Developing digital competence for employability:

Engaging and supporting stakeholders with the use of DigComp

Centeno, Clara
Vuorikari, Riina
Punie, Yves
O´Keeffe, William
Kluzer, Stefano
Vitorica, Ana
Lejarzegi, Roberto
Martínez de Soria, Iker
Bartolomé, Juan

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DigComp:
The European
Digital Competence
Framework

European Commission

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Contact information
European Commission
Joint Research Centre
Directorate Growth & Innovation

Edificio Expo. c/ Inca Garcilaso, 3.
E-41092 Seville (Spain)
E-mail: JRC-B4-SECRETARIAT@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300
http://www.ec.europa.eu/jrc

EU Science Hub
https://ec.europa.eu/jrc

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Foreword

Digital competence has become crucial for employability. The **Skills Agenda for Europe** aims to improve the quality and relevance of training and other ways of acquiring skills, make skills more visible and comparable and improve information and understanding of skills intelligence to enable people make better career choices, find quality jobs and improve their life chances. In support of the development of digital competence among Europeans the European Commission developed the Digital Competence Framework for Citizens, also known as **DigComp**, which defines what competences are needed to become digitally competent.

A key challenge is for employees and job-seekers, who may not have experience or confidence with their digital skills yet the nature of their jobs, the sectors they work in and their lives are increasingly influenced by digitalisation. This report aims to provide some light to the question of which policy options could, in a practical and effective way**,** encourage and support labour market intermediaries in their digital skilling actions, with the use of DigComp. The report has been prepared through a collaborative work between the European Commission Joint Research Centre, the Basque Government and a set of experts, on behalf of, and in collaboration with Directorate General of Employment, Social affairs and Inclusion.

The report is part of the JRC research on "Learning and Skills for the Digital Era" which has been undertaken, since 2005, around 30 major studies on these issues, resulting in more than 120 different publications. Recent work has focused on the development of digital competence frameworks for citizens (DigComp), educators (DigCompEdu), educational organisations (DigCompOrg) and consumers (DigCompConsumers). A framework for opening up higher education institutions (OpenEdu) was also published in 2016, along with a competence framework for entrepreneurship (EntreComp). Some of these frameworks are accompanied by self-reflection instruments, such as SELFIE, focussed on digital capacity building of schools.

In 2019, JRC started working, on behalf of DG EAC, on a new competence framework for Personal, Social and Learning to Learn competences (LifEComp). Background research for the new LifEComp framework was published early October 2019.

In addition, a series of 4 reports were published on innovating Continuous Professional Development, in school education and higher education, as well as a methodological guide on conducting evaluations of the provision of open digital textbooks. In addition, practical guidelines on open education for academics were released. Past research has been undertaken on Learning Analytics, MOOCs (MOOCKnowledge, MOOCs4inclusion), Computational thinking (Computhink), policies for the integration and innovative use of digital technologies in education (DigEduPol), and the potential of blockchain in education.

More information on the workshop can be found at the Ikanos site https://www.ikanos.eus/jrc-workshop/ and more information on all our studies can be found on the JRC Science hub: https://ec.europa.eu/jrc/en/research-topic/learning-and-skills .

Acknowledgements

We would like to thank the Basque Government, the Ikanos project, and in particular the project Director Ana Vitorica, for hosting the event in the city of Bilbao, for the local organisation and support.

Special thanks to Ana Vitorica and Stefano Kluzer for their contributions to the overall design and content of the workshop, for mobilising high-level speakers and participants who have made valuable contributions to the event.

We also want to thank for their contribution to the event organisation: of the parallel group sessions Roberto Lejarzegi from Ibermática and Iker Martínez de Soria and Juan Bartolomé from Tecnalia, and for the logistical support Aranzazu Gámez and Idurre Apraiz from Enpresa Digitala, Initiative of the Basque Business Development Agency.

Thanks to all presenters, panellists and workshop participants who, by sharing their knowledge and experience in a friendly and constructive spirit, have contributed to the production of the content of this consultation report, concretely (in alphabetical order) Juan Bartolomé, Alessandro Brolpito, Miguel Ángel Castillo, Jon Charterina, Eva Chimeno, Gabriel de la Cuesta Padilla, Monique de Ridder, Hugo Dionisio, Federico García Sacido, Anne Green, Mara Jakobsone, Achilles Kameas, Kirsi Kekki, Stefano Kluzer, Roberto Lejarzegi, Pasquale Lovino, Filippo Mantione, Iker Martínez de Soria, Marco Mazzini, Lisa McMullan, Marek Milosz, Tamara Pavlic, Patxi Sasigain, Nicoletta Staccioli, Iñaki Tellería, Gori Yahaya.

Thanks to the note takers Riina Vuorikari, Stefano Kluzer, Roberto Lejarzegi, Iker Martínez de Soria and Juan Bartolomé, instrumental to the preparation of this report.

Thanks to JRC colleagues Lola Romero, for her invaluable help in organising the logistics and administration and to Yves Punie and Riina Vuorikari for their intellectual support in this adventure.

Final thanks to our DG EMPL colleague William O´Keeffe, for his encouragement and support in the preparation and running of the event, as policy officer and receiver of the workshop outcomes.

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1. Introduction

1.1 Policy context

Key skills trends in employability context

Digital competence has become crucial for employability. Not only considering its role as a transversal skill to develop employability, but also because about 85% of all EU jobs need at least basic digital skill level[1].

The most recent available statistics collecting digital skills in Europe[2] for the year 2017 show, however, that 43 % of the EU population had an insufficient level of digital skills (no skills or low level). Furthermore, for the same year, 10 % of the EU labour force had no digital skills, mostly because they did not use the internet, and 35 % did not have at least basic digital skills, which are now required in most jobs.[3]

The pace of change is accelerating due to the digital transformation bringing *robotisation* and *cobotisation*[4] of an increasing number of tasks[5]. This is confirmed by recent Eurostat data[6] showing that the job tasks of 16% of employed internet users in the EU had changed due to new software or computerised equipment in the twelve months prior to the survey, 29% had to learn how to use new software or equipment for their job. At the same time, almost half (47%) of employed internet users in the EU assessed their skills relating to the use of computers, software or applications at work as adequate for their duties, while 9% admitted that they needed further training.

Beyond digital skills, the set of skills required by the labour market is evolving. The first results from CEDEFOP´s real-time labour market information project[7] in March 2019, unveil the following top 10 skills requested in job vacancies: *be adaptive to change, work well in team, use office software, assist customers, use a computer, solve problems, communicate well, be creative, be able to prioritise, manage projects*.

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[1] Cedefop (2018) *Insights into skills shortages and skill mismatch*, at: http://www.cedefop.europa.eu/en/publications-and-resources/publications/3075

[2] Provided by Eurostat, under the Digital Economic and Society Index (DESI) for the year 2017

[3] *Cedefop (2018) Insights into skills shortages and skill mismatch, at: http://www.cedefop.europa.eu/en/publications-and-resources/publications/3075*

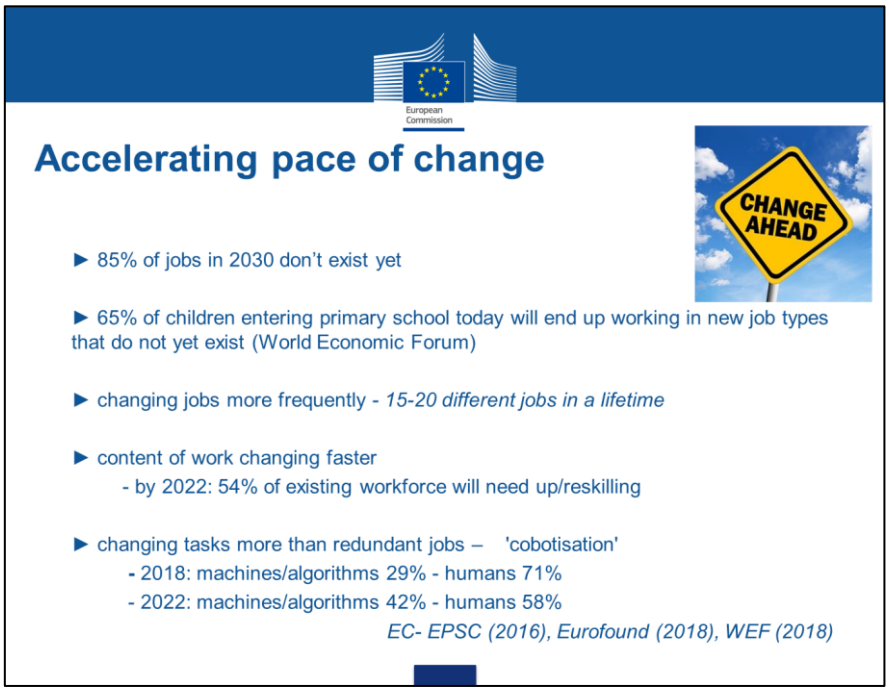
[4] *Cobotisation*: When human and robots cooperate for a more efficient production (www.lacroix-electronics.com)

[5] Eurofound (2019), The future of manufacturing in Europe, Publications Office of the European Union, Luxembourg. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/fomeef18002en.pdf

[6] *Eurostat newsrelease 199/2018 – 20 December 2018, Internet use in the EU, 2018 – digitalisation at work, https://ec.europa.eu/eurostat/web/digital-economy-and-society/overview*

[7] https://www.cedefop.europa.eu/en/events-and-projects/projects/skills-online-job-vacancies, based on information gathered from more than 30 million online job vacancies collected in the second half of 2018 in Czechia, Germany, Spain, France, Ireland, Italy and the UK (60 %of the EU worksforce)

Accelerating pace of change



Work on competence frameworks to support understanding of digital and entrepreneurial competences should be understood in a broader policy context, and in the context of shifting labour market trends and education and training systems. Automation and other new and emerging technologies have the potential for disruptive change creating both risks and opportunities, which we must be prepared for. Political and economic actors, at all levels, are reacting to the future of work. The trends are clear[8] and bring many open questions, but one consistent response is the need for uniquely human transversal skills and ongoing support to ensure a workforce with relevant skills.

Recent jobs and skills demand based on big data analysis of real time labour market intelligence

After several years of development, Cedefop[9] has presented first results from its real-time labour market information project in March 2019. This new type of labour market intelligence is based on information gathered from more than 30 million online job vacancies collected in the second half of 2018 in Czechia, Germany, Spain, France, Ireland, Italy and the UK (60 % of the EU workforce). The classification of European skills, competences, qualification and occupations (ESCO) and

[8] The next era of human machine partnerships (https://www.delltechnologies.com/content/dam/delltechnologies/assets/perspectives/2030/pdf/SR1940_IFTFforDellTechnologies_Human-Machine_070517_readerhigh-res.pdf); The Future of Skills and Jobs (http://reports.weforum.org/future-of-jobs-2016/chapter-1-the-future-of-jobs-and-skills/); Multiple Generations at Work (http://futureworkplace.com/wp-content/uploads/MultipleGenAtWork_infographic.pdf); The Future of Work? Work of the Future (https://ec.europa.eu/epsc/publications/other-publications/future-work-work-future_en); Automation, digitsation and platforms: Implications for work and employment (https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef18002en.pdf).

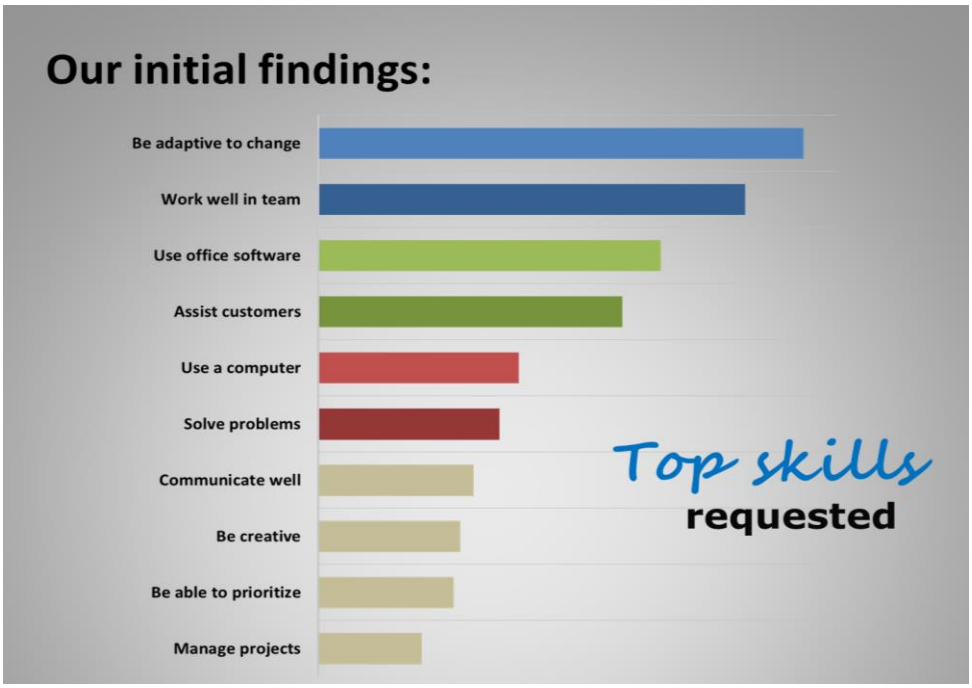
[9] https://www.cedefop.europa.eu/en/events-and-projects/projects/skills-online-job-vacancies

complex big data analysis techniques were used to extract information on skills from the vacancies. The results are presented in the Skills Online Vacancy Analysis Tool for Europe (Skills OVATE).[10]

Skills OVATE complements Cedefop's toolkit of already well-established sources of labour market intelligence, such as the European skills forecast, the European skills index, and the European skills and jobs survey. These sources are used by policy makers at EU and Member State level to inform education and training and employment policies – they help countries in keeping their education and training systems in sync with rapid changes in the world of work.

Early results have been released in March 2019, and the fully operational system, working across all EU Member States, will be available by the end of 2020.

Preliminary findings on top skills demand are illustrated below.



European policy responses

The **Skills Agenda for Europe** aims to improve the quality and relevance of training and other ways of acquiring skills, make skills more visible and comparable and improve information and understanding of skills intelligence to enable people make better career choices, find quality jobs and improve their life chances. The agenda actions require collaboration across sectors, to support transitions between the worlds of education and training and employment and ensure development of expertise, information, supports and tools to support these objectives.

[10] https://www.cedefop.europa.eu/en/data-visualisations/skills-online-vacancies

In the implementation of the Skills Agenda, the EC has put forward ten key actions in three priority areas:

- Improving the skills quality and relevance across Europe – to improve the matching between skills demand and skills supply in an ever faster evolving labour market
    1. Upskilling pathways
    2. Key Competence Frameworks
    3. VET as a first choice
    4. Digital Skills and Jobs Coalition
- Making skills and qualifications more visible and comparable – this facilitates mobility from areas where there is surplus demand of certain skills to those where there is a gap
    5. Revision of EQF
    6. Skills profile tool for 3rd country nationals
- Improving skills intelligence and information for better career choices.
    7. Revision of EUROPASS
    8. Analysis of brain flows
    9. Blueprint for sectoral cooperation on skills
    10. Initiative on graduate tracking

In this context, it is important that DigComp and EntreComp are considered under the three priority areas.

1.2 DigComp and EntreComp, European Key Competence Frameworks

In support of the development of digital competence among European citizens and in support of the 2nd priority area of the Digital Education Plan[11] "*Developing relevant digital competences and skills for the digital transformation*", the EC developed the Digital Competence Framework for Citizens,[12,13] also known as **DigComp**, which defines what competences are needed to become digitally competent. It offers a guidance to improve citizens' digital competence. First published in 2013, DigComp has become a reference for the development and strategic planning of digital competence initiatives both at European and at Member State level.

The DigComp Framework has 5 dimensions: 1: Competence areas identified to be part of digital competence; 2: Competence descriptors and titles that are pertinent to each area; 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.

The 5 Competence areas are: 1. Information and data literacy, 2. Communication and collaboration, 3. Digital content creation, 4. Safety, 5. Problem solving. These 5 areas are articulated into a total of 21 competences.

EntreComp[14,15], the European Entrepreneurship Competence Framework launched in 2016, is a comprehensive, flexible and multi-purpose reference framework designed to help understand what is meant by entrepreneurship as a key competence for lifelong learning. It is intended to support and inspire actions to improve the entrepreneurial capacity of European citizens and organisations.

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[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:22:FIN

[12] *More information on: https://ec.europa.eu/jrc/en/digcomp*

[13] *video at: https://ec.europa.eu/social/main.jsp?catId=1315&langId=en&furtherVideos=yes*

[14] *More information on: https://ec.europa.eu/jrc/en/entrecomp*

[15] *See presentation video at: https://ec.europa.eu/social/main.jsp?catId=1317&langId=en*

EntreComp creates a shared understanding of the knowledge, skills and attitudes that make up what it means to be entrepreneurial – discovering and acting upon opportunities and ideas, and transforming them into social, cultural, or financial value or others. It is made up of 3 competence areas: 'Ideas and opportunities', 'Resources' and 'Into action'. Each area includes 5 competences, which, together, are the building blocks of entrepreneurship as a competence. The framework develops the 15 competences along an 8-level progression model. Also, it provides a comprehensive list of 442 learning outcomes, which offers inspiration and insight for those designing interventions from different educational contexts and domains of application.

The EC has also produced "**DigComp into Action**" and "**EntreComp into Action**" guides for use by stakeholders in different contexts.

The Skills Agenda communication recognises that within its implementation, it is needed "*to support further development and implementation of the frameworks".*

1.3 Research context and objectives

The European Commission - DG Employment and Social Affairs in cooperation with the Joint Research Centre B4 Human Capital and Employment Unit -, has carried out research with the objectives to understand which policy options could, in a practical and effective way support Labour Market Intermediaries active in the digital skills assessment, up-skilling and skill matching processes for employability, and encourage the use of the DigComp as a supporting tool.[16]

While DigComp, the European Digital Competence Framework for Citizens, offers a key starting point for understanding and developing digital competences, its use in different settings needs to be explored and strengthened so that people see the value of using the tool within larger processes around identifying skills needs and responses. A key case is for employees and job-seekers, who may not have experience or confidence with their digital skills yet the nature of their jobs, the sectors they work in and their lives are increasingly influenced by digitalisation. Targeted, relevant systems and responses are needed to offer digital skills development opportunities to individuals.

The research has the objective to understand which policy options could, in a practical and effective way, encourage the use of DigComp by labour market intermediaries in the (digital) skills assessment, up-skilling and matching processes.

Labour market intermediaries (LMI) are understood in a broad sense, including those actors working towards the development of skills of unemployed, jobseekers, employees and entrepreneurs(-to-be) with the aim of increasing their employability (defined as preparing for, finding, retaining and progressing in work), and actively contributing to better matching the skills needs and supply in the labour market (both in the public and private sectors).

The following tasks were planned within the research project:

- Mapping DigComp use for employability
- Identifying priority use cases of DigComp for employment purposes

[16] This report is prepared in the context of the Administrative Agreement (AA) Nº JRC 34969-2017 between JRC, B.4 Unit and DG EMPL Directorate E Unit 2, Project: Support for development of digital and entrepreneurial competences (CompDev), WP B1: Linking DigComp to Employment Opportunities, as outlined in the Annex B Technical Specifications to the AA, and following the agreed research methodology and report contents as outlined in the Inception report agreed.

- Developing a DigComp Adoption Guide for use by stakeholders

This report is focussed on DigComp. A parallel research activity was also undertaken on the implementation of EntreComp, the European entrepreneurship competence framework. The complementarity of digital and entrepreneurial competences observed in practical cases suggested the relevance to research about the use of both competence frameworks, opening up the opportunity to identify messages across frameworks. These are also included in this report. The specific results for EntreComp framework are reported in a parallel report. [17]

At the time of the workshop, a draft report *B1.1 Mapping DigComp use for employability* had been prepared. The research has included a literature review to characterise labour market intermediaries active in skilling processes for employability and the functions they carry out in this context. A second research has carried out an analysis on how a selection of actors (in 9 cases) make use of the DigComp Framework for digital competence development for employability, across the services they provide, including: operational aspects, enabling and key success factors, the benefits brought by the framework, challenges and gaps encountered in its implementation, and a reflection on possible research and policy options to address the latter.

Guided by the preliminary research results, a stakeholders´ consultation workshop has been organised with the aim to validate research results and identify and integrate stakeholders´ views on specific areas, as described in the below section *1.4*. The results of the workshop reported in this document will contribute to addressing the 3 tasks mentioned earlier and the overall project objectives.

1.4 Aim of the workshop

The aim of the workshop was to provide useful input for upcoming European policy developments in the field. More in detail, it aimed to:

1. Present the major findings of the project
2. Debate key research and policy options to address the challenges identified by labour market intermediaries in relation to DigComp implementation in their digital (up-) skilling activities
3. Debate new avenues to engage and support stakeholders and enterprises in their (up-) skilling role in the area of digital competences such as:
   - Effective awareness raising and engaging actions among labour market intermediaries and enterprises
   - Discussing priority sectors, occupations and profiles for digital upskilling actions
   - Bundling digital skills with other skills needed by the labour market
   - Developing supporting material for stakeholders
   - Promoting or building communities of practice.

[17] *Bacigalupo et al. (2019) Mapping EntreComp use for employability. Forthcoming.*

1.5 Report content

Following the present introduction, the remainder of the report is organised along the following chapters:

- Chapter 2 presents the key research results and the debate that took place on those.
- Chapter 3 presents the results of the different thematic consultations run during the workshop:
  - Consultation on needs for support material: users, content and purpose
  - Consultation on needs for a Community of Practice
  - Panel discussion 1: Effective awareness raising and engaging actions towards stakeholders
  - Panel discussion 2: Priority sectors, occupations and profiles for digital skilling actions
  - Panel discussion 3: Bundling digital skills with other skills needed by the labour market.
- Chapter 4 aims at providing inspiration for future digital skills development ecosystems, from two examples of Basque organisations: Ikanos project and Aernnova.
- Chapter 5, presents final conclusions of the workshop.

The workshop Agenda and participants to the workshop are included in Annexes 1 and 2 to this document.

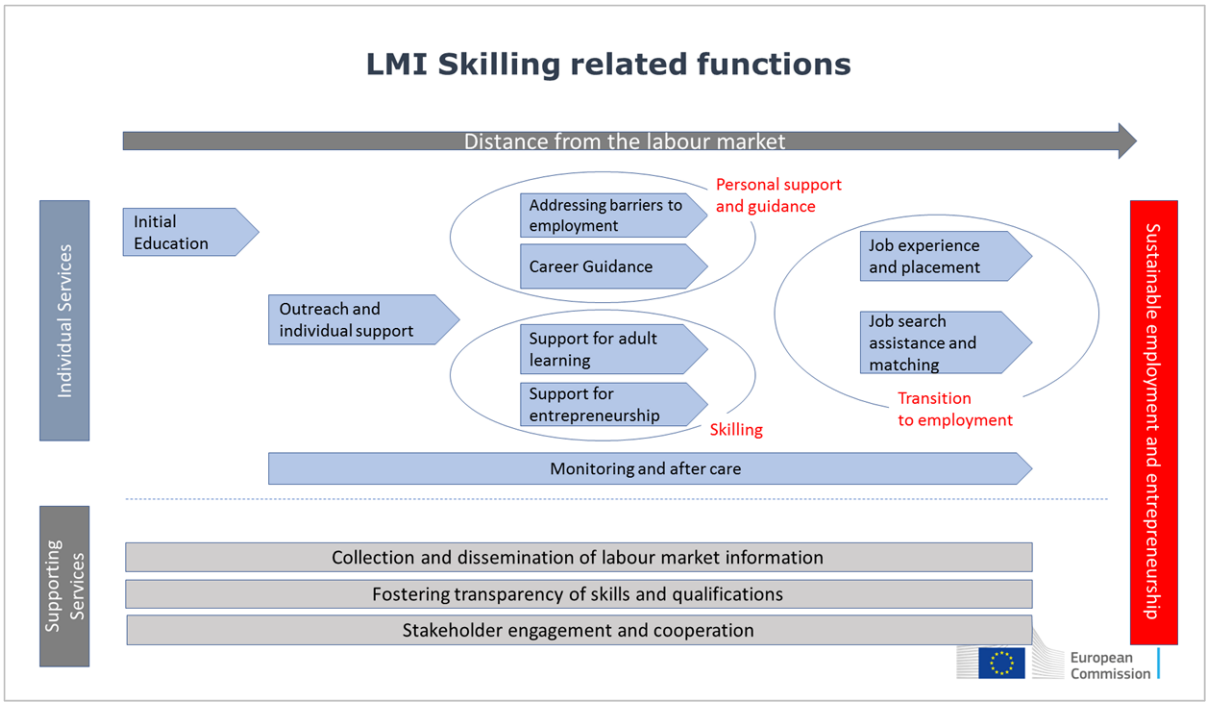
In Annex 3 are summarized the method used and the detailed results of the research and policy prioritisation exercises.

2. Presentation and debate of key research results

2.1 Key research results – Case analysis of DigComp use

A case analysis was carried out with the aim to learn from the experience of those actors using DigComp and EntreComp which provide a significant or relevant set of functions along the employability path. A reference employability path, illustrated in the below Figure 1, has been used for the research which outlines the major functions that labour market intermediaries carry out in their task to develop individual skills to increase their employability.

***Figure 1**. LMI skilling related functions across the employability path*



An inventory of 27 cases of actors using DigComp providing services for digital (up-) skilling from across the employability path was drawn up, and 9 cases for in-depth analysis[18] were selected based on the level and range of the use and application of the frameworks across the employability path. The **cases selected** for further analysis sought to ensure diversity in terms of:

- public, private and third sector LMI actors
- interventions relevant across the breadth of the employability path
- target groups/beneficiaries of the services
- multi-stakeholder cooperation models
- geographic diversity - from a wide range of countries across the EU (and beyond if possible)
- reaching a wide range of target groups
- level of maturity

The 9 in-depth case studies were developed by interviewing one or more representatives of the organisations / projects involved (using an open question check list in direct or online interviews and

[18] *For a detailed analysis of each of the cases, see Report: DigComp into Action – Vol 2. DigComp atWork (forthcoming)*

e-mail exchanges) and by analysing documentation, project web sites, online services and other relevant materials provided by the interviewees. A map illustrating the country of the leading organisation is presented in Figure 2 and the location of all organisations included in the DigComp study in Figure 3 below.

***Figure 2**. Location of DigComp (blue) and EntreComp (green) cases' lead organisations included in the study*

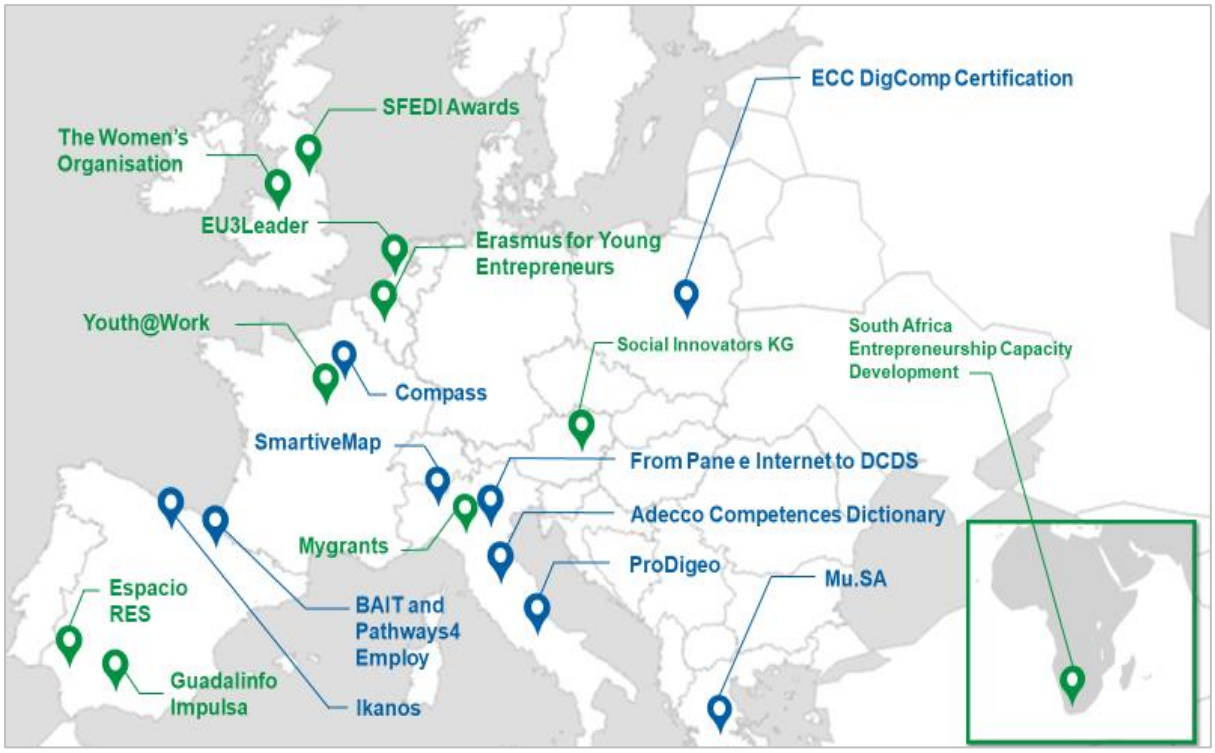


***Figure 3**. Location of DigComp lead organisations included in the study*

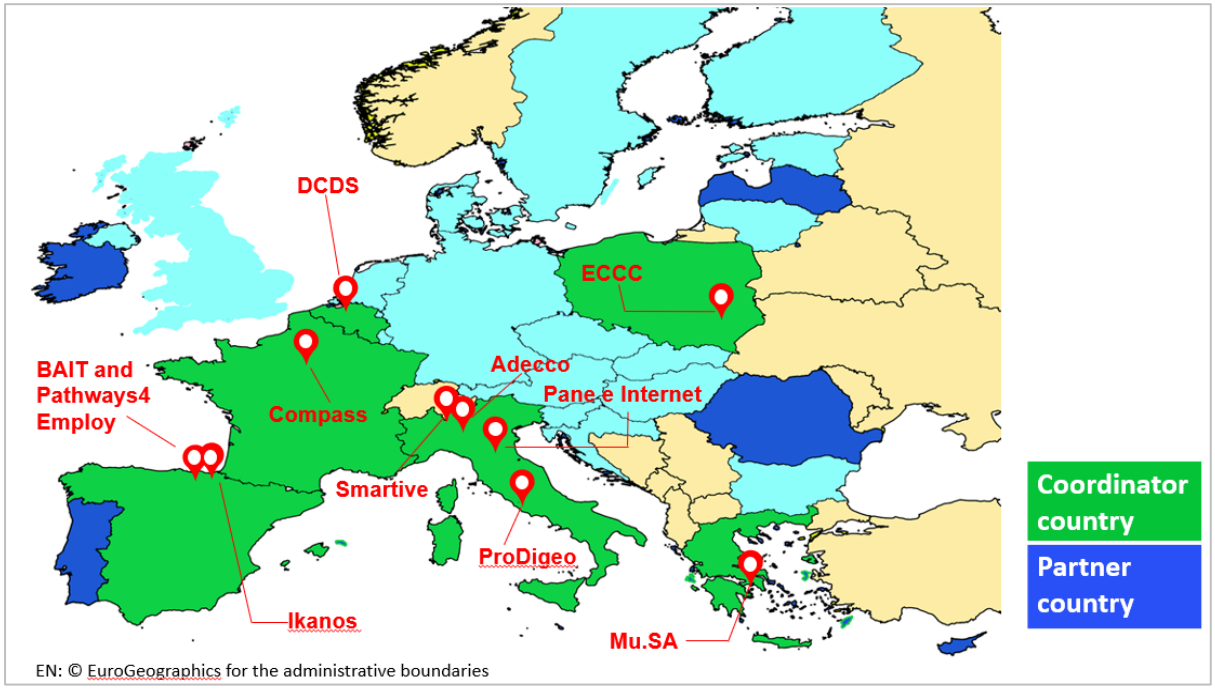


Table 1 below lists the Cases included in the analysis in alphabetical order of the lead organisation.

Table 1: *DigComp Case Studies*

Case study	Sector	Country
DIGCOMP 01. From Pane e Internet to the DCDS project *AECA*, the main association of VET organisations in Emilia Romagna, has implemented the Pane e Internet digital literacy project, the 3i informatics courses for unemployed people and is now in charge of the Digital Competence Development System project's methodology. All these initiatives base the design of their training offer on DigComp.	Third Sector	Belgium Greece Italy Latvia Romania Spain
DIGCOMP 02. ProDigeo *Anpal Servizi*, the operational arm of Anpal (Italian National agency for active employment policies), has developed the ProdiGeo eLearning platform and the Prodigeo course on digital competence for staff of public (Centri per l'impiego) and private employment offices. The course 10 modules were designed using DigComp.	Public sector	Italy
DIGCOMP 03. Ikanos project The *Basque Country Government* launched in 2012 the Ikanos project to create a learning support infrastructure for the digital competence needs of citizens, enterprises, civil servants and others. Ikanos used DigComp to design a self-assessment test (linked to career and training guidance) and various tools and services to develop digital competence for employability, including industry 4.0 job profiles.	Public sector	Spain
DIGCOMP 04. ECCC DigComp certification *ECCC Foundation* was established in 2009 to promote its newly designed European Computer Competence Certificate. In 2016, ECCC foundation modified its certification system with the addition of a DigComp area (validated in about 80 accredited examination centres) and set up a DigComp National Contact Point and a coherent training offer.	Third Sector	Poland
DIGCOMP 05. Compass project *Expertise France*, the French public agency for international technical assistance, coordinated the development of an up-skilling online training course for young unemployed people. The Compass platform offers a self-assessment tool and 18 lessons addressing 9 - DigComp competences in four occupation areas: teaching; business & administration; legal, social and cultural professions; general and keyboard clerks.	Public sector	France Ireland Italy Romania
DIGCOMP 06. MuSA project *Hellenic Open University* coordinates the MuSA: Museum Sector Alliance project. This developed work profiles and an articulated training offer, based on the integration of DigComp and e-CF competences, for four new ICT-related job profiles in museums: digital strategy manager, digital collections curator, digital interactive experience developer, and online community manager.	Public sector	Belgium Greece Italy Portugal
DIGCOMP 07. SmartiveMap *Smartive*, a start-up in Milan, developed SmartiveMap, a self-assessment tool to analyse digital transformation readiness of individuals and organisations, based on their openness to change and digital skills. Assessment questions on digital	Private sector	Italy

competence are partly drawn from DigComp and partly identified by experts of the main business functions: purchasing, operations, finance and controlling, marketing & sales, human resources, ICT.		
DIGCOMP 08. BAIT and Pathways4Employ *Tecnalia*, Spain's largest private R&D entity, developed BAIT, the new digital competence certification system of Basque Country, fully based on DigComp and currently tested with IVAP (the Basque Institute of Public Administration) public employees. Tecnalia was also partner of the Pathways4Employ (P4E) project, which used DigComp to define the digital profiles of entrepreneurs and virtual office workers and developed a self-assessment test on related digital skills.	Private sector	Belgium Greece Ireland Latvia Spain
DIGCOMP 09. Adecco Competences Dictionary *Adecco Group Italia*, the largest private employment agency in Italy, is starting to use the new release of its (soft) Competences Dictionary which includes for the first time digital and entrepreneurial competences as defined by the DigComp and EntreComp frameworks. The Dictionary supports staff selection and assessment activities.	Private sector	Italy & global

A further 25 organisations have been consulted as part of this research project, with views and experiences captured through online surveys circulated and promoted through the research team's relevant networks.

Table 2: *Additional Contributors*

Additional organisations consulted through in-depth interviews:	Sector		Framework used
1. University College Leuven-Limburg	Public	Belgium	EntreComp DigComp
2. Valnalon	Public	Spain	EntreComp
3. Mindworks	Private	Georgia	EntreComp DigComp
4. SEECEL	Public	HR (lead), AL, MK, KO, ME, RS, TK, BA	EntreComp DigComp
5. Virke	Public	Norway	None
6. Cardiff Metropolitan University Department of Sport Science	Public	UK	EntreComp
7. Materahub / Break in the Desk	Third	Italy, UK, Finland, Hungary, Spain, France	EntreComp DigComp
8. Simply Do Ideas	Private	UK	EntreComp
On-line survey responses received from			
9. Talous ja nuoret TAT	Third	Finland	EntreComp DigComp
10. European Centre for Women and Technology (ECWT)	Third	Norway / EU	EntreComp DigComp
11. Queensland (QLD) innovation & entrepreneurial ecosystem	Public	Australia	EntreComp

12. Kemmy Business School, University of Limerick	Public	Ireland	EntreComp
13. State University of Applied Sciences (PWSZ), Elbląg	Public	Poland	EntreComp
14. Tomorrow's Land, Regenerus (TL)	Third	UK	EntreComp
15. Advice Skills Academy (ASA)	Third	UK	EntreComp DigComp
16. PIETE, Univations GmbH	Private	Germany	EntreComp
Additional online feedback received from:			
17. Entrepreneur Academy	Private	Belgium	EntreComp
18. Asociacion Jovenes Solidarios	Third	Spain	EntreComp DigComp
19. 1st EPAL of Lerapetra	Public	Greece	EntreComp
20. Silesian University	Public	Czech Republic	EntreComp DigComp
21. Instituto Superiore Luigi Einaudi	Public	Italy	EntreComp DigComp
22. Hireable	Private	USA	EntreComp DigComp
23. AUPEX	Public	Spain	DigComp
24. All Digital	Third	EU	EntreComp DigComp
25. European Grants International Academy	Public	Italy	EntreComp DigComp

2.2 Key research results - Cross case analysis

A cross case analysis has complemented the individual cases analysis. Specifically, the research has sought to provide:

- an analysis of actual and potential uses of the DigComp framework (and EntreComp), to address the digital and entrepreneurial skills challenge; to support LMIs working across the employability path in their processes and tasks
- an understanding of practical approaches of how to implement DigComp, including steps for personalisation, modification or extension of the framework, and a description of related complementary tools that can support their implementation
- an analysis of successful multi-stakeholder cooperation models
- an analysis of the enabling factors, drivers and conditions and key success factors for implementing DigComp in the employability context
- an analysis of the key challenges found while implementing the DigComp framework
- an initial proposal of research and policy options to support further implementation of DigComp and EntreComp in the employability context.

Mapping of DigComp cases along the LMI skilling functions

Table 3 illustrates the analysis of DIGCOMP 9 cases against the LMI skilling functions of the employability path, reflecting the breadth of services each provides. Collectively, the DigComp cases provide services in all set of skilling functions, with greatest prevalence (indicated in dark green) in:

- Training design / development (all 9 cases)
- Labour market skills analysis (8 of 9 cases)
- Delivery of training / development (7 of 9 cases)
- Assessment of skills (6 of 9 cases)
- Certification of competence (6 of 9 cases)

***Table 3**: DigComp cases analysis along selected LMI skilling related functions in the employability path (DC when DigComp is used, X when activity performed without using DigComp)*

LMI skilling related functions	DCDS / AECA PeI	ProDigeo / Anpal Servizi,	Ikanos / Basque	ECCC DigComp certification / ECC Foundation	Compass / Expert FR	MuSA / HOU	SmartiveMap	BAIT/P4E / Tecnalia	Adecco Competences Dictionary / Adecco Group Italia
Labour market skills analysis (including analysis of professional digital profiles)		DC	DC	DC	DC	DC	DC	DC	X
Outreach to under / unemployed	X		X		X				
Assessment of skills	DC		DC		DC		DC	DC	DC
Personal development plan			DC		DC			DC	X
Training design / development	DC	DC	DC	DC	DC	DC	X	DC	X
Delivery of training	DC	DC	DC		DC	DC	X		X
Career advice		X	DC		DC			DC	X
Client tracking and monitoring			X				X		X
Liaising with employers for job placement /experience						X			X
Job search / support		X							X
Employee support							X		X
Workforce development			DC				DC		X
Certification of competence	DC	DC		DC	DC	DC		DC	

Actual use of DigComp along LMI skilling functions

Table 4 below summarizes which steps of the employability path are addressed by the experiences of the DigComp case studies. While different cases may have actions across multiple steps in the

employability pathway, as seen in Table 3, they do not always use DigComp in each step. The table highlights that some steps are indeed addressed by leading actors of these experiences, but without making any direct use of DigComp. On the other hand, DigComp implementation is mostly concentrated in the following steps:

- labour market skills analysis, which in fact concerns the analysis of digital skills requirements of various occupations and the definition of related professional digital profiles;
- assessment of digital skills, which we shall discuss together with their certification;
- design, development and delivery of digital competence training offers.

It should be noticed that DigComp has also been used (or is currently being used) for development of a personal development plan and for career advice at individual level, and for workforce development at corporate level. These functions would normally follow the competence assessment. However, these two applications of DigComp are still in early stages, and not enough information nor evidence was available to analyse them and provide useful conclusions.

***Table 4**: Explicit use of DigComp per LMI function*

LMI function	DigComp use
Labour market skills analysis	Analysis of digital competence requirements in various occupations (ProDigeo, BAIT) Design of professional digital profiles (Ikanos, Compass, MuSA, Smartive, Pathways4Employ) Benchmarking services in business sectors (planned by Ikanos and Smartive) aiming at identifying skill requirements at organisational level and at comparing your skill level with organisation´s competitors.
Outreach to under/unemployed	This is done in some cases, but *without DigComp use*
Assessment of skills	Design of DigComp-based (self-)assessment tools (AECA-DCDS, Ikanos, Compass, SmartiveMap, Pathways4Employ). Adecco's new competence dictionary for assessment purposes includes DigComp competences
Personal development plan	DigComp used for further training and/or career advice/guidance by Ikanos (Orientation Guide and Personal Learning Environment). Compass and Pathway4Employ link self-assessment and training offer to specific occupational profiles
Design and delivery of training	DigComp use for training offers (AECA-Pei and AECA-DCDS, ProDigeo, Ikanos, ECCC, Compass, MuSA, BAIT)
Career advice	DigComp used for career advice/guidance by Ikanos (Orientation Guide and Personal Learning Environment). Compass and Pathway4Employ link self-assessment and training offer to specific careers
Liaising with employers for job placement/ experience	This is done in some cases, but *without DigComp use*
Job search / support	This is done in some cases, but *without DigComp use*
Employee support	This is done in some cases, but *without DigComp use*

Workforce development	Smartive "digital transformation journeys" address workforce competence development and are informed by DigComp-based skills assessments.
	Adecco-Mylia offers workforce development consultancy and training, but *does not rely directly on DigComp*
Certification of competence	Certification of DigComp competence or certification of course completion (AECA-DCDS, ProDigeo, ECCC, Compass, MuSA, BAIT)
Client tracking and monitoring	This is done in some cases, but *without DigComp use*

In the next sections the key learnings of DigComp use across the major functions are presented:

1. Analysis of competence requirements for occupations in the labour market
2. Assessment and certification of skills
3. Training design and delivery

The use of DigComp for the analysis of competence requirements and the definition of professional digital profiles

The distinctive use of DigComp by LMIs operating along the employability pathway is undoubtedly its contribution to the identification of the digital competences required today in professional activities, referred to with minor semantic nuances as jobs, job roles, professions or occupations.

In the DigComp case studies, **digital competence requirements for specific job profiles** have been analysed with respect to:

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

These analyses and the definition of **professional digital profiles** (PDPs) have addressed jobs in different organisations (from large companies to SMES, consultants and self-employees in general) and economic sectors: public administration and other public activities (e.g. in education and cultural sector); public and private employment services; the manufacturing industry, the cultural and creative industries.

In total 38 occupations have been analysed for their digital and soft skills requirements. In most cases, leading to the definition of PDPs[19], which identify which competences are needed and at which level, in order to carry out effectively and efficiently the selected occupations. The

[19] The PDP descriptions, when available, can be found in the case studies or online, at the links included in the report.

identification of the relevant digital competences of an occupation is also used to design training and/or assessment solutions, which take them into account.

If these profiles were used by many organisations in different countries and industries, to measure the strengths and weaknesses of their workforce, it would become possible to **benchmark** the situation of an organisation's human resources against the industry average / market leaders and so on. Ikanos and Smartive have started thinking about offering such a service.

Main challenges identified:

1) How to design PDPs in an effective and systematic way? There are no standardised guidelines for defining detailed competence requirements in those PDPs, hence stakeholders all develop their own different approaches, which require significant effort;
2) How to spread the adoption and increase the recognition of these profiles? This could be done for instance by integrating them within the ESCO *repertoire* of occupations. ESCO is the European multilingual classification of Skills, Competences, Qualifications and Occupations, which is much used for instance in the description of job positions and the aims of training offers.

The use of DigComp for assessment tests, recognition and certification of digital competence

Table 5 below shows that in all the case studies DigComp has been used for competence assessment and/or certification purposes.

Tests developed differ depending on the types of questions they use:

- **self-assessment** questions ask respondents how confident, strong etc. they feel with respect to some topic, activity etc., whether or how much they know and/or are able to do certain things, etc;
- **knowledge** questions are designed to check whether the respondent knows or not a given piece of knowledge, 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;
- **performance-based** tests require users to perform some task in order to give the requested answer or complete an assignment.

In most cases, tests are based on knowledge and self-assessment questions, as these are most manageable with fully online procedures and are quicker to deliver for self-assessment purposes. Performance based tests either require sophisticated simulations and other somewhat complex technical solutions (e.g. BAIT), or the direct observation and/or intervention of an evaluator (e.g. DCDS, ECCC for advanced level), and take longer to be executed. A self-perception test has been used in the DCDS project before the course, with the aim to gauge how strong or weak respondents felt (rather than measuring their initial competence), before recommending them to take the basic digital literacy course.

In most cases, the tests designed have standard features and address different (or all) DigComp competences and levels. Two case studies (Smartive and Ikanos) have developed assessment

systems which can be customized to reflect different occupational profiles and needs (e.g. the monitoring of competence development over time) of the organisations who use the test.[20]

***Table 5**: Competence assessment and certification in the DigComp case studies*

Case Study	Test type	Link with training	Output	Test publicly available
DIGCOMP 01. AECA DCDS project	Self-assessment + Knowledge questions Knowledge questions. + Performance based	Pre-course Post-course	Self-assessment test feedback Course + competence badge	(only test content, not tool)
DIGCOMP 02. Prodigeo project	Knowledge questions	Post-course	Course certificate	
DIGCOMP 03. Ikanos project	Self-assessment questions	No direct link	Personal profile	Yes
DIGCOMP 04. ECCC DigComp certification	Knowledge questions Performance-based (only advanced level)	No direct link	Competence certificate	
DIGCOMP 05. Compass project	Self-assessment questions Knowledge quest. + Performance based	Pre-course Post-course	Self-assessment test feedback Competence badge	Yes
DIGCOMP 06. MuSA project	Knowledge questions	Post-course	Course certificate + profile badge	
DIGCOMP 07. SmartiveMap	Knowledge questions	No direct link	Personal profile	Yes
DIGCOMP 08. BAIT	Knowledge questions + Performance based	Post-course	Competence certificate	
DIGCOMP 08. Pathways4Employ (P4E) project	Self-assessment questions + Performance based	No direct link	Competence + profile badge	Yes

Digital competence tests may be offered /taken for different aims and with different output.

[20] *In Compass, there is only a partial adaption to the different career paths of the project works required for the test at advanced competence level.*

Assessment tests at individual level:

- to get a personal digital competence profile (Ikanos, Smartive), that may then be used for individual (training or professional) guidance,
- to get a professional digital profile badge or certificate, as in the case of entrepreneurs and virtual office workers (P4E) and of new digital museum jobs (MuSA);[21]
- to assess participants' skills before starting a course (AECA DCDS, Compass) and for summative assessment purposes during a course, with the issuing of intermediate and final badges or certificates (AECA DCDS, ProDigeo, Compass, MuSA, BAIT). Depending on how the course and the assessment are organised, these credentials may refer to specific DigComp areas or competences and/or to course completion.

Assessment tests at corporate / sector level:

- to map employees' profiles, identify talents and potential digital champions in preparation for digital transformation initiatives in a company and to monitor improvements in ongoing transformation processes (Smartive).
- by aggregating a large number of test results, in order to plan training and learning activities to overcome competence gaps (Ikanos, Smartive);

Certification tests:

- to get a competence certification (ECCC, BAIT) for employability purposes, for career purposes (e.g. public employees) or other reasons (e.g. following a regulatory requirement as with EU-funded training projects in Poland).

The evaluation criteria (e.g. how many correct answers are required to pass a given test)[22] and other accreditation aspects (e.g. the use of e-portfolios to document learning achievements, as in Ikanos and Compass) vary across experiences, reflecting the target groups and aims of the initiatives, but also different orientations by those running them.

An interesting feature emerging from the case studies is the integration of assessment results in so-called "personal learning environments" and other solutions to support competence development in a life-long learning perspective.

Main challenges identified:

1. Methodological and organizational issues related to the assessment of competence, for example: the choice of on-site or on-line settings; the choice of which competence components (skills, knowledge and attitude) to be assessed and the most adequate methodologies to be used for each; how to integrate the importance of direct observation of behaviour in the assessment; the limitations of a feasible test duration vs. the need to assess the eight proficiency levels of DigComp 2.1 of the whole set (21) of competences, particularly critical for online self-assessment tests.

[21] *Compass, at the moment, does not issue career-path /occupation badges, but only the single competence badges related to each occupation.*

[22] *For instance, in Compass, the score is > 75%; in AECA DCDS is > 60%.*

2. The lack of common / established approaches to DigComp-based assessment and certification, leading to challenges related to the comparability and transportability of the results they produce.

The use of DigComp to design training offers

As mentioned before, almost all the case studies have used DigComp to design and deliver training on digital competence as illustrated in Table 6.

***Table 6**: Digital competence training in the DigComp case studies*

Case Study	Training design based on …
DIGCOMP 01. AECA PeI and DCDS	Comparison of existing training
DIGCOMP 01. AECA DCDS	Direct DigComp specification
DIGCOMP 02. ProDigeo	User needs analysis
DIGCOMP 04. ECCC	Direct DigComp specification
DIGCOMP 05. Compass project	Comparison of existing training / User needs analysis
DIGCOMP 06. MuSA project	User needs analysis
DIGCOMP 07. SmartiveMap	User needs analysis
DIGCOMP 08. BAIT	Comparison of existing training

The identification and/or design of training content for digital competence courses stem from different processes (which of course are always to some extent at play, but with varying intensity):

- building on existing training offer: the comparison of existing training offers with targeted/ desired DigComp competences highlighting gaps to be filled (BAIT with public administrative staff, Compass in the initial user needs analysis, AECA PeI in the revision of previous digital literacy courses);
- defining training content following DigComp specification of learning outcomes in view of given project goals (AECA DCDS design of foundation level training for all 21 DigComp competences) or certification aims (ECCC covering all DigComp competences at all proficiency levels);
- defining and developing new training content following job profile description and needs analysis: in-depth user needs analyses which identify training priorities and content in view of given professional digital profiles or development goals defined in terms of DigComp (and possibly other) competences (ProDigeo, MuSA, Compass, Smartive).

As mentioned before, courses may be structured to reflect either directly (ProDigeo, Compass, MuSA, BAIT, ECCC) or indirectly (AECA DCDS and PeI) DigComp areas and competences.

Main challenges identified:

1. Mapping training offers to DigComp areas and competences is done by various actors without explicit guidance on how to do this, and thus, without common criteria that would enable comparability and reusability of training offers in terms of competence areas, competences and proficiency level descriptors.

2. When this was done in the experiences studied, the process was always somehow laborious, as it required looking carefully at existing course content and finding a correspondence with DigComp.
3. Because of different interpretations/specifications of DigComp competence descriptors, courses and training materials based on them may also have to be thoroughly examined to understand their content for potential reuse, comparisons etc.

Stakeholders involvement

(Local) governance of strategies to improve employability of unemployed people matters. In particular, the inclusion of employers, trade unions and other stakeholders in the planning of service provision for job seekers, while allowing for the tailoring of employability services to reflect the dynamics of local labour markets, are important foundations for success. Successful partnership-based approaches to tackling employability need a clear strategic focus based on a necessity for inter-agency cooperation and institutional arrangements that allow for shared ownership, trust and flexibility in resource sharing.[23]

These strategic cooperation approaches have been observed in the DigComp cases analysed. Table 7 illustrates the range of stakeholders engaged in DigComp implementations and the type of relationships with them by those leading the activities.

***Table 7**: Stakeholders involved in the DigComp case studies experiences (in bold the leading organisation)*

Case Study	Stakeholders type (in bold the leading organisation)	Type of relationship
DIGCOMP 01. AECA PeI -DCDS	**Training NGO (association of VET providers for PeI)** **European NGO (association of digital competence centres for DCDS)** Public administrations Educational experts VET providers Public employment agencies	Institutional collaboration Project-driven
DIGCOMP 02. ProDigeo	**Ministry of Labour and Social Policy** Public and private employment agencies Educational experts	Institutional collaboration within which project-driven collaborations take place
DIGCOMP 03. Ikanos project	**Regional Government** Public administrations University Educational experts Companies	Institutional collaboration Continuous dialogue Ikanos practitioner community

[23] *Green A E, de Hoyos M, Barnes S-A, Owen D, Baldauf B and Behle H. Literature Review on Employability, Inclusion and ICT, Report 1: The Concept of Employability with a Specific Focus on Young People, Older Workers and Migrants. Centeno C, Stewart J (Eds.). JRC Technical Report Series, EUR 25794 EN. Institute for Prospective Technological Studies, Joint Research Centre, European Commission (2013). Available at: http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6059;*

	Public and private employment agencies	
DIGCOMP 04. ECCC DigComp certification	**Research and development NGO** University Educational organisations Public administrations Companies Labour offices	Continuous dialogue
DIGCOMP 05.Compass project	**Public agency for international assistance** Educational organisations Employers Labour market actors	Project-driven
DIGCOMP 06. MuSA project	**University** Museum and culture sector professionals Museum and culture sector organisations Public administrations VET providers Third sector organisations Companies University	Project-related (prolonged through different projects)
DIGCOMP 07. SmartiveMap	**Private company (service provider)** Companies Business function managers and specialists Business consultants	Continuous dialogue SmartiveMap editors
DIGCOMP 08. BAIT	**Private research foundation** University Public administrations	Institutional collaboration
DIGCOMP 08. P4E	**Third sector organisations** Companies Free-lance professionals	Project-driven
DIGCOMP 09. Adecco Competences Dictionary	**Private Companies (employment services)** Educational organisations University	Continuous dialogue

The DigComp case studies clearly show that the activities needed to implement the framework, i.e. to customize and specify it operationally for each local context (language, sector, job profile, target group etc.) and for different purposes/steps (identification of professional digital competence, assessment, training design and delivery, competence evaluation and certification) require the participation of diverse and usually multiple stakeholders. The lists in Table 7 are inevitably partial

and they do not include end-users and/or their representatives which are of course part of the implementation experiences.

Table 7 shows that different types of multi-stakeholder relationships are developed: **institutional collaborations, project-driven** co-operation or establish a **continuous dialogue** with stakeholders. Finally, Ikanos and Smartive also share a very interesting and unique (among the current case studies) emerging cooperation model, relying on a sort of **community of practice.**

The case studies also show that DigComp implementation processes entail a shared learning process among those involved, starting from a reflection about digital competence and some degree of understanding of the DigComp framework (and possibly other frameworks used in the process). This fact together with the required participation of multiple stakeholders, result in a relevant investment of resources.

Key drivers for and benefits of DigComp use

The key factors mentioned in the case studies which motivated DigComp adoption and contributed to its successful implementation can be summarized as follows:

- the **new view** of digital competence brought by DigComp, which goes beyond the mastery of IT tools and takes fully into account the "soft" component of digital skills for effective information search, online communication and collaboration, and so on. This broader and "softer" view of digital competence is considered appropriate and needed to address the current challenges brought by the digital transformation, which sooner or later affects everyone.
- Part of this new view is also the "**completeness**" of the Framework, i.e. the fact that it covers a very comprehensive range of digital competence needs;
- the **flexibility** of the Framework, which is open to adaptation and specification to different contexts and needs. The possibility to combine/complement DigComp with other frameworks and other views of digital competence is part of this openness;
- the **clear and solid structure** of the Framework, which facilitates its communication and understanding, and its coherent implementation into areas/paths etc. and sub-levels (competences, modules, units etc.). Competence descriptions and examples are part of this clarity feature and also facilitate implementation;
- the Framework **neutrality** with respect to technological solutions[24] and to country features, which contributes to DigComp flexibility and usefulness particularly in international projects, but also in implementations at country or regional level which span across diverse techno-organisational settings (e.g. the network on public employment services in Italy);
- last but not least, **the credibility and reliability of the Framework** stemming from its EU origin and endorsement, as well as sound scientific basis in combination with stakeholders' consensus building.

[24] *As stated by ECCC Foundation tool-specific certificates become rapidly obsolete, whereas DigComp certificates are more durable.*

The most frequently mentioned positive contribution of DigComp adoption is undoubtedly to **creating a common understanding/language** to talk about digital competence among those involved in its implementation process. This is reported:

- in user needs analysis and consultation processes involving different stakeholders (Compass, P4E and MuSA);
- in change processes within companies, which need to develop a common view across technology, business and people management functions to address the digital transformation (Smartive);
- in the dialogue and consultancy services with customers (Smartive, Adecco,[25] Ikanos);
- in transnational projects involving diverse partners (AECA-DCDS, Compass, P4E, MuSA);
- in the dialogue among public administrations (BAIT in Spain about digital competence certification approaches).

This widely acknowledged feature of DigComp is essential to achieve broader, **systemic approaches and developments** and related transformation effects at full organisational or even societal level, as it enables the creation of "interoperability" conditions that are a pre-requisite for those effects to take place.

Key enablers to effective implementation

In the light of the above considerations, the key enablers of effective DigComp implementations seem to be:

- **continuous** (as real change takes time) **high-level support and commitment** to digital competence development within broader digital transformation initiatives, which should provide a strategic perspective and incorporate change management solutions;[26]
- **access to cumulated DigComp knowledge** built through implementation experiences. Such pools of DigComp expertise are currently growing de facto within a few organisations in some countries which have been able to create continuity in carrying out DigComp-related activities through local public and/or European project funding and/or through successful business service relationships;
- **awareness and information** initiatives about the meaning and importance of digital competence for employability and the business world where DigComp is not well-known. According to an interviewee, such actions should increasingly take the character of marketing campaigns which sell convincing evidence and messages about the benefits of digital competence for workers, self-entrepreneurs and enterprises alike.

[25] *Adecco's Competences Dictionary (which recently incorporated digital competence) was created to promote a mapping of professional roles that would include both technical and behavioural aspects, and to provide customers with an objective, uniform tool, that could be used/shared with them during an interview or a dialogue, as a shared reference model for the definition of each job".*

[26] *Quoting from the SmartiveMap case study "work on the development of digital competence (both general and functional) in a company must be part of a broader change process in order to be effective and produce impact: the operational opportunities must be created for people to put into practice, hence consolidate their newly acquired competence".*

Key challenges

In addition to the already reported challenges for the use of DigComp, additional challenges have been reported in DigComp implementations.

Adding more competences to DigComp to reflect the evolution of the digital world or making new issues more explicit

Several DigComp implementers faced the need to include additional competences which were not present in the Framework and could not be easily fitted into it. This was the case for Smartive with functional competences, Ikanos with sub-competences and MuSA with complementary e-CF and other new competences. The perception is that this need is going to grow, because of emerging innovations that are spreading also in the workplace but are not included in DigComp's implicit view of the digital world.

Concrete examples are provided by the ProDigeo case on how they incorporated the impact of artificial intelligence (AI) competence, by the MUSA case about how to integrate the impact of a new world dominated by smartphones and other mobile devices, emerging smart environments, intelligent interfaces, 3D modelling, Internet of things, artificial intelligence etc. It would be good to make more explicit how existing DigComp competences relate to new technological developments or actual issues such as "open innovation" and "fake news", the latter being easily grasped under area 1 of DigComp.

No conclusive answers are provided by the cases studies about how to deal with these issues, at least with a common approach.

Tackling arbitrariness of DigComp implementations Official translations of DigComp in all EU languages would certainly help stakeholders in addressing language translation challenges. Besides this, we have seen that when implementers move from the general/abstract DigComp descriptions to operational specifications, they make potentially divergent choices, leading to different interpretations and to the design of possibly incomparable assessment tests, training courses and so on. If this risk is not minimized or compensated somehow, "people think they are speaking the same language, but in reality, they are not". This is an inherent difficulty of the implementation of a reference Framework such as DigComp. Nevertheless, implementers assess it as critical. A request put forward to mitigate this problem is to clearly identify and describe a few core features -i.e. "mandatory" knowledge, skills, attitudes or learning outcomes- for each DigComp competence and proficiency level (at least on the 3-level scale).

Dealing with detailed DigComp proficiency levels and the "flatness" of the framework

Along with the appreciation of the conceptual view behind DigComp v2.1 and other considerations,[27] most implementers highlighted difficulties in managing the new DigComp 8-level proficiency scale, especially for assessment and training design purposes, and in communication

[27] *For instance, Smartive likes that DigComp higher levels highlight the proactive role that an advanced user can play to engage and support colleagues with low digital competence, which is an important lever to spread digital competence within an organization. ECCC Foundation's original certification system is based on 4 proficiency levels, and they had troubles adapting DigComp v1 to it, whereas the 8-level scale is more compatible.*

with end users. Some implementers did not know how to translate operationally the nuances of the two levels in which the basic, middle and advanced levels are divided, with difficulties to understand which are the real measurable differences between two adjacent levels and when/how does the transition from one to the next occurs.

Another issue which emerges in the design of training activities stems from the fact the DigComp is structurally "flat", with all competences having the same status and implicitly suggesting similar relevance in a learning process. For instance, "browsing and searching online" is at the same level as "programming", but the knowledge and skills involved in these two areas have a different complexity, especially when seen from an adult education perspective. DigComp implementers have managed this difficulty in school education, and had to decide which topics had to be addressed with students at which school level.[28] This also needs to be addressed for adult education.

Lack of awareness and understanding of digital competence by companies and other labour market actors

We have already reported the low awareness and understanding of digital competence and of the DigComp Framework among labour market stakeholders consulted, involved in different employability and skills development processes. This seems to be even more acute among companies and employers´ human resources (HR) departments in particular. Those organisations providing services to companies (Adecco and especially Mylia and Smartive) confirm the need for business support in this area.

In this context, there is a particular situation, which makes the picture more complex. HR personnel, as they never had to deal with this before, seldom have a clear idea of what is digital competence, which type and level of digital competence the company needs and how to develop it. On the other hand, IT departments who were traditionally in charge of this, tend to see and cater only for the technical side of digital competence, that is, they provide training and support to guarantee that employees can use the digital tools and procedures they need to work and overlook softer and more transversal digital skills and cultural aspects. Managers in charge of business development, in turn, may understand how new digital opportunities can contribute to company growth through innovation and greater efficiency, but they do not know much about the specific technology and people choices to be made in order to achieve that.

The issues just discussed can be linked to or aggravated by the resistance to change noticed in organisations, both private and public alike. A clear, strong and continuous high-level commitment within organisations, and adequate change management strategies, appear as key ingredients to develop employees' digital competence and create the conditions for it to have a wider transformative impact.

[28] See for instance, the Students Competence Framework by the Slovenian Education Institute in DigComp Into Action! Guide, T15, p.138.

2.3 Debate of key research results

The research results were well received and the conclusions endorsed by stakeholders who participated to the Bilbao workshop. Some debate took place developing on specific challenging themes in relation to DigComp adoption in employability settings.

DigComp adoption drivers by companies

Stakeholders that are providing services to companies raised an interest of their customers to have a **benchmarking service** on digital competences allowing comparing themselves with other actors in the same sector. From experience, this information seems more mobilising towards digital competence development actions than the understanding of the mismatch of staff digital competences compared to their job profiles.

Impact on staff and business competitiveness of digital competence development and the **cost savings** benefits of modular learning are also incentives for companies to adopt DigComp.

It was also mentioned that **company size** affects the attractiveness of a Framework such as DigComp for implementation, being higher for big companies than for smaller ones, as it helps to build consensus across a large organisation and the internal learning (or consultancy) investment requested is more manageable.

Another case for companies (to adopt DigComp to develop staff´s digital competences) is the role that digital competences play to develop **soft skills**, which are in increasing demand in the labour market. For example, communication skills or team working skills today are closely connected to and even depend upon digital competences such as those described in DigComp's Communication and collaboration area, although this contribution of DigComp for soft skills development may have not been made sufficiently explicit in the DigComp description.

Finally, the idea of **DigComp Ambassadors** addressing the human resources departments of employers (of both private and public sectors) is suggested to address the lack of awareness in the sector about DigComp and promote its use. Furthermore, more strategic thoughts on implementation support and tools may be needed if the goal would be to scale-up DigComp in the employment sector and achieve a systemic change / investment in digital competence development.

Underdeveloped potential of DigComp for job matching functions

A more specific angle of analysis is the potential use of DigComp for job-matching functions, currently underdeveloped.

A first pre-condition for DigComp use in this context is that both ends, supply and demand, i.e. job ads and training offers and related certificates would use the same vocabulary of DigComp, currently not happening. Second, public employment services do not always have the mandate to provide job-matching functions, and, even more, are required to work with national qualification frameworks, which usually make no reference to DigComp (also because they were defined before its publication), and aligning such frameworks to DigComp, seems a challenging task. Thirdly, in the private sector, job-matching services focus primarily on soft skills (vs. technical skills), which employers / recruiters find more difficult to assess and to train after employment. Finally, for those

employers with highly technical jobs, DigComp might be insufficient to describe in the job advertisements the complexity of skills required to the future employee.

A possible approach to address this challenge (assuming digital competences are developed within a more holistic project (or ecosystem) with a participation of different actors "speaking" the same DigComp language), could be the wider use of professional digital profiles. These offer a tool to facilitate job-matching services based on DigComp, as both training offers and job ads can be described along DigComp elements. This approach, however, would be limited to a number of PDPs, and would not provide a systematic solution for the whole set of national occupational standards.

About pedagogy

The way digital competence is taught can make a difference. Experience has shown that teaching digital competences together with other competences (for example social competences, creativity, entrepreneurship) and with a project-based approach (which normally entails identifying and achieving a goal of interest to the learners) is more effective in learning time and motivation than teaching digital competences alone. This raises the need for more evidence and good practices on pedagogical approaches that would enable to combine different competences and competence frameworks, such as DigComp and EntreComp.

2.4 Initial research and policy options

Initial research and policy options to support further implementation of DigComp in employability settings have emerged from the research of both DigComp and EntreComp use and are presented below. Many of those were relevant for both frameworks, and they are presented as such, for we believe it is relevant to raise awareness of the issues that emerge in relation to the definition and implementation of competence frameworks in general, given that several services at the EC are engaged in the development and implementation of Competence Frameworks for life-long learning.

Nevertheless, the primary focus of this chapter is on specific policy recommendations for DigComp implementation in the context of employability. We have thus cared to provide them separately.

The consultation method used, the participants that contributed, and the detailed results can be consulted in Annex 3.

2.4.1 Research Recommendations

We include in this section research recommendations in relation to the use of DigComp in employability settings. Many of those recommendations would, however, also support stakeholders engaged in digital competence development in other domains, such as education and training, life-long learning and inclusion.

R1. Clarify ambiguities and unclear aspects of DigComp	
	R1.1 Identify and/or propose mechanisms to drive use of progression or proficiency levels
	R1.2 Explore interdependencies and differences between competences
	R1.3 Resolve ambiguities in competence definitions (clarify competences)
R2. Investigate and provide guidance on how to co-develop DigComp and other competences and related Frameworks	
	R2.1 Interconnection among digital, entrepreneurial, soft and other key competences
	R2.2 Better understand links between competence and qualification frameworks
R3. Compare and identify approaches/tools on digital competence assessment for mutual recognition and reusability	
R4. Measure DigComp competence development impact in companies and other organisations (i.e. public services)	

2.4.2 Policy options

The two frameworks are well-regarded by all those contributing to this study. There is a strong feeling that they should be considered as flagship tools for the development of the key competence approach in Europe and to build the links into the labour market intermediaries involved in actions along the breadth of the employability pathway.

The first recommendations (section A) focus on specific policy actions that would support the implementation of DigComp in employability settings. These are complemented with additional

recommendations (sections B, C, D) which would contribute to the implementation of DigComp in general, some of which have already been reported in previous research.

A. Supporting DigComp implementation in employability settings	
	A.1 Strengthening the value of DigComp implementations for employability with a DigComp compliance "label"
	A.2 DigComp certification scheme
	A.3 Specific awareness raising campaigns among LMI
	A.4 Development of DigComp for enterprises
	A.5 Enhancing DigComp use in a professional perspective developing Professional Digital Profiles (PDPs) and linking them to ESCO
B. Awareness raising and increasing policy effectiveness	
	B.1 Targeting the right audiences
	B.2 Creating visibility through awards and presentations
	B.3 Develop communication support material
	B.4 Develop more synergies among/with EU policies and instruments
C. Support and promote knowledge sharing and co-operation among stakeholders	
	C.1 Build Expert steering groups for competence frameworks development
	C.2 Build a European Community of Practice
	C.3 Develop implementation support material
	C.4 Knowledge Centre (KC) for European Key Competences
D. DigComp governance and sustainability mechanisms	

2.5 Stakeholders´ feedback on initial research and policy options

2.5.1 Stakeholders´ feedback on research recommendations

The aim of the workshop consultation was twofold:
a) To identify possible missing research recommendations
b) To identify stakeholders´ priorities among those identified by research and stakeholders.[29]

Two new research priorities were proposed:

- R5. Good practices on co-working of DigComp and EntreComp and related training models
- R6. Methodological Guide to develop assessment tools

The prioritisation exercise provided the following results:

- The highest priority recommendation is *R4. Measure DigComp competence development impact in companies and other organisations* with 30%of the votes.
- Secondly, *R1. Clarify ambiguities and unclear aspects of DigComp* and *R2. Link of DigComp to other competences and frameworks* are interconnected, making 39,5% of the votes altogether. This would require conceptual work, revising and refining DigComp 2.1 and possibly addressing these into a new version, i.e. DigComp 2.2, and developing connections with other frameworks and competences required by the labour market.
- Thirdly, *R3. Compare and identify approaches/tools on digital competence assessment for mutual recognition and reusability*, received 18% of the total votes.

2.5.2 Stakeholders´ feedback on policy recommendations

The aim of the consultation was twofold:

a) To identify possible missing policy recommendations
b) To identify stakeholders´ priorities among those identified by research and stakeholders.

In relation to the description of the recommendations, the following comments were made:

- When referring to enterprises as employers, *other public and non-profit organisations* should be considered too (see A.4)
- The reference to a "label" or "stamp" (see A.1), should be done with care, as DigComp is not a standard but a reference framework and guide. Wording closer to "aligned with" would be more suitable. The visibility of the Framework would benefit, however, from a "label".

Two new policy recommendations were proposed:

B5. (In support of awareness raising actions) The creation of a *European Community of DigComp Ambassadors.*

E. Guide at EU/national level on how to implement DigComp connected to EU/National Qualification Frameworks, Occupational Standards and Education and Training Quality Standards

[29] Voting method: Each participant had 5 priority points to distribute freely among different recommendations. Participants provided their votes to items A.1 to A.5, B.1 to B.4, C.1 to C.4, D and E. For analysis purposes, results have been added-up for A, B. C and D.

The prioritisation exercise provided the following results:

- At the level of individual recommendations, *C.3 Develop implementation support material* received the highest number of votes (20%), and *A.5 Enhancing DigComp use in a professional perspective developing Professional Digital Profiles (PDPs) and linking them to ESCO,* received the second highest votes % with 13%.
- At the level of grouped recommendation, A to E, the recommendation group receiving highest number of votes was *A. Supporting DigComp implementation in employability settings* (with 38%) followed by *C. Support and promote knowledge sharing and co-operation among stakeholders* (with 30% of votes).

3. Specific thematic consultations

In this chapter are summarized the results of the different consultation processes that took place at the workshop.

3.1 The needs for support material: users, content and purpose

Background	*One of the top priority recommendations by stakeholders [see section 3.2 of this report] is to "Develop support material" or a "Guide". The assumption was that priority focus should be given to the three functions in the skilling process which DigComp supports most:* *1. Analysis of competence requirements and the definition of professional digital profiles,* *2. Design, development and delivery of the training offer, and,* *3. (self-) Assessment, recognition and certification of digital competence.*
Purpose	The aim of the working session was to further refine the specific needs for content, target groups, in which skilling functions or roles. A second aim was to clarify the related priorities among different options.
Questions	1. Which actors (LMI, enterprises, other) would benefit from the Guide and in the performance of which skilling function? 2. What supporting materials would be needed: which content and for what purpose? Which are the top priority materials to be developed? 3. Which expertise / people / roles should be involved in the development of the Guide?

Outcomes

The responses to Questions 1 and 2 have been integrated and structured along three types of support material in the below tables*: "How to" Guides, (Self-) Assessment, Evaluation and Certification Tools and Training material.*
In each table, the specific support material is outlined, the target users specified and for each combination of support material / target user, the purpose of use described. The top three priorities specified by stakeholders for support material are indicated on the tables.

"How to" Guides / Users / Purpose						
Guides / Users	Employers and Consultancy services organisations		LMI	Public Employment Services (PES), Career officer	Education and training (E&T) providers	Training course designers
	HR departments (Incl. NGOs)	*management*	*Digital Competence projects*			
Priority 1: DigComp adoption roadmap			All steps			

Develop and assess digital skills according to Professional Digital Profiles	Job profile and PDP definition, up-skilling employees		All steps	Career and training Advice and Guidance to users adapted to individual occupations	Develop course material	Design training courses
Priority 3: Impact analysis at company level of DigComp adoption		Self-evaluation, strategy definition				

(Self-)Assessment, Evaluation and Certification Tools / Users / Purpose						
Tools / Users	Individuals *Job seeker, self-employed, employed, unemployed*	Employers and Consultancy services organisations		PES, Career officer	Certification organisation	E&T providers
		HR departments (Incl. NGOs)	*management*			
Priority 2: Employee and company self-assessment tool with comparison by sector		Employee and organisation Self-assessment and benchmarking per sector	Skilling plan and strategy definition			
Individual self-assessment tool	Self-awareness			Career and training Advice and Guidance to users		Pupil assessment of skills prior to course
Training Guide based on self-assessment results	Training guidance	Advice and guidance to employees on career, training and up-skilling				
Standard assessment test for all competences and all levels	Certification of competences					
Criteria for delivering “stamps” or certificates					Certificate delivery	

Training material / Users / Purpose				
Training material / Users	Individuals *Job seeker, self-employed, employed, unemployed*	PES, Career officer	E&T providers	Training course designers
Open license training courses			Prepare course material	
Online training materials, including project based learning examples	Self-study to upgrade digital competence			Course design
Priority 3[30]: One-stop-shop information portal on education, training and employment	Increase career management skills, Obtain career and training Guidance	Information provision, career and training Advice and Guidance to users		

The response to Question 3, provided a broad set of actors to be involved in the production of the support material, with different roles as illustrated in the below table. Although not all participation roles have been specified for each actor, the results show the need for a broad participation of different stakeholders and experts.

Actors / Role		Participate in Focus groups	Analyse competence requirements & gaps	Develop ment	Pilot	Provide feedback
STAKEHOLDERS	Employers (by sector)					X
	Individual users *(28 EU MS)*	X	X	X	X	X
	LMI					X
	Guidance experts	X	X	X	X	X
	Training designers			X	X	X
	E&T providers			X	X	X
	DigComp Researchers	X	X			
	DigComp users *(private, public and 3rd sector)*			X	X	X
	DigComp future users					
	Actors interested in digital skills development					

[30] Note: Two items resulted as Priority 3, as they received similar number of votes.

EXPERTS	Digital experts			X	X	X
	DigComp implementation experts (researchers and stakeholders)					
	Communication experts					
	Educational actors, Pedagogy experts					X

3.2 The needs for a Community of Practice

Background	*One of the top priority recommendations by stakeholders [see section 3.2 of this report] is to build a European Community of Practice around DigComp.*
Purpose	The aim of this working session was to clarify how to address the future development of a DIGCOMP Community of Practice (CoP).
Questions	1. What should be the purpose of the CoP? 2. What kind of actors should be part of this community, i.e. which user profiles should be part of the CoP? 3. How should the CoP be governed? 4. Which tools would the CoP need to operate effectively

Outcomes

Input to the discussion on **the needs for a CoP was provided by** All Digital[31,32] which is a leading pan-European association based in Brussels, representing 60+ member organisations that work with 25,000 digital competence centres, providing training and advice to 3 million people in Europe every year. All Digital member organisations constitute **one of the major European communities in the field of digital skills**. The key aspects of All Digital operations were presented:

- three transversal areas of services to members (Capacity building, Advocacy and Research and Innovation),
- its operational practice, governance, procedures, and shared collaboration space,
- operational teams, working groups (DigComp, Digital Cultural Heritage, Artificial Intelligence) and thematic clusters (Basic digital skills, Employability and entrepreneurship, Coding, Digital media literacy, STE(A)M skills for society),
- instruments, tools and resources,
- communication tools and campaigns, annual summit, annual awards, and,
- major projects.

Also recommendations for do´s and don'ts for a successful CoP, based on All Digital's experience, were presented to inspire the participants to the working session.

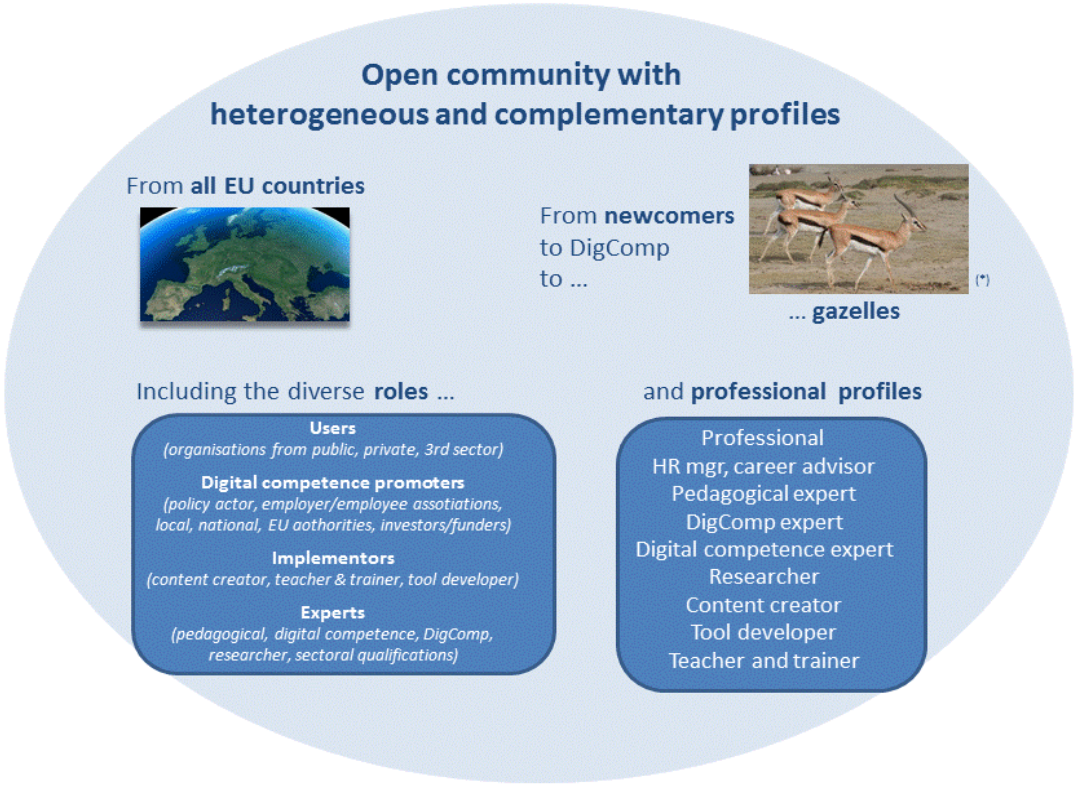
The stakeholders working session concluded on **the major purposes** of a Community of Practice (CoP) around DigComp, which would be the following:

[31] www.all-digital.org

[32] The presentation provided by Achilles Kameas, Chair of the Board of All Digital can be accessed at : https://www.ikanos.eus/wp-content/uploads/2019/07/190620.All_.Digital.Communities.of_.Practice.pdf

PURPOSES of a potential DigComp Community of Practice	
Share **documentation**, in an organised way, on: ▪ **Both successful and unsuccessful experiences** in applying DigComp. These experiences could be in the form of video, document, etc. ▪ **Good tools** that can be adapted and used in the future. ▪ **Practical DigComp implementation guides** with concrete cases and good implementation practices. ▪ **Good practices:** good practices identification, criteria for good practice classification, key needed aspects and existing gaps.	Support the design of **professional digital profiles:** ▪ By **sharing information** on the application of the digital framework of competences for different professions and the related Professional Digital Profiles ▪ By **providing a reference** of professional digital profiles, i.e., of the digital skills that are needed in different professions, so that community participants can benchmark the skills they need to develop.
Provide a **place for discussion**: ▪ between different working groups, ▪ face-to-face or in virtual mode, ▪ to propose solutions related to specific aspects: certifications, profiles, training, etc., and, ▪ to discuss how to improve implementation materials, ▪ to hold regular webinars	Inform about the latest **news**: ▪ on CoP activities and content shared or develop within the CoP ▪ on relevant information that any member of the community can share with the rest ▪ related to development, research and application of the DigComp Framework.

***Figure 4**: Membership characteristics of a potential DigComp Community of Practice*



(*) By Rob & Dani - Thomson's Gazelles - Ngorongoro Crater, CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=3966250

The **Membership characteristics** of the CoP are depicted in the Figure 4 above as an **open community** with **heterogeneous** and **complementary profiles**.

The stakeholders suggested the following **Governance components** for a successful potential DigComp CoP:

GOVERNANCE components of a potential DigComp Community of Practice

Structure:

- **Elected management group/committee**
  To ensure the CoP works in alignment with the CoP objectives (ToR)
  To represent the CoP and its Members
  To ensure agreed tasks are accomplished
  To prepare reports on the CoP activities
  To support the working groups
  To ensure the Quality
  To take an active role in the promotion of the CoP
- **(Secretarial) Support team**
  To monitor the CoP activities
  To provide the technical platform and support
  To oversee that members respect the agreed rules
- **Thematic working groups / projects**
  To work on specific topics
- **(rotating) Topic leaders**
  To support the working groups / projects
  To act as moderator and topical supporter
  To coordinate the work around the topic

Operating mode:

- Terms of Reference (ToR) defined and declared
- Agreed working rules
- Members are responsible to perform a set of shared, defined and self-managed tasks and hold periodic follow-up meetings
- Co-operation is promoted
- Members commit to devote time to participate to the CoP, generate and share content

Operational Costs:

- Incentivise / reward Members´ participation
- Specific costs related to launching the CoP
- Management activities
- Promotional campaigns
- Support activities (by support team)

Financial Resources:

- EU/National funding for launching
- Sponsors
- Membership Fees

Communication / promotional activities:

- CoP promotion in social networks and newsletter, etc, to recruit new Members
- Make use of experts´ networks to promote the CoP
- Management team to play an active role in personally inviting new Members
- Organisation of events

The needed **Tools** for an effective operation of the CoP would be:

TOOLS needed for effective operation of the CoP	
Own brand	▪ To support the promotion of the CoP ▪ To support Members sense of belonging
Free code tools	▪ To maximise support to other Members or stakeholders by sharing tools ▪ To minimise operating costs
On-line platform / application	▪ CoP Management functions ▪ Content management / repository of good practices, tools, etc ▪ Access and sharing content ▪ Collaboration tools: – Share and promote content among Members – Virtual spaces for debating specific topics – Virtual spaces for holding periodic webinars – Schedule and hold virtual meetings – Schedule and prepare face-to-face meetings ▪ Publication of information or news among CoP Members
External periodic Newsletter	▪ To support the promotion of the CoP ▪ To disseminate content created by the CoP Members

With regard to **priority setting**, stakeholders pointed at the following elements having the highest importance:

- With regards to Purpose, the sharing of successful and unsuccessful experiences in applying DigComp
- With regards to Member profiles, the importance of including those who have successfully implemented DigComp to share their experience with other Members
- With regards to Governance, the importance of an elected management group or committee
- With regards to the needed supporting Tools, the importance of on-line collaboration tools.

3.3 Panel discussion 1: Effective awareness raising and engaging actions towards stakeholders

The aim of the panel sessions was to consult a maximum number of stakeholders on a number of questions identified important through the research project. The (numerous) panel members and the Q&A sessions that followed panellists statements allowed a maximum participation of stakeholders in the debate.

Background	*In spite of the fact that DigComp is quite well known in the educational sector and among actors active in digital skills development, the case studies highlight that in the world of work, i.e. among employers and labour market intermediaries, there is overall a very low awareness and understanding of what digital and entrepreneurial competences mean, of the existence of both competence frameworks and how they can contribute to develop these key competences.* *The biggest suggested area of action is the promotion and visibility of DigComp framework at both national and EU level.*
Purpose	Identify which are the key target audiences and which would be effective communication strategies adapted to these target audiences.
Questions	1. "Who to talk to": a) Which types of actors (both enterprises and labour market intermediaries) need to be informed, mobilised? and b) Which is the role enterprises´ HR departments and how to access them? (they are invisible actors) 2. Which are the drivers or motivation factors for these actors to engage in digital competence development as a transversal competence across the organisation? 3. Which are the right information channels, and which type of information is needed (economic, strategic, technical, all public) and in which format?

Discussion conclusions

Context

The participants confirmed the conclusions of the study on the lack of awareness among employers about the need for digital competence development for all companies, the breath of the scope of digital competence as proposed by DigComp and about the existence of the DigComp Framework in support of digital competence development.

However, employers should not only know about what and how to develop digital competence of their employees. They should also understand the strategic impact that the digitalisation is bringing to their business and business model, and the need to change the company culture. Service and consultancy firms accompany them in that sense. An element of this transformation, is the need to up-skill employees on digital competences, and also soft skills. The latter are also an area where employers, and in particular their HR departments, lack knowledge about.

When referring to employers, one should take into account the huge diversity of situations, and in particular, the impact of company size on the way it is organised, managed and how and if employee training takes place. More pragmatic approaches are needed for small companies.

Target audience

A key message from stakeholders is that, although the final aim is to up-skill employees to support the digital transformation, the set of actors targeted by a communication campaign should include other actors than entrepreneurs: business support (consulting) organisations as influencers, policy makers at national and regional level, labour market intermediaries, due to their multiplier effect, such as public employment offices, employers´ associations, trade unions, education and training organisations and third sector. Those designing occupational standards and designing and delivering training should be targeted too. Finally, students (as future employees), employees and society at large should also be targeted and in this case, intermediary organisations such as universities, schools and libraries could also play an intermediary role in communicating about the benefits of developing digital competence for work and life.

With regards to target audience within employers´ organisations, and with a broad perspective of the impact of the digital transformation, HR departments in charge of employees´ training seem the natural interface. However, stakeholders´ experience shows that a broader approach is needed, including business managerial positions and/or a influencer/champion in the organisation which would be open to initiate the project in a part of the company to show evidence and spread the project in a second phase. The reason for that is twofold: on one side HR departments do not always feel it is under their responsibility to train on digital competence because this is perceived as "technical" (as they are not aware that this competence concerns all staff), and on the other, the impact on current and new job profiles due to the digital is better understood by the strategic and functional departments of the organisation.

An additional element to take into account when addressing employers is the size of the company. While big companies have HR departments, small ones do not, and the ideal interlocutor is in general unclear as often decisions are taken by more than one person.

Communication content

The information needed to mobilise the different actors will need to be adapted to the audience. However, it appears clear that a cost/benefit message or message outlining the impact of up-skilling actions using the DigComp Framework and examples of good practices would be key for mobilisation, whether for the employer or the final user (citizen, unemployed, employee). To support that communication, rigorous evidence-based research would be needed. At the same time, some research in this direction is ongoing (Poland, Lithuania), i.e. future research could capitalise on those efforts.

Several content suggestions were provided for different stakeholders:

- For policy makers and government bodies at national and regional level, guidance on how to take systemic action (for example through public funding) and involve multiple stakeholders so as to support public-private cooperation and the development of a DigComp ecosystem.
- For those involved in implementation activities, a DigComp Toolkit would be a supportive content to mobilise stakeholders. In particular, for those designing and delivering training, guidelines on how the Frameworks can support their objectives would be effective.

- For entrepreneurs, dashboards on the aspects / evidence of what could change in their organisation thanks to digital competence development, illustrated with visual tools would be needed, accompanied by advice on the impact on the business and the business model.
- For entrepreneurs, career advisers, trainers, the availability and use of a Self-Assessment Tool would support their mobilisation. For example, for small companies such a tool would allow them to become aware of several digital issues (e.g. data security and privacy aspects). Students could use the results to get a job, or to become aware of their skills gaps.
- For several actors, the use of "story telling" techniques would support an effective communication.
- For entrepreneurs, understanding the professional digital profiles associated to the different business functions (marketing, production, project management) – which competences are important for which job profiles - , and the availability of training linked to those would support their mobilisation.
- For the whole ecosystem of actors, open education and (academic) research approaches would support the promotion of DigComp as a de-facto standard, through a consensus building process, based on good knowledge and evidence.
- For citizens in general, understanding the impact of digital competence on their career opportunities, on their work and family life.

Communication channels

It is obvious that the communication channels will need to be adapted to the target audience. While a face to face contact with policy makers would be needed so as to establish trust, more mass campaigns addressed to entrepreneurs through conferences or meetings, or other (social) media to young people could be effective. In any case, relevant associations, EU or national representative bodies of each different type of stakeholders should be considered, as these are places that bring stakeholders together, becoming effective communication channels.

The role of intermediary actors was outlined, such as for example training centres, libraries. In particular, it was suggested the potential role of DigComp Ambassadors as communication and support agents complemented by a National Coordinator, a body that could support the strategic approach, and develop a network of contact points who also have ownership and expertise.

Finally, the importance of geographical coverage (national, regional, local) was important to ensure the message reaches all. This might require an organisational structure for communication involving numerous actors such as training centres, Ambassadors, etc.

3.4 Panel discussion 2: Priority sectors, occupations and profiles for digital skilling actions

Background	*Digital skills have become crucial for employability. Not only considering its role as a transversal skill to develop employability, but also because about 85% of all EU jobs need at least basic digital skill level, according to CEDEFOP. In spite of that, still 43% of European citizens lack digital skills to be able to fully participate in and benefit from the digital society.* *Besides the need for IT experts, digitalisation also calls for all workers to have a relatively high minimum level of ICT skills, even those in low-skilled jobs. For instance, this is the case for blue-collar workers in factories that are entirely automated or waiters having to take orders on iPads (OECD Skills for a digital world, 2016). A key case is thus for employees and job-seekers, which may not have experience or confidence with their digital skills, and at the same time the nature of their jobs, the sectors they work in and their lives are increasingly influenced by digitalisation.* *Targeted, relevant systems and responses are needed to offer digital skills development to individuals.*
Purpose	Understand, from the field experience perspective, which target sectors, occupations and individual profiles are or will be more affected by the digital transformation and may become more vulnerable from the employability perspective. These could be the target of future skilling policy actions.
Questions	1. Looking at the employees, are there or will there be specific sectors and related occupations more affected by the digital transformation that would need policy attention? Which generic profiles (i.e. administrative assistant, sales person, project manager, etc.) are most affected by digitisation at work? 2. Taking a general population perspective, are specific individual profiles more affected, and needing specific attention (NEET, migrants, etc)?

Discussion conclusions

The stakeholders agreed that to find out those most in need of targeted digital (up-)skilling actions, the **sectoral approach is not relevant**. Instead**, other factors** affect the level of skills and training received, shaping the need for training:

- **Company size**: Small companies might be affected by digitalization but they do not have the resources to train; the self-employed don´t get training; and micro-company owners report having no digital skills.
- **Job skill level**: low skilled (for example lower administrative roles) are heavily affected by automation. Companies tend to train more high-skilled people, and many low skilled workers do not receive training at all.[33]

[33] An example of how low level low skilled jobs in the service sector are affected by the digital transformation can be seen in the Cruz Roja /Accenture report *"El impacto digital en los colectivos vulnerables, una nueva forma de trabajar" / "The digital impact on most vulnerable groups, a new way of working"*, which has analysed the job profiles transformation for 26 jobs and the related new digital skills associated with each job profile. Available here: https://juntosxelempleo.com/documents/31649/31810/Informe+Nacional/0d38b8ba-f756-4eaa-a2ef-40b4ce246ccd

- **Geographical location**: People from non-urban / rural areas (up to 20% of total population in countries such as Portugal) have less access to public training as there is not a sufficient critical mass to organise training locally (according to the European Social Fund rules). In addition, this population tends to have less qualifications and be more affected by unemployment.
- **Working timetable**: People working in shifts at night, who do not have access to "day time" training opportunities, are left behind in the technological transformation, in spite of the fact that their jobs are affected by it.
- **Contract type**: Temporary staff often receive no training and in high turnover jobs
- **Age**: older workers tend to have lower digital skills
- **Level of experience**: Young and unexperienced people are more affected by unemployment and usually lack professional digital skills
- **Migrants** and migrant women in particular are often less digitally skilled, although this is a very heterogenous group of people

In spite of the general consensus that the sectoral approach was not effective to identify target groups in need of up-skilling actions, **several sectors** were mentioned by stakeholders, who, through their experience, have identified that had important need for digital competence up-skilling. These are: metal sector (PT), public administration (IT), social professions such as health sector (IT, GR) and psychology (IT), teachers and trainers (GR), cultural sector with intercultural mediators (GR), industrial and engineering companies (Latvia).

Tips suggested for training actions:

1. Although some competences are transversal to the different jobs, it is important to understand how digital transformation will change job profiles, and design training consequently, i.e. adapted to the specific future job profile.
2. Some of the barriers to digital competence acquisition are related to individual psychological approaches to technology including resistance, fear, etc. For some target groups, digital training actions should include specific approaches to address these barriers linked to individual mind-set.

Executive summary in English available here:
https://juntosxelempleo.com/documents/31649/31810/Executive+Summary/00f45686-662d-4020-8cb9-a8e2e23e91e7

3.5 Panel discussion 3: Bundling digital skills with other skills needed by the labour market

Background	*Research shows that as technology automates certain tasks, the value of skills needed for non-automatable tasks, such as social skills, also increases (Autor, 2015; Deming 2015).* *Workers will thus have to be able to take on complex, less automatable, tasks such as problem solving in novel situations while working with the new technologies. This requires solid literacy, numeracy and problem-solving skills, but also autonomy, co-ordination and collaborative skills which complement ICT skills (OECD, 2015a, Deming, 2015-2017).*
Purpose	*Understanding what is the reality at enterprise and other labour market stakeholders about the awareness, understanding and management of the evolving "set of" competence needs.*
Questions	1. How do enterprises manage the concept of "digital competence" compared to the traditional view of IT skills? 2. Which other (soft, transversal) competences are a priority for the labour market in addition to digital? 3. How to design skilling actions (training and other learning experiences) of a "set" of competences. In particular, how digital competences contribute to develop soft skills and vice-versa?

Discussion conclusions

The impact of technologies at large is transforming the way companies work affecting several strategic domains: business strategy, business model, the way customers are managed, the use of data intelligence, production modes, job profiles, company culture. In order to put the digital transformation at the benefit of the organisation, i.e. to remain competitive in the new scene, implies that a corporate change needs to be properly led and managed.

In this change, a varied set of skills are needed: change leadership, openness and flexibility to change and align mind-sets from different perspectives (intergenerational young-older, HR – business – ICT- marketing), soft skills (team work and collaboration skills, communication skills, problem solving), entrepreneurial skills, specific technical skills (AI, big data, etc) AND digital competence as defined by DigComp.

In this context, the actions needed to accompany this transformation beyond skilling and training are:

- Open transformation approaches, which include different activities: group sharing sessions for company managers and their peers, hackatons, to promote openness to change. EntreComp can be used to design pathways and change programmes.
- Skills assessment and development (DigComp here has a role to play for digital competences)
- Blended learning is recommended as more effective than on-line learning.

- Project based learning where teachers take new tutoring roles, and where a combination of skills are developed to achieve a particular project goal (for example, teaching Dutch language to migrants in combination with digital tools and VET) and support the development of self-confidence with respect to digital skills.

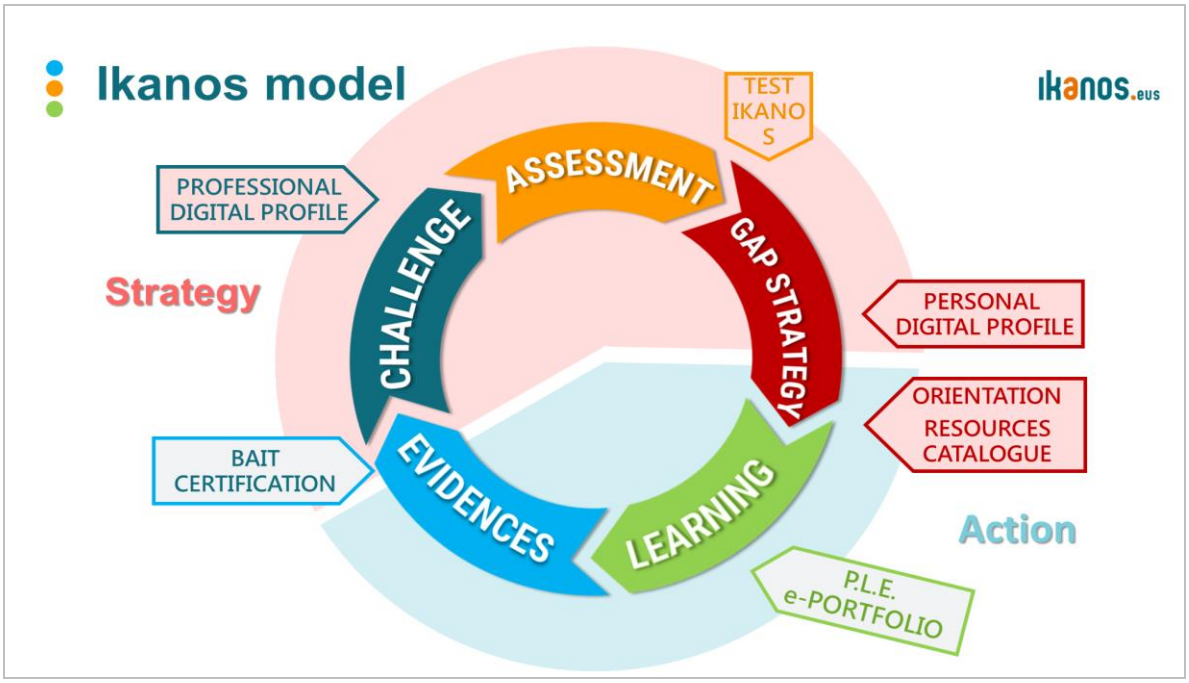
The development of digital competences and DigComp as a framework have a role to play, which needs to be understood in this broader context of company transformation.

4. Future outlook: inspiration from Basque organisations

4.1 Ikanos project[34]

The Basque Country Government launched in 2012 the Ikanos project[35] to create a "learning support infrastructure" for the digital competence needs of citizens, enterprises, civil servants and others. DigComp was chosen from the beginning as the reference framework of all Ikanos actions, which are enabling widespread digital transformation in the Basque Country and becoming a pioneer user of DigComp.

Ikanos has used a strategic approach to digital competence development, and developed the accompanying tools to support each step of the approach, as illustrated in the below figure:



The strategy involves the following **steps** and supporting **tools**:

1. The definition **of professional digital profiles (PDP)** needed (**challenge**) by the employers.
2. The **assessment** of (unemployed and employed) individuals´ digital competence with **a self assessment test**[36] which provides a **Personal Digital profile.**
3. The requirements of digital activities of all kinds of professions are modelled on a **Professional Digital Profile**. to facilitate benchmarking and the task of orientation.
4. The results of the test allow the Career Advisor, with the help of an **Orientation Guide,** to perform a **Gap analysis and define a suitable learning path** with the support of a **Resources Catalogue.**

[34] The presentation provided by Ana Vitorica, Director of Ikanos project, can be accessed at Ikanos webiste.
[35] The Ikanos project has been analysed and documented within the present project among the 9 Digcomp cases.
[36] Used by over 50.000 citizens

5. Digital competence continuous **Learning** is supported by a **Personal Learning Environment**.
6. **Formal Certification** can provide **evidence** of the progress achieved.

The structural nature of Ikanos (and not a time-limited funded project) shows how **a public initiative can act as a driver** of a digital competence development project across the society. Elements of this structural nature are the following:

- The establishment of institutional co-operation relationships with the industry sectors most in need of digital competence development among its employees, such as the Industry 4.0 and Healthcare sectors. Through this cooperation, 4 sets of Professional Digital Profiles (15 in total) have been developed (General, Industry 4.0, Health care and Experts);
- The development of institutional co-operation with Universities to pull digital expert resources and with Education institutions (VET) to implement digital competence education programs
- The establishment of service agreements with technical expertise companies to develop and support the needed technical tools.
- The development of institutional co-operation relations with public employment services.

A key characteristic of Ikanos is its built **ecosystem of actors** which work with DigComp-based "interoperable" resources and services that support the development of digital competences and employability of citizens and support the digital transformation of the business sector and the public administration. This feature also shows the role that public policies and programmes can play in this endeavour.

Future developments of Ikanos on the use of DigComp to support employability include a closer co-operation with the industry on:

- supporting its HR departments understanding the broad nature of what digital competences encompass;
- supporting the industry to develop their training capacity on digital competences in line with DigComp and PDPs definitions;
- modelling the digital competences that support transversal competences (such as self-learning and team working) to support the industry to assess the current competence gaps and related training paths; and,
- developing Personal Learning Environment platforms to support individual learning paths.

4.2 Aernnova[37]: The future of the industry and the role of competence management

Aernnova, Headquartered in Spain, is a private company that has become a world-class supplier of integrated aerostructures, components and engineering services. It has expanded its presence globally through its Manufacturing and Engineering Centers in 7 countries in Europe, America and Asia. With +700M€ revenue, it employs + 4600 people.

For Aernnova, competence management is key for success. The presentation illustrates how a public-private collaboration model between industry and E&T providers to address the "4.0" skills gap in the industry sector, combined with a strategic approach for in-company competence management review constitute an **effective model** to address the skills challenge in a sector with a fast high-technological evolution leading to new professional profiles needing new skills and competences.

The Advanced Manufacturing area is one of the Basque Country's RIS3[38] priorities whose strategic deployment is being developed through a **public-private collaboration** launched in June 2015. One of the aims of this collaboration is to promote, through education and training for employment, the generation of talent and the availability of qualified professionals today and in the future in the priority lines identified by the Advanced Manufacturing sectors.

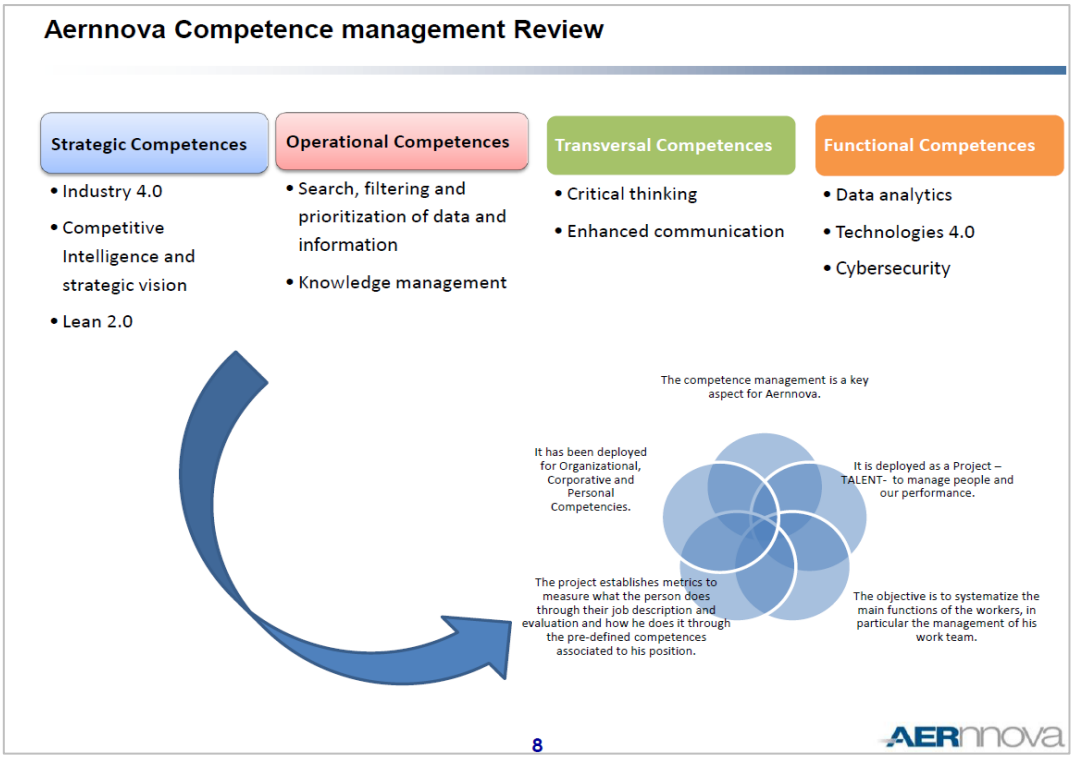
The Basque Industry 4.0 **sectoral approach** to achieve the above objective focuses on coordinating the talent **offer and demand,** by:

a) Analysis of the demand : Identifying the 4.0 technology evolution; the (new) professional profiles; and a map of skills and competences per sector, technologies and professional profiles
b) An analysis of the current E&T supply : provided in formal and non-formal settings (Universities, VET, continuous training, steam strategy)
c) Analysis of the gaps between demand and supply, which provides input for company (Aernnova) competence management review on the demand side and an E&T plan for employment on the supply side.

In the above context, Aernnova´s **strategic approach** to competence management encompasses:

- In-company competence management review with a strategic approach that links personal development with company performance. In its operationalisation it incorporates systematic job function definition with related competences and individual evaluation across the latter. This strategy focuses on Organizational, Corporative and Personal Competencies (see the below figure), and the current trend is to incorporate digital and transversal competences, following the demand from the Industry 4.0 labour market.
- Active support to a stronger connection between education, industry and research centers, with active participation to R&T projects, in particular to those financed by the EU Framework Program, which have become key enablers for innovation and progress.

[37] The presentation was provided by Miguel Ángel Castillo, VP Technology Development, and is available at the Ikanos site.
[38] RIS3: Research and Innovation Strategies for Smart Specialisation, see: https://s3platform.jrc.ec.europa.eu/s3-guide



5. Conclusions

The research outcomes well received and the conclusions and recommendations were endorsed by the workshop participants. Research and policy **support** in several areas **will be key** to achieve wider DigComp use by multiple stakeholders with the aim to develop digital competences in employability contexts.

Systemic approaches promoting public-private-third sector cooperation and dialogue emerge as the only possible approach to develop an **ecosystem of actors** in regional or national contexts, using the same reference concepts and definitions and developing re-usable and interoperable solutions.

Stakeholders have expressed high interest and need for support to launch and run a **community of practice** around DigComp, which purpose, tools and governance have been discussed during the workshop. The highest priority in that regard is the need to share respective knowledge, experience and perspectives and develop opportunities for collaboration.

To promote the role of DigComp in digital competence development in employability contexts, the impact that **digital transformation** is having **in companies** needs to be better understood, as these are one of many skills needed by employees in this changing context, and skilling is one among many other actions necessary to take to lead and manage the change brought about by technological evolution. In this context, the coexistence (in terms of labour market demand) and synergy (of acquisition processes) of **digital and soft or transversal competences** should be further explored. In this context, it was discussed that the future **European Platform on Digital Skills and Jobs** could play a role in responding to these needs.

Annex 1: Workshop Agenda

Developing digital competences for employability:
How to engage and support stakeholders and the potential role of DigComp
Stakeholders´ consultation workshop

Day 1: Wednesday, June 19th, 12h00-18h00, Day 2: Thursday, June 20th, 9h00-17h00,
Bilbao, Basque Country, Spain

Day 1, June 19th: Debating and validating research results	
12h00	Registration opens, DigComp cases presentations by case owners, Networking session
13h00	*Networking Lunch*
14h00	Welcome note by *Basque Government, A. Vitorica*
14h10	Key note *by A. Vitorica, Basque Government (Ikanos)*, "The Ikanos project: trajectory, achievements and future vision"
14h30	Policy context by *EC DG EMPL, W. O´Keeffe*
14h45	Research context and Workshop objectives by *EC JRC, Y. Punie, C. Centeno*
15h00	Organisational matters by *EC JRC, C. Centeno*
15h10	Presentation of research results: Mapping DigComp use for Employability by *S. Kluzer, expert*
16h00	*Coffee break*
16h20	Q&A, Debate on research and policy recommendations
17h00	Group work on stakeholders needs, priority setting session
17h45	Report to plenary
18h00	End of day
Day 2, June 20th: Future avenues to support and engage stakeholders and enterprises	
9h00	Introduction: Conclusions of Day 1 by *EC JRC, R. Vuorikari*, rapporteur
9h15	Panel session 1: Effective awareness raising and engaging actions towards stakeholders
10h30	*Coffee & breakfast break*
10h45	Panel session 2: Priority sectors, occupations and profiles for digital skilling actions, understanding the problem
12h00	Panel session 3: Bundling digital skills with other skills needed by the labour market: how to move forward?
13h30	*Lunch*
14h20	Working sessions: Introduction
14h30	Parallel working sessions: Session 1: Developing supporting material Session 2: Promoting or building a community of practice
15h30	Working sessions: Report to plenary
16h00	*Coffee break*
16h15	Coalition for Digital Skills and Jobs: Future vision and strategy by *EC DG EMPL, W. O´Keeffe*
16h30	Looking at the future: The future of employment and role of competence management at the industry by *Dr. Miguel Ángel Castillo Acero, Aernnova*
16h45	Closing session: key conclusions and next steps by *EC DG EMPL, W. O´Keeffe* and *Ikanos, A. Vitorica*
17h00	End of meeting

Annex 2: Workshop Participants

EXPERTS	
BARTOLOME Juan	TECNALIA, Spain
BROLPITO Alessandro	European Training Foundation, Italy
CASTILLO Miguel Ángel	Aernnova, Spain
CHARTERINA Jon	University of the Basque Country-UUPV/EHU, Spain
CHIMENO Eva	Spanish Red Cross
DE LA CUESTA PADILLA Gabriel	Junta de Andalucía, Spain
DE RIDDER Monique	Catholic Education, Vlaanderen , Belgium
DIONISIO Hugo	European Trade Union Confederation, CGTP-IN, Portugal
GARCÍA SACIDO Federico	Spanish Red Cross
GREEN Anne	University of Birmingham, United Kingdom
JAKOBSONE Mara	LIKTA, Latvia
KAMEAS Achilles	Hellenic Open University, Greece
KEKKI Kirsi	European Trade Union Confederation, TUC, United Kingdom
KLUZER Stefano	Expert, Pane e Internet – DCDS, Italy
LEJARZEGI Roberto	Ibermática, Spain
LOVINO Pasquale	Mylia- The Adecco Group, Italy
MANTIONE Filippo	Lai-momo Societá Cooperativa Sociale, Italy
MARTÍNEZ DE SORIA Iker	TECNALIA, Spain
MAZZINI Marco	Smartive, Italy
MCMULLAN Lisa	The Women's Organisation, United Kingdom
MILOSZ Marek	ECCC Foundation, Poland
PAVLIC Tamara	Croatia Employment Service, Croatia
SASIGAIN Patxi	Adegi- Employers´ Association, Gipúzkoa, Spain
STACCIOLI Nicoletta	Anpal Servizi, Italy
TELLERIA Iñaki	Tknika, Innovation VET, Spain
YAHAYA Gori	UpSkill Digital Limited, United Kingdom
BASQUE GOVERNMENT (IKANOS), HOST INSTITUTION	
VITORICA Ana	IKANOS, Basque Government, Spain
EUROPEAN COMMISSION	
CENTENO Clara	Joint Research Centre – Directorate B –B4 Unit
PUNIE Yves	Joint Research Centre – Directorate B –B4 Unit
VUORIKARI Riina	Joint Research Centre – Directorate B –B4 Unit
O'KEEFFE William	Directorate-General for Employment, Social Affairs and Inclusion (EMPL)

Panel discussion 1 Effective awareness raising and engaging actions towards stakeholders Chair: European Commission, DG Employment and Social Affairs, William O´Keeffe	
Panel members	– DigComp Case: Adecco-Mylia(IT), Pasquale Lovino – DigComp Case: ECCC (PL), Marek Milosz – European Training Foundation (ETF), Alessandro Brolpito – Latvian ICT Association, LV, Mara Jakobsone – The Women´s Organisation (UK), Lisa McMullan – Adegi, Employers´ Association (Gipuzkoa, Basque Country, ES), Patxi Sasigain
Panel discussion 2 Priority sectors, occupations and profiles for digital skilling actions, understanding the problem Chair: European Commission, Joint Research Centre, Clara Centeno	
Panel members	– DigComp Case: Museum Sector Alliance (EU), Achilles Kameas – DigComp Case: Compass (EU), Filippo Mantione – DigComp Case: Prodigeo (IT), Nicoletta Staccioli – Cruz Roja (ES), Eva Chimeno – European Trade Union Confederation, Hugo Dionisio (PT) – CISOK-Lifelong Career Guidance Centres (HR), Tamara Pavlic – Upskill Digital (UK), Gory Yahaya
Panel discussion 3 Bundling digital skills with other skills needed by the labour market: how to move forward? Chair: Expert, Stefano Kluzer	
Panel members	– DigComp Case: SmartiveMap (IT), Marco Mazzini – European Trade Union Confederation, Kirsi-Marja Kekki (UK) – Adult education Vlanderen (BE), Monique De Ridder – Tknika, Innovation VET (Basque Country, ES), Iñaki Telleria

Annex 3. Consultation methods and detailed results

In this Annex are summarized the method used and the detailed results of the research and policy prioritisation exercises.

A3.1 Consultation on research priorities

The aim of the consultation was twofold: 1. to identify possible missing research recommendations, and 2. to identify stakeholders´ priorities among those identified by research and stakeholders. For that purpose, participants were given the 2 research reports with the 9 DigComp use cases and the cross-case analysis; and the research recommendation categories as included in the report and listed in section 2.4.

A discussion took place to identify if research recommendations were missing. Then a voting took place were each participant had 5 priority points to distribute freely among different recommendations. Participants provided their votes to levels R1.1, R1.2, R1.3, R2.1, R2.2, R3, R4, R5, and R6. For analysis purposes, results have been added-up for R1 and R2.

Results

1. Two additional recommendations (R5, R6) where suggested by stakeholders during the discussion session that took place prior to the voting, in two working groups, indicated by (*).
2. Following that addition, voting took place, with the following results:

Research recommendations		Votes #	Votes %
R1. Clarify ambiguities and unclear aspects of DigComp		20	16,5
	R1.1 Identify and/or propose mechanisms to drive use of progression or proficiency levels	*11*	*9*
	R1.2 Explore interdependencies and differences between competences	*3*	*2,5*
	R1.3 Resolve ambiguities in competence definitions (clarify competences)	*6*	*5*
R2. Investigate and provide guidance on how to co-develop DigComp and other competences and related Frameworks		28	23
	R2.1 Interconnection among digital, entrepreneurial other key competences and soft skills	*17*	*14*
	R2.2 Better understand links between competence and qualification frameworks	*11*	*9*
R3. Compare and identify approaches/tools on digital competence assessment for mutual recognition and reusability		22	18
R4. Measure DigComp competence development impact in companies and other organisations (i.e. public services)		36	30
(*) R5. Good practices on co-working of DigComp and EntreComp		14	12
(*) R6. Methodological Guide to develop assessment tools			
	Total	120	100

A3.2 Consultation on policy priorities

The aim of the consultation was twofold: 1. to identify possible missing policy recommendations, and 2. to identify stakeholders´ priorities among those identified by research and stakeholders. Participants were given for that purpose: The 2 research reports with the 9 DigComp use cases and the cross-case analysis; and the policy recommendation categories as included in the report and listed in section 2.4.

A discussion took place to identify if policy recommendations were missing, so as to add them to the table. Then a voting took place where each participant had 5 priority points to distribute freely among different recommendations. Participants provided their votes to levels A.1 to A.5, B.1 to B.4, C.1 to C.4, D and E. For analysis purposes, results have been added-up for A, B. C and D.

Results

1. Recommendations B5 and E (marked with *) were added by stakeholders during the discussion session that took place, prior to the voting, to each of the groups that suggested their addition.
2. Following that addition, voting took place, with the following results:

Policy recommendations		Votes #	Votes %
A. Supporting DigComp implementation in employability settings		46	38
	A.1 Strengthening the value of DigComp implementations for employability with a DigComp compliance "label" or DigComp label	*11*	*9*
	A.2 DigComp certification scheme	*4*	*3*
	A.3 Specific awareness raising campaigns among LMI	*5*	*4*
	A.4 Development of DigComp for enterprises	*10*	*8*
	A.5 Enhancing DigComp use in a professional perspective developing Professional Digital Profiles (PDPs) and linking them to ESCO	*16*	*13*
B. Awareness raising and increasing policy effectiveness		27	23
	B.1 Targeting the right audiences	*8*	*7*
	B.2 Creating visibility through awards and presentations	*6*	*5*
	B.3 Develop communication support material	*5*	*4*
	B.4 Develop more synergies among/with EU policies and instruments	*8*	*7*
	(*) B5. Create a European Community of DigComp Ambassadors		
C. Support and promote knowledge sharing and co-operation among stakeholders		36	30
	C.1 Build Expert steering groups for competence frameworks development	*4*	*3*
	C.2 Build a European Community of Practice	*6*	*5*
	C.3 Develop implementation support material	*24*	*20*
	C.4 Knowledge Centre (KC) for European Key Competences	*2*	*2*
D. DigComp governance and sustainability mechanisms		9	7,5
(*) E. Guide at EU/national level on how to implement DigComp connected to EU/National QF, Occupational Standards and E&T Quality Standards		2	2
	Total	120	100

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