviews to validate an interpretive argument for the ETS iSkills™ assessment. Communications in Information Literacy. 3. 10.15760/comminfolit.2010.3.2.75.
- Van der Linden, W. J. (1998). Optimal assembly of psychological and educational tests. Applied Psychological Measurement, 22(3), 195-211.
- Wang, N. (2003). Use of the Rasch IRT model in standard setting: An item-mapping method. Journal of Educational Measurement, 40(3), 231-253.
- Wilson, M. (2004). Constructing measures: An item response modeling approach. Routledge.
- Wright, B. & Stone, M. (1979). Best test design. MESA Press: Chicago, IL

S3 **Training:** cataloguing, designing, developing and delivering training on digital competences

What is to be produced

The identification and/or design of training content for digital competences can follow different, complementary processes:

Mapping and cataloguing existing digital competence courses to DigComp is an important process:

- to make most of existing training resources
- to enable sharing existing resources among organisations, regions, countries, etc.
- to facilitate the identification of existing training gaps to facilitate the preparation of training development plans, and
- to enable a greater diffusion of existing DigComp-compliant training offer.
- Either manual (can be laborious) or automated analysis of online training offers can be carried out.
- The more similar the cataloguing approaches are among stakeholders, the easier will be the sharing of training resources.

Comparing existing training offers with the DigComp competences to be developed can highlight competence and level gaps to be filled.

- **Training design** which involves the specification of learning outcomes and training content based on user needs and guided by DigComp components.
- **Training development** based on in-depth user needs analyses which identify training priorities and content in view of user profiles, the professional digital profiles or the development goals defined in terms of DigComp (and possibly other) competences.

Some relevant course design and development aspects:

DigComp's value is in giving structure and direction while maintaining openness and flexibility to digital competence development initiatives. Openness and flexibility offer the opportunity to address the needs of specific target groups and their context, rather than imposing pre-defined solutions.

Delivery mode:

- Training can be delivered either fully on-line, face-to-face in the classroom or in a blended form, i.e. as a combination of the previous two.
- If full on-line training will be provided, it is recommended that courses also include an introductory basic course for those with no experience at all, to be able to follow the course.
- It has to be considered that face-to-face teaching and peer interaction are more suitable for learners with low educational background and low digital skills, especially at the beginning of the learning process.

Course design elements:

- Definition of the structure of the training modules. This can be done aligned to the DigComp 21 competences and 5 competence areas, or adapted to the course objectives and context.
- Definition of the objectives, composition and duration of each training module.
- Assigning the learning outcomes to each competence proficiency level.
- Design of the desired learning paths towards an overall objective as a series of modules to be followed.
- The adoption of a microlearning approach to facilitate training of busy employees could be envisaged (see as an example Anglia Ruskin University's Five Days of Digital Literacy (5DODL) initiative, DigComp into Action guide T1 p.120).

Evaluation design:

- Definition of the "pass" criteria and tests for each learning module.
- Design the criteria for the attribution of learning badges to modules, and how module learning badges constitute a certificate for a specific course.
- Design if and how the result of the training evaluation will be included in a personal ePortfolio as a storage component of a Personal Learning Environment, to support continuous digital competence development in a life-long learning perspective.

Content validity:

- An important criterion in training content selection and production is to minimize its rapid obsolescence risk, which can be addressed by avoiding focusing on specific software tools and rather focusing on competences to be developed, on services and their access. DigComp´s technology neutrality and the general treatment of many topics have proved particularly useful to cope with this requirement.

Openness:

- The question on commercial vs open educational resources (OER) needs to be considered (if and how).

Separation of training design from delivery: when the design and development of a training offer is done by a different entity from that delivering the training, tasks may be separated as follows:

1. Development of methodological documentation and training guides for educators such as syllabi, learning outcomes, and guide for exam´s participant
2. Training development, training delivery and evaluation.

Purpose

Training courses can be developed with several purposes and addressed to different audiences. Some of these are outlined here:

- Develop / provide a **full training offer** for all DigComp areas and competences at all levels (although this is unlikely in the world of work, where normally some content priorities and target users would be specified, given actual user proficiency levels). See the Cases of ECCC (4) and DCDS (1) of DigComp at Work report.
- Develop a s**pecific training offer adapted to a professional sector and jobs** (possibly defined making use of PDPs) to be used by employers or training, employment or career advice organisations to increase the employability of candidates aiming to apply for a particular job position.
- Develop a training offer targeting the needs of **specific groups of people** (introduction and lower level courses for those with no digital competence and experience, courses addressed to older people, increasing employability of young people, etc).

Examples

DigComp into Action guide and DigComp at Work report describe a set of cases, some of which offer online resources, in particular:

DigComp into Action guide includes 36 examples relevant to the training related activities (p.33 and pp. 39-40) of which a selection is provided here:

- **C16** ELENE4WORK has compiled 200 MOOCs and OERs for Students and young workers and a guide on how to use them
- **C20** CODEMOB Curriculum to train e-facilitators working with youth; Curriculum for e-facilitators to train young people at risk of social or economic exclusion; Course materials for e-facilitators working with youth
- **C21** BRIDGE THE DIGITAL GAP (GINOP-6.1.2) training package for the basic two levels of DigComp with study materials for low skilled working age population
- **C27** INAP (Instituto Nacional de Administración Pública) Training model for public administration civil servants in Spain
- **C29** DIGA: Digital Innovations for Growth Academy: Training for Enterprise Trainers and Educators, and a Learning Programme Guidance on how to use the materials and resources along with further information for programme facilitators. Available in English, Lithuanian, Slovenian, Bulgarian and Spanish.

DigComp at Work report:

- **C1** PANE E INTERNET designed and developed **basic literacy courses** and the 3i (informatica, inglese, industria) informatics courses for **unemployed people** run within public employment services
- **C1** DCDS designed and developed a blended learning system to develop **all 21 DigComp competences at level 1-2**, aiming at **adults 25+ years old**
- **C2** PRODIGEO designed and developed Digital Competence courses for (public and private) **employment services staff**
- **C3** IKANOS **Training Orientation Guide, Guide to Catalogue** the existing training offer, and **Personal Learning Environment**
- **C4** ECCC is an example of an organisation defining the **methodological and training requirements**, but not developing nor delivering the training
- **C5** COMPASS Training Course for **unemployed low skilled youth**
- **C6** MU.SA developed a modular training path and related tools (including a MOOC) to develop specific to the PDP digital competences for **museum professionals**
- **C8B** BAIT designed and developed a training offer for current and future **civil servants**.

Key Actions (for training design)

Step 1: Training Definition

- Define the **purpose** of the training, its **target beneficiary group** and their **needs** (both digital competences and related soft skills).
- This definition task should involve digital competence experts, education professionals, employers ´ Human Resource managers and managers, employment professionals and employees corresponding to the Professional Digital Profiles.
- Refer also to the S1. Defining competence needs Section of this guide and the development of PDP.
- The analysis methods used can include focus groups and interviews. In all cases, DigComp should be thoroughly explained to all intervening stakeholders and used to define the user needs.
- It is relevant to think what level of digital competence proficiency can be realistically expected/aimed at in general terms, given the target users' characteristics (e.g. education background, age, employment conditions and perspectives etc.) and the broader context and goals of the initiative (e.g. retraining people who lost their job and want to re-enter into the labour market; overcoming condition of total digital exclusion, and so on).
- The outcome of this step would be the list of **DigComp digital competence areas, individual competences and proficiency levels** that need to be taught.

(Optional: in the case user needs have been defined without the use of DigComp)

Step 1b: Mapping users' targeted competences onto DigComp

- The list of targeted digital competences (and levels) should then be compared and/or mapped onto the DigComp framework's descriptions and examples. A good way of doing this is clustering the results from the needs analysis with DigComp competences, or mapping them to a competence area might be sufficient. Then, proceed with checking how much the two sets of descriptions match with one another. Once this is done by area or competence, the levels can also be mapped.
- The comparison may reveal that some competences (and levels) in DigComp have been overlooked in the step 1 analysis and therefore should be added to the list of targeted digital competences, in order to aim at a fuller digital competence development. The comparison may also reveal that some desired/targeted competences or components are not included in DigComp, and therefore need to be addressed through complementary tests for these competences.
- This part of the exercise may turn out to be somewhat complex to perform. In some cases, the precise meaning of DigComp's descriptors and examples is not straightforward, in other cases the level of abstraction and details of the descriptions being compared will likely be different. This is the step where a process of interpretation/specification of DigComp's content is necessary.

Step 2: Define goals, descriptors and learning outcomes

- DigComp is a framework that suggests a way of looking at and developing the digital competence of citizens, without providing a standardised, detailed and compulsory solution for it.
- To apply DigComp for different purposes or contexts, you must "translate" the framework's descriptions and examples to fit the specific target groups ´ needs.
- Next, choices must be made about the digital applications, services and devices, the pieces of knowledge, the examples of attitudes etc. that can best illustrate the selected DigComp competences and levels for the implementation with the end users.

Step 3: Design and develop training courses

- Before developing the training, perform an **analysis to identify if existing courses** can address the training needs and the gaps to be addressed
- **Delivery mode:** decide which training delivery mode will be used according to the project context and target users.
- Decide if **MOOCs** are a good option for the training delivery.
- **Open sources:** decide if the training material developed will be made accessible and how.
- **Course design** (see considerations in the What is to be produced Section above).
- For the courses to be developed, define and develop **training content and activities** consistent with the learning needs and target levels.
- Consider **who will deliver the training:** trainers may need to be trained as well, as teaching "digital competences" is quite different from training on the use of digital devices, applications and services.

Step 4: Evaluation and assessment

- Decide how the **evaluation** will be performed and **credentials provided** (see S2 Assessing Competence Section).
- Consider if a **self-assessment tool** is needed to identify the learners' previous knowledge so as to allow to **customize their personal learning** path based on the competence objectives to be acquired, eventually defined by the PDP.

Tips

For Step 2:

- Taking as an example **DigComp competence 4.1 Protecting devices**, the example: "Is able to install an anti-virus" may be substantiated in various ways. It could be turned simply into the suggestion of a specific software and the step-by-step guidance to the installation of its free version. Alternatively, it may include learning how to purchase online the licence for the professional version of that software, and possibly knowing about the availability of several anti-virus software products on the market, and learning which criteria to follow in order to compare them and make a choice.

  DigComp focuses attention on device protection and recommends that users should be able to install an anti-virus software: all the other aspects just mentioned have to be addressed and decided in the implementation process.

For Step 3:

- Detailed choices have to be made about learning activities, their duration, and the materials to use, in view of each targeted competence and proficiency level. As there is no established system to guarantee ex-ante that given choices will produce the expected learning outcome, detailed design choices have to be made. Sharing with a larger group of experts and teachers can be a good option to improve the effectiveness of the design and to achieve wider consensus among those who will have to implement them. Feedback and adaptation mechanisms must also be envisaged to incorporate learnings from practice.
- Liaise with relevant stakeholders that are knowledgeable on training design, the content of the course (possibly with some teaching experience) and the needs of the target group, so as to develop a meaningful course content. These stakeholders can be VET organisations, employment services organisation, employers or employer associations, unions.

Resources

DigComp into Action guide:

- Provides a set of indications on Adaptation and specification (pp. 31-33) with a list of examples.
- Provides a set of indications on Training Trainers and end-user learning (pp. 37-40) with a list of examples.
- The Annex includes a detailed description of the cases provided in the Examples Section.

Related to the above cases, the following resources are also available:

- **C24** Digital Competence Self-Diagnosis Tool of the Andalusian Regional Government, Spain, **Guide for cataloguing training resources based on DigComp with a view to incorporate them into an information system**. (Email contact)
- **T17** TUCERTICYL, MOOC on DigComp, provides an introduction to DigComp and provides training at basic-intermediate level.

DigComp at Work report includes several resources**:**

- Table T.4, under Support for adult learning lists the cases that have designed and developed and delivered training offers and or carried out workforce development.
- Section 2.3 How DigComp is helping stakeholders, sub section The use of DigComp to design training offers (pp.26-27) details how each case has made use of DigComp.
- The Annex includes a detailed description of the cases provided in the Examples Section, and related resources.

In addition, the following resources are available:

- **C1** PANE E INTERNET learning resources (in Italian)
- **C1** DCDS Digital Competence Development Methodology
- **C2** Anpal´s YouTube playlist contains all Prodigeo's videos
- **C2** PRODIGEO **TOOL 3**. Digital Competence course videos on YouTube (in Italian) for a set of DigComp competences
- **C3** IKANOS **Guide for training providers to catalogue their offer** (available by end 2020) according to DigComp categories, so as to obtain a DigComp label and to facilitate matching self-assessment test results (showing gaps in given competences) with available training offers
- **C3** IKANOS **Orientation Guide for intermediaries** (available by end 2020) which explains how to use the self-assessment results to help customers choose/design effective learning paths towards selected job profiles
- **C3** IKANOS has developed an **ePortfolio** as the storage component of the Ikanos Personal Learning Environment (iPLE). An ePortfolio will be online as example to follow
- **C4** ECCC Syllabi in Polish: and in English
- **C4** ECCC Learning outcomes in Polish
- **C4** ECCC DigComp 1.0 report in Polish
- **C4** ECCC DigComp Handbook for Trainers and trainees (in Polish; partly in English and Ukranian)
- **C4** ECCC DigComp handbook for trainers and trainees available in 2 versions: volume 1 with 3 DigComp areas and volume 2 with the other 2 areas; or one book with all 5 areas. Table of contents in English is available
- **C5** COMPASS Training Course
- **C6** MU.SA MOOC on Essential digital skills for museum professionals

ACKNOWLEDGEMENTS

The author would like to thank Alessandro Brolpito (European Training Foundation), Stefano Kluzer (Consultant), Roberto Lejarzegi (Ibermática, Spain), José Antonio González Martínez and Graciela Parrilla Ramírez (TuCertiCyl, Regional Government of Castilla y León, Spain) and Gabriel Ángel de la Cuesta Padilla (Regional Government of Andalucía, Spain) for their review of earlier versions of this Guide, providing practical and inspirational recommendations for its improvement.

The author would also like to acknowledge the valuable expert support provided by her European Commission JRC colleagues Yves Punie and Marcelino Cabrera.

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/index_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by electronic mail via: https://europa.eu/european-union/index_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications from EU Bookshop at: https://publications.europa.eu/en/publications. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/index_en).

KJ-NA-30204-EN-N

Publications Office
of the European Union

The European Commission's science and knowledge service

Joint Research Centre

JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.

EU Science Hub

ec.europa.eu/jrc

@EU_ScienceHub

EU Science Hub - Joint Research Centre

EU Science, Research and Innovation

EU Science Hub

doi:10.2760/936769
ISBN 978-92-76-18581-9