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Critical Review: Measures of Digital Competency Related to Employability

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ABSTRACT

Digital competence could gain a competitive advantage for enterprises. The study was to understand the relationship between digital competence and employability. The evolution of the European Union Digital Competency frameworks was analyzed to derive measures that could be tested with employers. DigComp 2.2 provides an integrated framework of competency areas, their descriptors, proficiency levels, skills, attitudes, and knowledge applicable to employability. Knowledge was the key driver of digital competency, with measures of artificial intelligence emerging across competency areas. Also, attitudes were found to have a moderating effect between digital competency and employability. However, due to the diverse nature and employability requirements by firms and from different economic sectors, further studies targeted at a diverse group of employers could establish digital competencies in demand.

La competenza digitale potrebbe fare ottenere un vantaggio competitivo alle imprese. Lo studio mira a comprendere la relazione tra competenza digitale e occupabilità. È stata analizzata l'evoluzione dei "quadri" delle competenze digitali dell'Unione europea per derivare misure che potrebbero essere testate con i datori di lavoro. DigComp 2.2 fornisce un quadro integrato di aree di competenza, i loro descrittori, livelli di competenza, abilità, attitudini e conoscenze applicabili all'occupabilità. La "conoscenza" è stata il motore chiave della competenza digitale, con misure di intelligenza artificiale che sono emerse in tutte le aree di competenza. Inoltre, è stato riscontrato che gli atteggiamenti hanno un effetto moderatore tra competenza digitale e occupabilità. Tuttavia, a causa della diversa natura e dei requisiti di occupabilità delle imprese e dei diversi settori economici, ulteriori studi mirati a un gruppo eterogeneo di datori di lavoro potrebbero stabilire le competenze digitali richieste.

Keywords: digital competency, employability, framework, proficiency, problem solving

1 – Introduction

Digital transformation is the key modern direction of global economic development (Sepasvili, 2023). Governments globally have embarked on digital transformation agendas to be part of the fourth industrial revolution (4IR) as it has proved to be one of the methodologies of improving efficiency and speed in developing a sustainable strategy (Riva & Pilotti,

2022). 4IR involves the automation of processes, big data generation, machine learning for decision-making and universal connectivity. Rojko (2017) explained that 4IR affords businesses mass customization production using information communication and technologies (ICTs). Companies continue to adopt such technological advancements for competitive advantage. According to Porter's Five Forces, businesses gain a competitive advantage from the competencies of human resources.

Since 2006, digital competency has been one of the eight recommended competencies in the European Union (EU) framework for lifelong learning. Subsequently, the European Commission (EC) consulted with stakeholders to develop and update digital competency frameworks for learning and employability. Hanna (2017) suggested dire consequences for late adopters of digital technology due to the competitive advantage of early adopters. Consequently, governments, businesses and international organizations are sponsoring digital literacy and skills programmes to develop the capacities of their citizenry and customers to partake in the 4IR. The conceptual research was to understand the concept of digital competency and its measures related to employability.

Garrido et al. (2010) found that digital skills are insufficient to improve the employability of low-income job seekers. In modern workplaces, some complex tasks are undertaken relatively easily and at less risk with digital competence. Digital-driven organizations such as Amazon, Meta, Microsoft, and Apple strive against less advanced technology-driven competitors. According to Felstead (2012), using ICTs has implications for the location and timing of task engagement. As a competitive advantage, multinational companies (MNCs) have integrated information and communications technology into their operations to minimize costs and improve their lead and response times to markets. European MNCs will likely expect similar digital competencies from expatriate employees and employees in host countries abroad. The research question is: How are the measures of digital competency related to employability?

The study was to find a conceptual framework for digital competency and its measures related to employability. The research is intended to understand digital competency and what measures are related to employability. The study would be helpful for labour market stakeholders to know the relevant digital competencies for an efficient and effective workplace. Also, the study provides a guide on identified measures of digital competencies to be tested with employers for prospective employees and recruiting agencies.

2 – Methodology

Peer-reviewed literature on employability-related digital competency was searched using scholarly search engines, namely Scopus, Semantic Scholar, and Google Scholar. Tranfield and others (2003) posit that a literature review is an essential tool that is utilized to enhance debate and disseminate academic results from different studies. In order to obtain relevant current scientific articles for analysis and discussion, the search was limited to the period between 2013 and 2022.

Most of the peer-reviewed articles found focused on digital competency pertaining to learning. The relevant literature on associating digital competency and employability was mainly with the evolution of the European digital competency framework. Guided by Pak (2022), the review pursued inductive and deductive methodologies. The changes in the digital competency frameworks were analyzed and discussed. Also, other studies on conceptual frameworks relating to digital competencies and employability were analyzed and discussed.

3 – Evolution of the European Union Digital Competency Framework

The European Commission (EC) sponsored the digital competency project undertaken in 2011 and 2012 to understand the development of digital competency in Europe. Ferrari (2013) reported on a digital competency framework through multistakeholder engagement after collations from conceptual mapping, case study analysis of fifteen frameworks, online consultation of ninety-five experts from diverse fields and an expert workshop involving seventeen external consultants. After the initial proposal by Ferrari, there were partial and full reviews through interviews, presentations, meetings, and a validation workshop involving about forty stakeholders. In early 2015, feedback on the national level, proficiency levels and conceptual framework use cases was gathered in three sessions of four-month intervals for consideration. Vuorikari et al. (2016) updated the framework with new vocabulary and streamlined descriptors to enhance the digital competence of Europeans. As the competency areas and competencies with descriptors were updated, the proficiency levels and the examples of knowledge, skills and attitudes were to be updated in 2016. Consequently, Carretero Gomez et al. (2017) revised the conceptual framework with eight proficiency levels, knowledge, skills and attitude applicable to each competency, and examples of their use for learning and employability. Eventually, Vuorikari et al. (2022) updated the knowledge, skills and attitudes with about 250 samples to help European citizens confidently, critically and safely engage with new and emerging technologies such as artificial intelligence (AI).

3.1 – *Digital Competency 1.0*

Digital competency, defined by the EU, is summarized as the ability to use ICTs for tasks, pleasure, and communication in a confident, safe, and purposeful manner. The initial framework reported by Ferrari for understanding and developing digital competence in Europe had five areas of digital competency. Digital competencies, information, communication, and content creation were deemed for specific activities. Safety and problem solving competency areas cut across the other competency areas. Each digital competency area has four dimensions: competence description, proficiency levels, knowledge, skills, and attitude, as well as application of purpose towards learning and employment. The summary dimensions of digital competency are summarized in Table 1.

Table 1 – *Dimensions and Features of Digital Competency Framework*

Dimension	Name of Dimension	Features of the Dimensions
1	Competency area	Five Competency areas: Information, Communication, Content Creation, Safety and Problem solving.
2	Competence title and description	Each of the five competency areas had its respective competencies and associated descriptors.
3	Proficiency levels	The three proficiency levels, foundation, intermediate and advanced, are described for each competence descriptor.
4	Examples of knowledge, skills and attitude	The examples of attitude, knowledge, and skills are separate groups for each competence descriptor.
5	Application to purpose	The application for learning and employment were separately grouped for each competence descriptor.

The proficiency levels and applications for learning and jobs are categorized into foundation, intermediate and advanced. Ferrari detailed cross-referencing among the competencies as well as guidance on the relevance of digital competency for lifelong learning. However, there was no similar guidance on applicability for employability. The framework has become known as DigComp version 1.0. According to submissions from more than ten EU member states, the original framework was implemented for policy formulation, instructional planning for learning, education and employment, as well as for assessment and certification.

3.2 – *Digital Competency 2.0*

After barely three years of adopting and implementing the digital competency framework, the EC Joint Research Centre (JRC) sought to update the framework in two phases. The first phase focused on the conceptual reference model to update the competence areas and competences. The second phase was to refer to the outcomes of the first phase to refine the eight proficiency levels for each competence. Also, the phase was to monitor the implementation of the framework among countries and provide examples of the knowledge, skills, and attitudes applicable to each competence.

Eventually, Vuorikari and others (2016) updated the vocabulary and descriptors of the competencies in response to the fast evolution of digitalization. The update known as DigComp version 2.0 was intended to align with EU legislation, especially on data protection reform finalized in 2015. Two competency areas, safety and problem solving, maintained their names, whereas the other three were modified as information and digital literacy, communications, and collaboration, as well as digital content creation. The changes in the vocabulary of the competency areas were indicated in bold italics font, summarized in Table 2.

Table 2 – *Updated Competency Areas between DigComp versions 1.0 and 2.0*

Nature of Competency areas	DigCom version 1.0	Changes	DigCom version 2.0
Competency areas for Specific Activities	Information	Modified	Information ***and data literacy***
	Communication	Modified	Communication ***and collaboration***
	Content creation	Modified	***Digital*** content creation
Cross Cutting Competency areas	Safety	No change	Safety
	Problem solving	No change	Problem solving

Generally, the description of each competence was rewritten for all areas.

INFORMATION AND DIGITAL LITERACY

All three competence titles were changed for the modified information and digital literacy area. The first competence title became browsing, searching and filtering data, information and digital content. The second title was evaluating data, information and digital content. The third of the titles for information and digital literacy competence was managing data, information and digital content.

COMMUNICATION AND COLLABORATION

In the case of the revised communications and collaboration competency area, two competence titles, netiquette and managing digital identity, were maintained. However, the three other titles were modified. The modified titles were interacting through digital technologies, sharing through digital technologies, and engaging in citizenship through digital technologies.

DIGITAL CONTENT CREATION

The modified digital content creation area maintained two competence titles: copyright and licences as well as programming. Relatedly, the two revised titles were: developing digital content as well as integrating and re-elaborating digital content.

SAFETY

The safety area maintained two titles, protecting devices and protecting the environment. Moreover, the two other descriptors were modified to become: Protecting personal data and privacy as well as protecting health and well-being.

PROBLEM SOLVING

The solely modified title for problem solving was creatively using digital technologies. The three maintained titles were solving technical problems, identifying needs and technological responses, and identifying digital competence gaps.

3.3 – *Digital Competency 2.1*

Carretero Gomez et al. (2017) expanded the proficiency levels from three to eight to be known as DigComp 2.1 to align with the European Qualification Framework. The foundation, intermediary and advantaged levels were each split into two levels. The advanced level was extended to the highly specialized level, with two stages of creation in the cognitive domain. Both stages at the foundation of the cognitive domain were for remembering; both stages at the intermediary level were for understanding. The first stage of the cognitive domain for the advanced level was for evaluation, and the second stage was for application.

Each of the eight proficiency levels had twenty-one learning outcomes related to knowledge, skills and attitudes. The autonomy of digital competence for employability depended on the competency area, ranging from the first stage of the intermediate level to the final advanced stage. In contrast, the complexity of tasks for employability could depend on the nature of jobs and roles. DigComp 2.1 did not include dimension four on knowledge, skills and attitude. Table 3 shares each competency area and descriptor, from the least to the most proficiency level for employability.

At the foundation, one can remember to do simple tasks with guidance at level 1. The progression to proficiency level 2 is qualified by the ability to perform simple tasks with some autonomy and occasional guidance. Proficiency level 3, which starts the intermediate levels, is achieved by understanding to perform clearly defined routine tasks without guidance. The transition to proficiency level 4 is using a similar understanding as level 3 to independently perform well defined and non-routine tasks to address personal needs.

Proficiency level 5 is the start of advanced proficiencies. Level 5 is qualified by applying knowledge and the ability to guide others to perform different tasks and solve problems. The latter end of advanced proficiency at level 6 is the ability to adapt to a complex environment by

using evaluation to undertake the most appropriate tasks. Both levels 7 and 8, as high specialized proficiency, are achieved through creativity. Level 7 proficiency can resolve complex problems with limited solutions, whereas level 8 proficiency can resolve complex issues with various interacting factors. As level 7 proficiency contributes to professional practice and guidance to others, level 8 proficiency proposes new ideas and processes to a particular discipline.

Table 3 – *DigComp 2.1 Proficiency Levels and features* (source: adapted from Carretero Gomez *et al.*, 2017)

DigComp Proficiency Levels	DigComp 2.1 Proficiency Levels	Complexity of Tasks	Autonomy	Cognitive Domain
Foundation	1	Simple	With guidance	Remembering
	2	Simple	Autonomy and guidance where needed	Remembering
Intermediate	3	Well defined and routine tasks, and straight forward problems	On my own	Understanding
	4	Tasks, and well defined and non-routine problems	Independent and according to my needs	Understanding
Advanced	5	Different tasks and problems	Guiding others	Applying
	6	Most appropriate tasks	Able to adapt to others in a complex context	Evaluating
Highly specialized	7	Resolve complex problems with limited solutions	Integrate to contribute to the professional practice and to guide others	Creating
	8	Resolve complex problems with many interacting factors	Propose new ideas and processes of the field	Creating

3.4 – *Digital Competency 2.2*

Vuorikari et al. (2022) developed the integrated DigComp 2.2 framework, which featured more than two hundred and fifty new examples of skills, knowledge and attitudes that assist citizens in engaging critically, confidently, and safely with digital technologies and new as well as emerging ones such as systems driven by the artificial intelligence. Besides, the framework was

updated with the recognition of digital accessibility guidelines, addressing the green and sustainability aspects of digital technologies interactions in an open and interactive validation process with international stakeholders such as International Labour Organisation. The measures of knowledge, skills and attitude available in the integrated DigComp 2.2 framework are relevant to be tested with employers to know which apply to specific jobs for recruitment, retention, and promotion.

4 – Employability

Pool (2017) defined employability as a set of talents, experiences, thoughtfulness and personal characteristics that distinguish an individual or make that individual more likely to choose and secure a job in which they can be fulfilled successfully. Employment comes in self-employed, employed to be assigned internally or externally for small or medium enterprises or large companies.

4.1 – *Employability Framework*

Green (2017) maintained some features of the employability framework initially developed by McQuaid and Lindsay in 2005. Individual factors, personal circumstances, and external factors were sustained as essential factors for the demand and supply of employability in the conceptual framework in Figure 1.

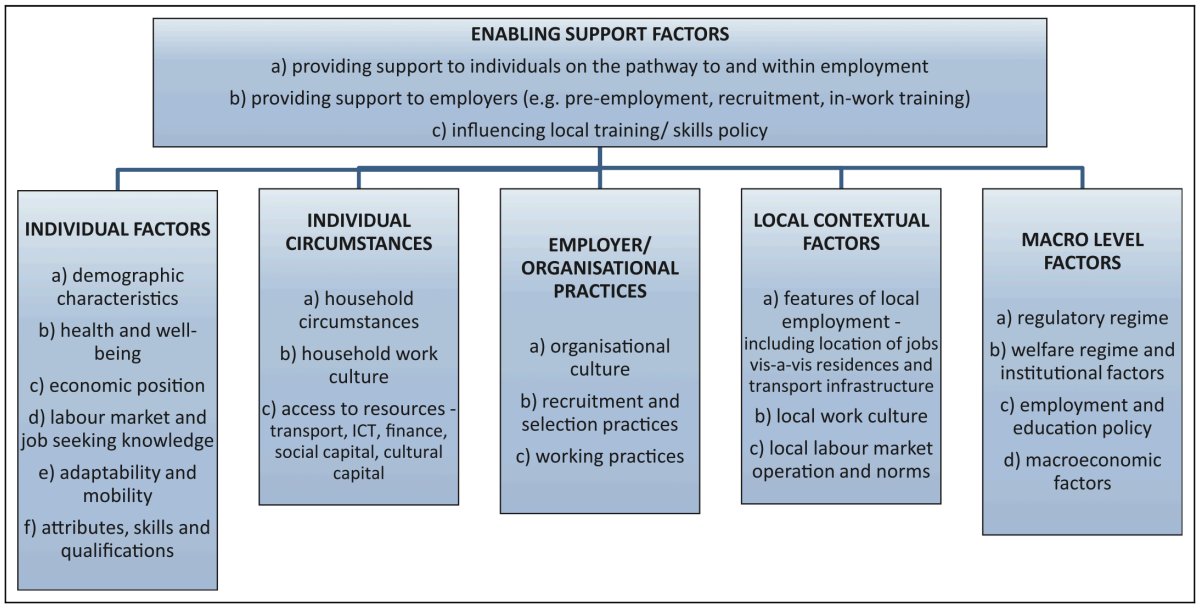

Figure 1 – Employability Framework (*Source*. Green, 2017, p. 1643)

4.2 – *Relations of Digital Competence and Employability*

Macro-level factors, local market operations, employer working practices, and the availability of employees with the requisite attributes, skills, and qualifications likely influence the adoption of ICTs in an organization. A conceptual framework developed by McIntosh and Vignoles (2001) considered the association between computer skills, communication skills, internet skills and advance digital skills as a dependent variable and employability as the independent

variable. Khan et al. (2021) outlined the possible abilities required for an individual to be digitally competent in the conceptual framework, as in Figure 2.

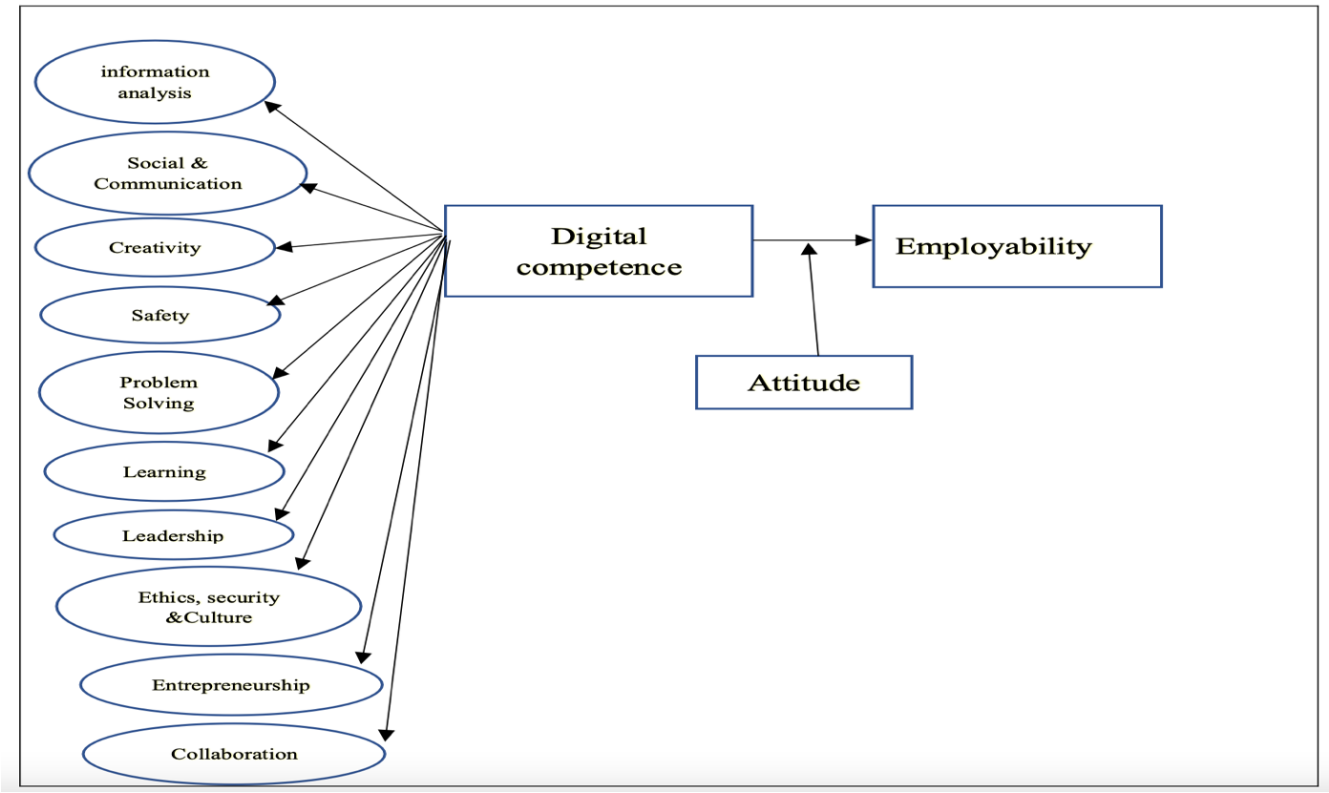

Figure 2 – Framework to Developing Digital Competency Model towards Industry 4.0
(source: Khan et al., 2021, p. 6)

Note. Khan and others (2021) developed the conceptual framework for the relationship between digital competency and employability in Malaysia.

The model posited that digital competency is related directly to collaboration, entrepreneurship, ethics, security and culture, leadership, learning, problem solving, safety, creativity, social and communication, and information analysis. Also, digital competence is related to employability with attitude as a moderator. The hypothesis from the framework pertaining to digital competency and employability states:

H1: DIGITAL COMPETENCY HAS A POSITIVE RELATIONSHIP WITH EMPLOYABILITY

H2: ATTITUDE MODERATES THE RELATIONSHIP BETWEEN DIGITAL COMPETENCY AND EMPLOYABILITY

5 – Discussion

The EC invested in developing and updating the digital competency framework relevant to employability. The framework maintained the initial five dimensions as it evolved to become DigComp 2.2. The dimensions of the framework and features are summarized in Table 4.

5.2 – *Relating DigComp 2.2 Dimensions to Employability*

Ferrari grouped the five competency areas into those for specific activities and the two crosscutting. As a standalone competency area, problem solving is contributed to by the other

competency areas. Businesses aim to gain market share by identifying and satisfying the demand of the market. In essence, problem solving competency area could be relevant to every employer. However, the required descriptors of the other competency areas may differ for various sectors. Information and data literacy may be necessary for the financial industry, but digital content creation may be prioritized for the entertainment sector. Communication and collaboration, as well as safety, are competence areas that every business adopting the use of ICTs may require, even though the prioritized descriptors and the category of employees could differ in an organization or according to the peculiarities of an economic sector.

Table 4 – Dimensions and Features of "DigComp 2.2"

Dimension	Name of Dimension	Features of the Dimensions
1	**Competency area**	The five competency areas were modified in DigComp 2.0 to become: Information and digital literacy, Communication and collaboration, Digital content creation, Safety, and Problem solving. DigComp 2.2 maintains the same areas.
2	**Competence title and description**	The competence titles and descriptors for each area were dominantly amended in DigComp 2.0 and maintained in DigComp 2.2.
3	**Proficiency levels**	DigComp 2.1 partitioned each of the initial three levels into two. Besides, there was an extension of the advanced level by two other levels to become eight proficiency levels. The eight levels were maintained in DigComp 2.2. The proficiency levels were assessed and categorized on autonomy, cognitive domain and complexity of tasks.
4	**Examples of knowledge, skills and attitude**	The examples of attitude, knowledge, and skills are separate groups for each competence descriptor.
5	**Application to purpose**	The application for learning and employment were separately grouped for each competence descriptor.

5.3 – *Dimension 2 on Competency Descriptors*

Generally, the descriptors for each competency area are descriptive for employers to adopt rather than prescriptive for adaptation. The descriptors required for administrative staff could be different from maintenance staff in the same organization. Similarly, a prioritized competency area with associated descriptors is likely to differ for each economic sector. Employers in each industry can therefore situate the required descriptors expected of their employees for each competency area.

5.4 – *Dimension 3 on Proficiency*

The proficiency levels of employees for organizations would depend on the operational requirements of using ICTs to be sustainable or gain a competitive advantage. The intermediate proficiency level 3 with autonomy and understanding to undertake straightforward tasks could

be the minimum preferred by employers. However, employers are likely to headhunt or retain and promote employees with advanced or highly specialized proficiencies for effective and efficient organizational accomplishments.

5.5 – *Dimension 4 on Knowledge, Skills, and Attitude*

Vuorikari and others explained that knowledge is a collection of facts, practices, principles and theories related to a particular duty or study. DigComp2.2 shares that knowledge examples are associated with awareness, familiarity, and understanding of assimilated information through learning. Relatedly, skills are the ability to use knowledge and the means to solve problems and complete tasks cognitively or practically. The examples of skills focus on the ability to do. Attitude is values, priorities and aspirations that facilitate continuous exceptional performance. Attitude is assessed on openness, curiosity, and cost-benefit considerations.

Dimension 4 of DigComp 2.2 comprises digital skills together with knowledge and attitude. Dimension 4 corroborates Garrido and others, who suggested that digital skills require other complementary skills for employability. In support, Khan and others have established that digital competence relates to employability. Consequently, digital skills need knowledge and attitude to gain digital competence. DigComp 2.2 published 260 examples with 102 measures of knowledge, 95 of skills and 63 of attitudes. There were 35 measures related to artificial intelligence; 19 were for knowledge, and eight each were for skills and attitudes.

Furthermore, the four measures for remote working were for skills only in the communication and collaboration competency area. There were 11 measures for digital accessibility; 5 were for knowledge, and three each for skills and attitude. In all instances, knowledge measures dominated skills and attitude.

The measures on artificial intelligence emerged across competency areas from knowledge, skills and attitude. The detailed number of measures was categorized in ANNEX 1 (at the bottom of the paper). Also, the published number of examples of the knowledge, skills, and attitudes of DigComp 2.2 are summarized in Table 5.

Table 5 – ***DigComp 2.2 Dimension 4 summary number of measures***

	Knowledge				**Skills**				**Attitudes**				**Digital Competency Measures**
Total KSA measures	**102**				**95**				**63**				260
Measures with artificial intelligence		**19**				**8**				**8**			35
Measures with remote working			**0**				4				**0**		4
Measures with Digital accessibility				**5**				**3**				**3**	11

6 – Conclusion

The need for digital competencies for employability has evolved in the 21st century as government and private businesses adopt ICTs. As earlier studies posited that digital competence had a limited influence on employability, recent studies have shown that some jobs require graduated levels of digital competence. Attitude has been found as a moderating effect on digital competence to employability. DigComp 2.1 shared measures of autonomy, the complexity of tasks, and the cognitive domain to be tested with employers to establish the required digital competencies for specific jobs or roles. DigComp 2.2 provided measures of attitudes, knowledge, and skills to juxtapose with the proficiencies needed for the labour market. All other competency areas contribute to problem solving, yet the descriptors for each competency area could be different for the various sectors of an economy. Similarly, the required proficiency level for each descriptor could depend on a particular industry influenced by internal and external factors. The measures of knowledge were more than for skills and attitude in all categories of dimension 4 of the DigComp 2.2. Remote working measures are limited to communication and collaboration competency area. However, there are significant measures for artificial intelligence across competency areas from knowledge, skills and attitude. This study is a baseline for further studies targeting employers from the various sectors of the economy in countries to seek the required digital competencies for employment.

7 – Further Studies

The required digital competencies for employees in organizations could differ depending on their roles. Similarly, the various sectors of an economy may have different prioritization and needs for digital competencies. The relevance of identified digital competencies measures for employee recruitment, retention, and promotion could be tested by targeting employers in further studies. Employers for specific economic sectors are best placed to indicate for competency areas the required autonomy of digital competence and the abilities for the complexity of tasks.

Also, there is a need for further studies juxtaposing DigComp 2.2 to update Green's employability framework. Moreover, country case studies on DigComp 2.2 could contribute to a universally subscribed digital competency framework. Furthermore, DigComp 2.2 considers knowledge, skills and attitude as independent variables leading to digital competency. The viability of attitude as a moderator between digital competency and employability could be tested and compared with the conceptual framework by Khan and others.

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ANNEX 1 - DIGCOMP 2.2 DIMENSION 4 DETAILED NUMBER OF MEASURES

Information and data literacy	Knowledge Measures				Skills Measures				Attitudes Measures				**Competency area total measures**
		AI	**RW**	**DA**		**AI**	**RW**	**DA**		**AI**	**RW**	**DA**	
1.1 Browsing, searching and filtering data, information and digital content	5	2	0	0	6	1	0	0	5	1	0	1	
1.2 Evaluating data, information and digital content	7	3	0	0	5	1	0	0	3	0	0	0	
1.3 Managing data, information and digital content	5	1	0	0	5	0	0	0	2	0	0	0	
Total Competency Measures	**17**	**6**	**0**	**0**	**16**	**2**	**0**	**0**	**10**	**1**	**0**	**1**	**43**
Communication and collaboration	Knowledge Measures				Skills Measures				Attitudes Measures				
		AI	**RW**	**DA**		**AI**	**RW**	**DA**		**AI**	**RW**	**DA**	
2.1 Interacting through digital technologies	4	0	0	1	6	2	2	0	3	1	0	0	
2.2 Sharing through digital technologies	2	1	0	0	6	0	1	0	3	0	0	0	
2.3 Engaging in citizenship through digital technologies	7	3	0	0	4	1	0	0	4	1	0	0	
2.4 Collaborating through digital technologies	2	0	0	0	5	0	1	0	3	0	0	1	
2.5 Netiquette	5	0	0	1	4	0	0	0	3	0	0	0	
2.6 Managing digital identity	4	1	0	0	6	1	0	0	4	1	0	0	
Total Competency Measures	**24**	**5**	**0**	**2**	**31**	**4**	**4**	**0**	**20**	**3**	**0**	**1**	**75**
Digital content creation	Knowledge Measures				Skills Measures				Attitudes Measures				
		AI	**RW**	**DA**		**AI**	**RW**	**DA**		**AI**	**RW**	**DA**	
3.1 Developing digital content	4	*1*	0	1	5	0	0	1	3	0	0	1	
3.2 Integrating and re-elaborating digital content	1	0	0	0	4	1	0	1	3	0	0	0	
3.3 Copyright and licences	6	0	0	0	5	0	0	0	2	0	0	0	
3.4 Programming	9	0	0	0	4	0	0	0	2	1	0	0	
Total Competency Measures	**20**	**1**	**0**	**1**	**18**	**1**	**0**	**2**	**10**	**1**	**0**	**1**	**48**
Safety	Knowledge Measures				Skills Measures				Attitudes Measures				
		AI	**RW**	**DA**		**AI**	**RW**	**DA**		**AI**	**RW**	**DA**	
4.1 Protecting devices	5	0	0	0	6	0	0	0	3	0	0	0	
4.2 Protecting personal data and privacy	3	1	0	0	4	0	0	0	2	0	0	0	
4.3 Protecting health and well-being	8	0	0	0	3	0	0	0	3	0	0	0	
4.4 Protecting the environment	7	1	0	0	3	0	0	0	4	1	0	0	
Total Competency Measures	**23**	**2**	**0**	**0**	**16**	**0**	**0**	**0**	**12**	**1**	**0**	**0**	**51**
Problem solving	Knowledge Measures				Skills Measures				Attitudes Measures				
		AI	**RW**	**DA**		**AI**	**RW**	**DA**		**AI**	**RW**	**DA**	
5.1 Solving technical problems	5	1	0	0	4	0	0	0	1	0	0	0	
5.2 Identifying needs and technological responses	5	3	0	2	3	1	0	1	2	0	0	0	
5.3 Creatively using digital technologies	3	0	0	0	4	0	0	0	3	1	0	0	
5.4 Identifying digital competence gaps	5	1	0	0	3	0	0	0	5	1	0	0	
Total Competency Measures	**18**	**5**	**0**	**2**	**14**	**1**	**0**	**1**	**11**	**2**	**0**	**0**	**43**