

**SHAPING THE NETWORK COMPETENCES OF YOUNG GIRLS
FROM MINOR TOWNS AND RESTRUCTURED AREAS AS FUTURE
BUSINESS LEADERS OPERATING IN A 4.0 ECONOMY**

TEACHERS' TOOLKIT

Part 1

*Digital and Network Competences as a Critical Pathway to Empowerment and
Future Professional Success of Young Girls from Disadvantaged Areas*

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1. Understanding Digital Competence

The European Commission (2018) describes **digital competence** as involving "the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society." While UNICEF (2018) defines **digital literacy** as "the set of knowledge, skills, attitudes, and values that enable children to confidently and autonomously play, learn, socialize, prepare for work and participate in civic action in digital environments." Worth noting here is that both terms "digital competence" and "digital literacy" refer to the same concept (McGarr et al., 2021; Pöntinen and Rätty-Záborszky, 2020). The use of the term "literacy" or "competence" is dependent upon geographical region: "digital competence" is used in Nordic countries and in continental Europe (Norwegian/Spanish: digital kompetanse/competencia digital), whereas "digital literacy" tends to be used more in anglophone countries (Spante et al., 2018).

Digital Competence refers to a broader set of abilities that include knowledge, skills, and attitudes needed to use digital technologies effectively, safely, and responsibly. Competence goes beyond technical skills and also includes problem-solving, critical thinking, and ethical considerations. They emphasize how and why digital tools are used rather than just the ability to use them (for example, understanding how to evaluate online sources for credibility, protecting personal data, or using digital tools for collaboration).

Digital knowledge refers to theoretical understanding and awareness of digital concepts, technologies, and trends. It involves knowing what digital tools exist, how they function, and their societal impact (for example, understanding how AI works, knowledge of internet privacy laws, or awareness of the risks of social media).

Digital skills are the practical abilities required to operate digital devices and software. They focus on what a person can do with technology. Digital skills range from basic (e.g., sending an email) to advanced (e.g., programming or cybersecurity analysis) (for example, using word processors, managing spreadsheets, creating digital presentations).

TO CONCLUDE, competence [literacy] is the whole of knowledge, skills, and attitudes that allow one to deal with the complex, changing and mediatized world in a conscious and critical way. It is the ability to use ICT in an active and creative way, aimed at societal participation.

2. The European Digital Competence Framework for Citizens (DigComp)

Over the years, many digital competence frameworks, models, and skills have been developed. For the purposes of this project, the DigComp and the DigCompEdu have been used as the working frameworks. The European Digital Competence Framework for Citizens (DigComp) provides a common understanding of what digital competence is. Basing on a review of other 15 well-known digital competence frameworks the DigComp framework, was developed by Ferrari, updated by Vuorikari and colleagues (DigComp 2.0) (Carretero et al., 2017).

The DigComp framework includes five areas of digital skills (Figure 1).

INFORMAT ION AND DATA LITERACY	COMMUNI CATION AND COLLABORATION	CONTENT CREATION	SAFETY	PROBLEM SOLVING
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Figure 1. Five areas of digital skills (based on DigComp framework)

Source: Carretero, S., R. Vuorikari, and Y. Punie. 2017. DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, EUR 28558 EN, doi:10.2760/38842.

According to DigComp, the *information knowledge* area includes the competencies of browsing, searching and filtering digital information, and evaluating, storing and retrieving it. Becoming a skillful accessor refers to gathering (identifying, locating) and using quality resources. The efficient operation in digital information environment is important due to a challenge to consumers of navigating of the large quantity of information exposed online. Using relevant, reliable, and authoritative resources gathered and shared in a variety of media content helps to meet the information needs. Besides, relevant, reliable information is needed to make an informed decision. Analyzing skills refers to critically questioning the information which is seen, heard and used. Enabling the development of criticizing and questioning skills encourages one to think critically about media representations, and to move away from oppressive and knowledge transfer-based approaches. Critical thinking and understanding are required to distinguish and decode reality, predominant values, ideologies, and gender representations that are constructed by the media. Critical thinking and questioning are at the heart of critical media literacy (Aydemir and Demirkan, 2021). The concept of critical media information literacy supports efforts to unmask biases, hidden agendas, and the economic structures of media representation and information (Friesem, 2019, 189). Furthermore, critical data literacy encompasses the ability to use the media as a tool for social transformation, beyond critical text analysis, leading to the teaching of conscious effort towards the improvement of equality and justice, as well as to the creation of a better society (Kellner and Share, 2007 (cited in Aydemir and Demirkan, 2021).

Communication and collaboration is a core dimension of digital competence in the DigComp framework; it covers different activities such as interacting through technologies, sharing information and content, collaborating through digital channels, managing digital identity and netiquette. Digitally competent person should be aware of each digital tool's advantages and drawbacks to ensure that their adoption in the asynchronous and synchronous communicative process is beneficial (Zhu and Andersen, 2022). Different digital tools have specific strengths and limitations for communicative purposes. For instance, SMS and written messages are more beneficial for tasks such as 'delivering and requiring simple information', 'checking updates', and 'making an appointment'; they give both communicative partners flexibility to write their response whenever and wherever they prefer. By contrast, telephone and video conferences are

often used to clarify complicated situations or other activities requiring both communicative partners to provide instant feedback. Besides, asynchronous and synchronous digital communication can require different communicative strategies for engagement (Zhu and Andersen, 2022). In asynchronous messages, communicator can use well-constructed questions with long sentences and phrases to prompt partners to reflect on in-depth and complex issues; partners may take minutes, hours, or even days to respond. In synchronous messages, by contrast, communicators might use ‘short sentences and phrases’ and ‘messages that are right to the point’ to facilitate instant response and quick information exchange (Zhu and Andersen, 2022). In addition, communicative techniques, writing skills and netiquette are essential in cyber communication. For example, like a face-to-face consultation, cyber communication also requires forming reflective text messages or questions to encourage communicative partners to ‘think critically and examine their situation independently’.

Content creation in the DigComp framework refers to the ability to create and edit new digital content, integrate and re-elaborate previous content, produce creative expressions, media outputs and programming, and deal with and apply intellectual property rights and licenses. Creating skills in the context of media literacy education refers to being responsible message creator and taking action to use the power of communication and information for social good (Hobbs et al., 2022). Digital content creation should focus on skills in using innovative tools such as social media and digital storytelling to create multimedia and multi-sensual content, which is more personalized, emotional, and powerful in delivering messages (Zhu and Andersen, 2022). It was also further proposed to add a social-emotional component, i.e. skills related to observing and applying “netiquette” which refers to using appropriate language online (De Leyn et al., 2022, 223). Learning to create own media message is an important step “toward developing interpretive proficiency in a post-truth era” (Friesem, 219, 188).

Safety knowledge includes knowledge about personal protection, data protection, digital identity protection, security measures and safe and sustainable use of technologies. Becoming a critical evaluator of media encompasses the ability to determine **which** information is reliable and **which** is not; and how signs of trustworthiness or credibility cues are exploited (Jacub et al., 2020). It is in line with the attempt to combat the growing tendency for some producers to systematically produce information that is false, while making those online artefacts appear trustworthy (Jacub et al., 2020). It is especially important to improve the skills of media consumers to identify false information in the era of “fake news phenomena” (Jacub et al., 2020). Being **a** responsible message consumer encompasses understanding the political, social, and economic contexts in which media messages influence individuals and societies (Hobbs et al., 2022).

Problem-solving in DigComp framework means a capacity to solve technical problems **and** identify digital needs and resources, creatively use technology, identify digital competence gaps and update one’s own and others’ competence (Carretero, Vuorikari, and Punie 2017). Problem-solving knowledge and skills can fall into four categories: 1) the ability to master particular digital tools; 2) knowledge about different digital tools’ limitations and possibilities in practice; 3) the ability to critically reflect on digital framework conditions for professional practice; and 4) the ability to use digital tools for knowledge building and for the development of new service and practice (Zhu and Andersen, 2022).

TO CONCLUDE, [...] the term “digital and media literacy” is used to encompass the full range of cognitive, emotional and social competencies that includes the use of texts, tools and

technologies; the skills of critical thinking and analysis; the practice of message composition and creativity; the ability to engage in reflection and ethical thinking; as well as active participation through teamwork and collaboration.

3. European Framework for the Digital Competence of Educators (DigCompEdu)

Teachers' digital competence and their beliefs regarding their ability to use information and communication technologies (ICT) are important for the successful integration of digital tools into educational practices. This confidence, often referred to as ICT self-efficacy, is a critical factor in the effective incorporation of technology into learning environments. Research by Rubach and Lazarides (2021) indicates a strong correlation between teachers' self-perceived competence in digital domains and their actual implementation of ICT in classroom activities. When teachers have this confidence, they are more likely to use digital tools in ways that enhance student engagement, personalised learning, and collaborative opportunities.

The DigCompEdu Framework distinguishes educator-specific digital competences by describing 22 elementary competences organized in 6 areas (Table 1). For the purposes of this project, area 3-6 are under consideration. The competences listed in these areas detail how to make efficient and innovative use of digital technologies when implementing (area 3), assessing (area 4) teaching and learning. Area 5 acknowledges the potential of digital technologies for learner-centred teaching and learning strategies. Area 6 details the specific pedagogic competences required to facilitate students' digital competence.

To emphasize the pedagogical dimension within DigCompEdu framework Facilitating Learners' Digital Competence (DigCompEdu) encompasses 5 main aims:

- To incorporate learning activities, assignments and assessments which require learners to articulate information needs; to find information and resources in digital environments; to organize, process, analyze and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources [Information and media literacy]
- To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation [Digital communication and collaboration]
- To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses [Digital content creation]

Table 1. The DigCompEdu framework

PROFES SIONAL ENGAGEMENT	DIGITA L RESOURCES	TEACH ING AND LEARNING	EMPO WERING LEARNERS	EMPO WERING LEARNERS	FACILIT ATING LEARNERS' DIGITAL COMPETENCE
Using digital technologies for communication, collaboration and professional development	Sourcing, creating and sharing digital resources	Managing and orchestrating the use of digital technologies in teaching and learning	Using digital technologies and strategies to enhance assessment	Using digital technologies to enhance inclusion, personalisation and learners' active engagement	Enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing and problem-solving.

Source: Punie, Y., editor(s), Redecker, C., European Framework for the Digital Competence of Educators: DigCompEdu , EUR 28775 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73718-3 (print),978-92-79-73494-6 (pdf), doi:10.2760/178382 (print),10.2760/159770 (online), JRC107466.

- To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly [Responsible use]
- To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations [Digital problem solving]

The DigCompEdu Framework also provides a list of typical activities which illustrates the focus and scope of the competence, without delimiting it (Table 2). Activities to improve digital competence vary in accordance to subjects, and additional specific aims. However, common features of digital competence curriculum are attempts through observation, problem-solving, critical thinking, creative thinking and communication.

TO CONCLUDE, fostering students' digital literacy and skills cannot happen in isolation. It begins with ensuring that teachers themselves are digitally competent. Educators must possess a well-rounded understanding of the components of digital competence—including not only skills, but also knowledge, and attitudes. The competence must be applicable across various domains of life and work: from the classroom to the workplace, and from personal communication to civic engagement.

Table 2. Activities to Facilitating Learners' Digital Competence

Areas	Information and media literacy	<ul style="list-style-type: none"> - To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. -To create and update personal search strategies. - To adapt search strategies based on the quality of information found. -To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. -To organise, store and retrieve data, information and content in digital environments. -To organise and process information in a structured environment.
	Digital communication and collaboration	<ul style="list-style-type: none"> -To interact through a variety of digital technologies. -To understand appropriate digital communication means for a given context. -To share data, information and digital content with others through appropriate digital technologies. -To know about referencing and attribution practices. -To participate in society through the use of public and private digital services. -To seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies. -To use digital technologies for collaborative processes, and for co-construction and co creation of resources and knowledge. -To be aware of behavioural norms and know how while using digital technologies and interacting in digital environments. -To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments -To create and manage one or multiple digital identities. -To protect one's own reputation. - To deal with the data that one produces through several digital technologies, environments and services.
	Digital content creation	<ul style="list-style-type: none"> -To create and edit digital content in different formats. - To express themselves through digital means. - To create new, original and relevant content and knowledge. - To understand how copyright and licenses apply to data, information and digital content. - To modify, refine, improve and integrate information and content into an existing body of knowledge. -To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task

	<p>Responsible use</p>	<ul style="list-style-type: none"> -To protect devices and digital content, and to understand risks and threats in digital environments. - To understand safety and security measures. - To protect personal data and privacy in digital environments. - To understand how to use and share personal information while being able to protect oneself and others from damages. - To understand that digital services use a “Privacy policy” on how personal data is used. - To avoid health risks and threats to physical and psychological well-being while using digital technologies. - To protect oneself and others from possible dangers in digital environments (e.g. cyberbullying). - To be aware of digital technologies for social wellbeing and social inclusion. - To be aware of the environmental impact of digital technologies and their use. - To monitor student behaviour in digital environments in order to safeguard their wellbeing. - To react immediately and effectively when learners’ wellbeing is threatened in digital environments (e.g. cyberbullying).
	<p>Digital problem solving</p>	<ul style="list-style-type: none"> -To identify technical problems when operating devices and using digital environments, and to solve them. - To adjust and customise digital environments to personal needs. - To use digital technologies in innovative ways to create knowledge. - To understand where their digital competence needs to be improved or updated. - To support others in their digital competence development. - To seek opportunities for self-development and to keep up-to-date with the digital evolution. - To identify, evaluate, select and use digital technologies and possible technological responses to solve a given task or problem

Source: Punie, Y., editor(s), Redecker, C., European Framework for the Digital Competence of Educators: DigCompEdu , EUR 28775 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73718-3 (print),978-92-79-73494-6 (pdf), doi:10.2760/178382 (print),10.2760/159770 (online), JRC107466.

4. Digital competence in the Social and Educational Life of Teenagers

The development of digital competence is crucial for many reasons. Digital competence enables students to use technology for learning, communication, and problem-solving. Technology can help provide interactive and engaging learning materials that increase student engagement and motivation. The use of technology in education can improve learning quality and provide more attractive and interactive learning materials. Contrary, low digital competence can lead to burnout and deterioration in mental health with a potential drop in performance (He et al., 2024).

Digital competence also contributes to better learning outcomes. In addition, digital competence allows students to conduct research more effectively, access a wider range of resources, and collaborate with peers on digital platforms (He et al., 2024).

Digital communication channels are necessary for participation in public life, access to information, and interaction with other people (Vuorikari et al., 2022). Students with digital skills more easily participate in public life and make reasonable decisions in the digital world.

Digital competence is a necessary skill in the modern world, where technology penetrates all aspects of life. Students with digital skills are better prepared for a future job market that requires digital skills regardless of the industry (López-Meneses et al., 2020).

Moreover, the inclusion of digital competence contributes to reducing the digital divide, since students of a lower socio-economic position may have less access to technology outside of school (Muñoz-Repiso et al., 2020). Receiving digital education at school, students of all social strata will have the opportunity to develop digital skills and reduce digital inequality.

5. Digital and Network Competencies as Catalysts for Empowering Young Girls from Disadvantaged Areas

The accelerating virtualisation of socio-economic life, driven by digital transformation, has redefined the skills necessary for meaningful participation in the workforce and civic society. For young girls aged 13–18 in post-industrial or restructured regions and minor towns—areas often marked by economic decline, limited opportunity, and digital marginalization - the cultivation of digital competences, especially network competences, represents a critical pathway to empowerment and future professional success.

Digital competences encompass a broad spectrum of skills, from basic digital literacy to advanced abilities such as data analysis, cybersecurity awareness, and content creation. Within this framework, network competences refer specifically to the ability to build, manage, and leverage digital social and professional networks. These include skills in online communication, collaboration, self-presentation, and navigating digital communities and platforms. For young individuals, particularly girls in disadvantaged areas, these competences are not only tools for personal development but also strategic assets for mobility and influence.

In post-industrial and minor-town contexts, structural limitations such as underfunded education systems, lack of local role models, and low labor market dynamism constrain young girls' future trajectories. However, digital tools and networks can mitigate these constraints by enabling access to information, mentorship, and communities beyond local geographies. Through

online platforms, girls can participate in coding bootcamps, virtual internships, and global youth forums—opportunities that foster both competence and confidence.

Network competences also support the development of what social theorists describe as bridging capital—connections that extend beyond one’s immediate social circle and open up new cultural and economic resources. As girls become adept at navigating digital spaces, they can form translocal peer groups and professional networks, positioning themselves as active agents of their own futures.

Importantly, digital and network competences do more than enhance employability; they also cultivate leadership and civic agency. Girls who can articulate their voices online, coordinate digital campaigns, or participate in virtual co-creation projects are well positioned to act as change agents in their communities. By embodying new forms of leadership that blend technical skill with social awareness, they can challenge traditional gender norms, inspire peers, and advocate for structural improvements in their regions.

Moreover, as economies increasingly rely on virtual collaboration, AI, and platform-based business models, digital-savvy individuals will be crucial to regional revitalisation efforts. Girls equipped with network competences can contribute to the creation of local digital ecosystems—startups, co-working hubs, digital services—that help reimagine post-industrial areas as spaces of innovation rather than decline.

In sum, digital and especially network competences are foundational for preparing young girls in post-industrial and minor-town environments to navigate and shape a virtualized world. These competences act as enablers of professional advancement and as tools for social leadership. Investing in the development of such skills—through inclusive education policies, targeted mentorship programs, and community-based digital initiatives—can transform young girls not only into future professionals but into agents of lasting socio-economic change.

References

Aydemir, S., and Demirkan, O. (2021). Gender and media literacy training: a curricular experience with pre-service teachers. *Educational Studies*, DOI: 10.1080/03055698.2021.1994375

Carretero, S., Vuorikari, R., and Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, EUR 28558 EN, doi:10.2760/38842.

De Leyn, T., Waeterloos, C., De Wolf, R., Vanhaelewyn, B., Ponnet, K., and De Marez, L. (2022) Teenagers’ reflections on media literacy initiatives at school and everyday media literacy discourses, *Journal of Children and Media*, 16:2, 221-239, DOI: 10.1080/17482798.2021.1952463

Friesem, Y. (2019). Teaching Truth, Lies, and Accuracy in the Digital Age: Media Literacy as Project-Based Learning. *Journalism & Mass Communication Educator*, 74 (2), 185-198.

He,Z., Xuyuan Chen, X., and Guo, Sh. (2024) Digital competence and its components in basic education, *Interactive Learning Environments*, 32:9, 5174-5185, DOI: 10.1080/10494820.2023.2211636

Hobbs, R., Moen, M., Tang, R., and Steager, P. (2022) Measuring the implementation of media literacy statewide: a validation study. *Educational Media International*, 59:3, 189-208, DOI: 10.1080/09523987.2022.2136083

- López-Meneses, E., Sirignano, F. M., Vázquez-Cano, E., & Ramírez-Hurtado, J. M. (2020). University students' digital competence in three areas of the DigCom 2.1 model: A comparative study at three European universities. *Australasian Journal of Educational Technology*, 36(3), 69–88. <https://doi.org/10.14742/ajet.5583>
- McGarr, O., Mifsud, L., and Rubio, J. C. (2021) Digital competence in teacher education: comparing national policies in Norway, Ireland and Spain. *Learning, Media and Technology*, 46 (4), 483-497.
- Muñoz-Repiso, A. G. V., Casillas Martín, S., & Basilotta Gómez-Pablos, V. (2020). Validation of an indicator model (INCODIES) for assessing student digital competence in basic education. *Journal of New Approaches in Educational Research*, 9(1), 110–125. <https://doi.org/10.7821/naer.2020.1.459>
- Pöntinen S., and Rätty-Záborszky, S. (2020) Pedagogical aspects to support students' evolving digital competence at school. *European Early Childhood Education Research Journal*, 28 (2), 182-196. DOI: 10.1080/1350293X.2020.1735736
- Punie, Y., editor(s), Redecker, C., European Framework for the Digital Competence of Educators: DigCompEdu , EUR 28775 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73718-3 (print),978-92-79-73494-6 (pdf), doi:10.2760/178382 (print),10.2760/159770 (online), JRC107466.
- Rubach, C., Lazarides, R. (2021). Addressing 21st-century digital skills in schools – Development and validation of an instrument to measure teachers' basic ICT competence beliefs, *Computers in Human Behavior*, 118, 106636, <https://doi.org/10.1016/j.chb.2020.106636>.
- Spante, M., Sofkova Hashemi, S., Lundin, M., and Algers, A. (2018) Digital Competence and Digital Literacy in Higher Education Research: Systematic Review of Concept Use. *Cogent Education*, 5 (1): 1–21.
- Vuorikari, R., Kluzer, S., and Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens - with new examples of knowledge, skills and attitudes. Publications Office of the European Union. <https://doi.org/10.2760/115376>
- Yakub, G.; Knight, S., Kitto, K., and Fray P. (2020) The absence of a media literacy toolbox: working towards an evaluation tool, *Communication Research and Practice*, 6:3, 259-276, DOI: 10.1080/22041451.2020.1802844
- Zhu, H., and Andersen, S.T. (2022) Digital competence in social work practice and education: experiences from Norway, *Nordic Social Work Research*, 12:5, 823-838, DOI: 10.1080/2156857X.2021.1899967