Digital Skills

A Necessity in the New Informational and Communication Context

Elena Tîrziman
Prof. Dr.
University of Bucharest, Faculty of Letters
Email elena.tirziman@litere.unibuc.ro
Maria Micle
Conf. dr.
West University of Timisoara, Faculty of Political and Communication Sciences
Email maria.micle@e-uvt.ro
Angela Repanovici
Prof. Dr.
Transilvania University of Brasov, Faculty of Product Design and Environment
Email arepanovici@unitbv.ro

Abstract:
The complexity of the digital environment, as an information and communication environment, determines changes in the information and communication behaviour of users, in the context of the social, cultural, educational, economic activities carried out, leading to new paradigms in the field of information, documentation and research and essentially changing contemporary society in all its components.
Digital skills are essential in contemporary society, substantially influencing the educational process. It is crucial that individuals, educational institutions and organizations work together to develop these skills, thus ensuring a society better prepared for the challenges of the future. Investigating the university environment in Romania, respectively the opinions of undergraduate and master's students, we note that they prefer to use electronic resources for study and equally strongly feel (78,4%) the need to train to use digital tools and resources.

Keywords*: digital education, digital competences, information literacy*

1. Introduction

The digital environment, seen as a new informational and communication context, modifies traditional social, cultural, and psychological models. To notice that, especially after the pandemic experience, it has become more concrete, offering mobility, and significantly detaching the dependence of communication activities on physical space(Sala 2023 p. 24).

In an increasingly digitized world, digital skills have become essential for an effective adaptation in contemporary society, along with those related to multilingualism, citizenship, entrepreneurship, literacy in new fields, etc.(Directorate-General for Education 2019) Digital skills

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

are not only limited to the use of technology: they also include specific communication, critical thinking, and collaboration skills. Rejection of the digital environment or the refusal to use databases or digital applications is not justified unless it is caused by insufficient understanding and recognition of the trends of contemporary society therefore, education on the use of information and communication technologies becomes a mandatory part of contemporary educational strategies.

The evolution of society from information society to digital society determined a new relationship of each person with information and technology. Digital society does not mean only information and technology, but an integrative approach of the two components in digital constructions that reproduce and transpose the socio-economic and cultural environment in which people live. Therefore, integration into the digital society is a complex approach that requires the acquisition of appropriate digital skills, along with a psycho-cognitive, social, and cultural approach that helps assimilate these new models of social representation. Equally, looking in perspective, all other knowledge necessary for life in society must be transmitted, at the same time, from sciences to arts, ethics, and ecology. Jaques Attali appreciates that "even if infinite databases will make memory seem useless, even if it will practically no longer be necessary to acquire knowledge, because everything will be available in virtual libraries, practising memory will remain a primordial activity for people to know where to look for this data and how to associate it. A society based only on the contents of its libraries would be dead without knowing it (Attali 2024 p. 316)."

2. Definition of Digital Skills

This theoretical article aims to explore the area of digital skills – definition, importance, and the ways in which they can be developed.

Digital competences refer to the set of knowledge, skills, and attitudes required to use digital technology effectively and responsibly. According to the European Digital Competence Framework(Joint Research Centre (European Commission) *et al.* 2022), digital skills include:

- Information and data: the ability to search, evaluate and manage information.
- Communication: the ability to interact and collaborate with others through digital technologies.
- Content creation: the ability to develop and edit digital content.
- Safety: understanding online safety and data protection issues.
- Problem Solving: the ability to use technology to solve problems and make informed decisions.

Acquiring digital skills has become a necessity for everybody, a mandatory condition to be present in the digital space and to use the digital products and services made available in this new environment of communication and interaction. Digital skills are considered the "new normal," characterized by the widespread use of digital technologies that enable people of all ages, social classes, and educational levels to use the skills acquired through digital literacy to learn, work, inform, and stay connected with family, friends, and other members of the community, no matter the geographical area or locality they are located in (Buchholz *et al.* 2020).

Digital literacy or digital culture takes various forms of varying complexity, depending on the needs of the applicants and on the objectives set as level and content of acquiring theoretical knowledge and practical skills regarding the digital environment and everything it means in terms

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

of existing technologies and applications, digital content, and the forms and levels of interaction that people can achieve (Bejan 2022 pp. 105-115).

Thus, three levels/groups of components of digital culture or digital literacy can be distinguished (Yashalova *et al.* 2019):

4. Digital culture for digital consumption (which presupposes theoretical knowledge and digital skills necessary for the online use of information, educational, professional, administrative, cultural, banking, online shopping, social networks, and other digital applications that allow everybody to interact and communicate in the digital space staying only at the user level).
5. Digital culture for digital content creation (which presupposes theoretical knowledge and digital skills necessary for the online use of digital applications and technologies for the creation of digital content in the most diverse formats and for its publication or integration in global networks the evaluation of existing digital content and its use in new contexts of information and communication the interaction on digital content platforms or applications or the use of any computer application that involves the creation, evaluation, processing, or communication of digital content according to the user's decision).
6. Digital culture for digital security (which presupposes theoretical knowledge and digital skills necessary for the online use of applications and technologies that ensure security on the Internet at the network level and at the level of all applications, products and services offered through the protection of personal data by respecting the intellectual property laws and other legal norms by ensuring free or controlled access to data by other forms and ways of ensuring digital security the technologies involve, the digital content, and the presence of the human factor in the digital environment.

2.1. Importance of Digital Skills

1. Integration into the labour market. Digital skills are increasingly sought after by employers. Many jobs require advanced digital skills, and their lack can limit individuals' career opportunities. In addition, developing digital skills can help increase productivity and efficiency at work.
2. Civic and social participation. In a democratic society, digital skills are essential for active participation in the community life. Citizens who master these skills can access relevant information, participate in debates, and contribute to the decision-making process.
3. Education and lifelong learning. Digital skills are fundamental to education, both in formal and informal settings. They facilitate access to educational resources, promoting lifelong learning. Digital skills are also essential for students who need to use technology for research, collaboration, and presentation (Tîrziman 2023 pp. 160-161).

3. Ways to Develop Digital Skills

In the European Commission's report European Framework for the Digital Competence of Educators: DigCompEdu (Redecker 2017), a common European framework is formulated to define the skills needed by citizens and which should be a concern for institutions and individuals involved in educational activities. This Framework Programme for Educators builds on the concerns of European structures to ensure digital skills for all its citizens (Digital Skills Framework Programme DigComp)(Joint Research Centre (European Commission) *et al.* 2022). It is considered that, due to

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

the omnipresence of digital technologies in all areas of social life, it is necessary for pupils and students to be helped to acquire the necessary digital skills and, to do so, it is first necessary for trainers, educators, and teachers to acquire these digital skills. At the international and national level, several theoretical frameworks, self-assessment tools, and training programs have been developed to describe the digital competences needed by trainers and educators so that adequate training is ensured. The European DigCompEdu framework resulted from the analysis and interpretation of these existing national and international tools and programs. The DigCompEdu framework is aimed at educators at all levels of education, from primary to higher education, including general and vocational education, lifelong education, special needs education, and non-formal learning contexts. The DigCompEdu framework starts from the premises that people live in an increasingly complex and highly dynamic digital world in which the environment people live and work in no longer resembles the world of previous generations. People's relationship and communication, banking, commercial, professional, cultural, administrative, and social activities are carried out through specialized applications and platforms and, therefore, diverse digital skills are required. DigCompEdu was developed after an intensive two-year research and consultation process involving over 120 experts and a variety of stakeholders from EU Member States. This European DigCompEdu framework is a scientific attempt to define a common set of skills that people need to thrive in all areas of their lives in a digital context.

Lack of digital skills can have a profound effect on people's overall life chances and employability. The DigComp framework has been supplemented with DigComp at Work, a document that considers digital skills in specific professional activities (Kluzer *et al.* 2020). A study carried out at European level(Directorate-General for Employment, Social Affairs and Inclusion (European Commission) 2016) reveals that around 40% of the EU population has insufficient levels of digital skills and 22% have no digital skills at all (they are often older citizens, less educated young people, lower-income families, or migrants). It is estimated that 32% of the EU workforce has insufficient digital skills and 13% of the registered workforce at European level has no digital skills at all. It is also mentioned that 42% of EU citizens who do not have computer skills are inactive on the labour market in fact, they have minimal chances of professional insertion. For this reason, the European Commission considers it important and supports the development of digital skills for all its citizens.

The European Digital Competence Framework DigComp identifies 21 competences in five key areas, which describe what it means to be digitally experienced. People need to have skills in each of these key areas to achieve the goals related to carrying out professional, administrative, learning, entertainment, and leisure activities, and engaging in social activities in the digital space. Being digitally competent means being able to use diverse digital technologies (including smartphones) in a critical, collaborative, and creative way (Directorate-General for Employment, Social Affairs and Inclusion (European Commission), 2016). The five key areas and related digital skills are presented in the Table 1 below(Directorate-General for Employment, Social Affairs and Inclusion (European Commission) 2016).

Table. 1. Five key areas of DigComp and related digital skills

Training in the use of data and information	Browsing, searching, and filtering data, information, and digital content
	Evaluation of data, information, and digital content
	Management of data, information, and digital content
Communication	Interaction through digital technologies

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

	Sharing digital resources and content through digital technologies
	Involving citizens in social, democratic activities through digital technologies
	Collaboration through digital technologies
	Netlabel
	Digital identity management
Digital Content Creation	Digital content development
	Integration and re-elaboration, re-use of digital content
	Copyright and licenses
	Programming
Security and protection	Protective devices and technologies
	Protection of personal data and privacy
	Protecting health and well-being
	Protecting the environment
Trouble shooting	Solving technical problems
	Identifying technological needs and responses
	Creative use of digital technologies
	Identifying digital skills gaps

Source: The European Digital Competence Framework for Citizens(Directorate-General for Employment, Social Affairs and Inclusion (European Commission) 2016).

DigComp is a theoretical framework that can be used as a common reference tool for all EU countries to ensure digital skills for all European citizens through basic education and lifelong training. DigComp can also be used for self-assessment as it allows people to measure their digital skills and identify gaps in their knowledge, skills, and abilities in the five key areas. The official document(Directorate-General for Employment, Social Affairs and Inclusion (European Commission) 2016) states that DigComp can be used free of charge by public and private sector organizations, i.e., by any institutional structure interested in contributing to the development or improvement of people's digital skills.

DigComp at Work focuses on the ICT profession in the workplace. In addition, the framework supports broader key EU policy objectives, including efforts to boost jobs, growth, and investment creation of a digital single market, and the creation of new jobs. DigComp is also part of the wider EU skills initiative and must be seen as part of European concerns to ensure the right and necessary skills and qualifications for its citizens ('Skills and qualifications - Employment, Social Affairs & Inclusion - European Commission' 2024). The Digital Competence Framework for Citizens was developed by the EU Joint Research Centre on behalf of the Directorate-General for Employment, Social Affairs, and Inclusion.

EU citizens who have digital skills assessed as low can use Dig Comp to identify the knowledge they need to become more active in society. Employers looking for staff can use DigComp to accurately define the skills and qualifications needed to draw up a job description or the requirements for filling a vacancy. DigComp is a guide to learning requirements, which means that it is also a valuable resource for the education and training sector [1].

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

1. 1. Formal education. Educational institutions play a crucial role in developing digital skills. The educational curriculum should integrate digital skills into all subjects, not just technology courses. Teacher training is also essential to ensure a conducive learning environment.
2. 2. Vocational training programs. Companies and organizations can offer lifelong training programs for their employees focused on developing digital skills, including online courses, workshops, and training sessions tailored to the specific needs of employees.
3. 3. Online resources and learning communities. The Internet offers a wealth of learning resources such as online courses, video tutorials, and discussion fora. Participating in online learning communities can foster the development of digital skills and provide support and feedback from other users.
4. 4. Practice and experience. Developing digital skills takes practice. Frequent use of digital technologies in everyday life, whether it is social media, productivity apps, or collaboration tools, can help strengthen these skills.

3.1. Challenges in the Development of Digital Skills

Although the importance of digital skills is recognized, there are also challenges in developing them. Some of these include:

- **Access to technology**: all individuals have not access to digital devices or the Internet, which can create disparities in the development of digital skills it is found that there are growing differences between communities according to their level of technology and use of the Internet. The most disadvantaged are offline communities which are excluded from a range of social activities the phenomena of social exclusion with all its forms of manifestation are accentuated – pauperization, isolation, diminishing access to information, education and culture, access to social and health services, etc. Many offline communities suffer from the partial migration of human activities – shopping, commerce, socializing, leisure activities, professional interactions – to the Internet. Another disadvantage is the different level of literacy or training of citizens in the use of digital technologies. Their inability or limited ability to use the computer or even the phone for specific applications represents a limit or even a serious barrier in an adequate quality of life today.
- **Security and privacy**: The increased use of digital technology comes with security and privacy risks, which can discourage users from fully engaging. Technology-based services are prone to technical and security issues ranging from hardware failures, vulnerability to cyber-attacks, power outages, slow or non-existent connectivity, etc. Websites of public institutions are prone to malicious attacks from hackers and malware. Such cyber-attacks endanger citizens' personal data, as well as the confidential information of institutions and, therefore, it becomes vital for any kind of public institution or government agency to protect its systems from complex cyber threats.
- **Speed of technological change**: technology evolves rapidly and digital skills must be constantly updated to remain relevant.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

4. Digital Competences in the University Environment: A Local Didactic Perspective

As an applied part to complement the approach of valorising the theories and practices of digital culture, below are some of the results of a study carried out by the authors on students' opinions on how to use digital documentary resources. The respondents come from the West University of Timişoara, the University of Bucharest, the "Transilvania" University of Braşov, and other universities, to a lesser extent. The quantitative research method, the opinion survey by questionnaire (applied online) was used. The data presented are part of an ongoing research project on undergraduate and master's students' views of the bibliographic sources they use, and of their competencies and skills in using bibliographic databases. Data collection was carried out through the Google Forms platform, between November 2023 and February 2024, by completing the questionnaire in online format. There were 916 responses.

The results of our opinion survey, regarding the use of digital documentary resources by undergraduate/master students, are presented below.

Distribution of respondents by levels and years of education:

Undergraduate, Master, 1st year, 2nd year, 3rd year, 4th year

The respondents belong to all study years, from undergraduate and master levels, with a significant participation of 41.8% of 2nd-year undergraduate students, followed by 1st-year undergraduate (18.1%), 3rd-year undergraduate (15.2%), and 1st year master (11%) students.

Frequency of appeal to bibliographic resources in electronic format:

Daily, weekly, monthly, once in 2-3 months, during exam sessions, very rarely, not at all, every 2 days.

Students turn to sources of information in electronic format mainly daily: 70% of respondents or weekly: 19.2%, indicating that the preference for these resources is supported by university education.

Favourite locations to access the Internet:

At home, at the faculty, at the library, in public areas, everywhere.

Any location is suitable for accessing the Internet.

Extent to which students know about the existence of bibliographic databases and self-assess their skills in using them:

To a very large extent largely to a medium extent, to a small extent, to a very small extent, not at all.

Current generations of students are familiar with the use of bibliographic databases in the following proportions:

- 38.3%, to a medium extent
- 28.6% to a large extent
- 15.3% to a very large extent

or, at the opposite pole:

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

• 12.8%, to a small extent
• 5.0%, not at all.

Self-assessment of the need for training / improving one's information culture and the use of bibliographic databases:
YES, NO, I have already taken such a course

The students' need for training and improvement in the use of databases (78.4%) manifests itself to a degree almost like that of the daily use of electronic information resources (71%) as a result, the training offer in this sense should be in concordance.

5. Conclusions

The complexity of the digital environment, as an information and communication one, determines changes in the procedures and methods of creating, processing, and using documentary and informational resources changes in the informational behaviour of users, changes in social, cultural, educational, and economic activities lead to new paradigms in the field of information, documentation, and research, and fundamentally change contemporary society in all its components.

Digital skills are essential in contemporary society, influencing not only professional careers, but also civic participation and the educational process. It is crucial that individuals, educational institutions, and organizations work together to develop these skills, thus ensuring a society better prepared for the challenges of the future. In a digitized world, digital skills are not just an advantage: they are a fundamental necessity.

Notes

[1] Employers' organisations, trade unions, employment services, education and training providers, and European sectoral skills councils are among those already contributing to the development of the framework. Their continued and active involvement will ensure that DigComp remains a practical, flexible, and relevant tool – one that can be used by a wide range of individuals and organisations. More about DigComp can be found by accessing the full document: DigComp 2.2, The Digital Competence framework for citizens: with new examples of knowledge, skills and attitudes, Publications Office of the European Union, 2022. Available at: https://data.europa.eu/doi/10.2760/115376 [accessed 08.10.2024].

References

Attali, J. (2024) *Istoriile și scenariile de viitor ale educației* [online], Plural M, Polirom, available: https://polirom.ro/plural-m/8220-istoriile-%C5%9Fi-scenariile-de-viitor-ale-educa%C8%9Biei.html.

Bejan, Ștefania (2022) 'L'impossible «croisade» de la vérité à l'époque numérique', *Hermeneia*, (29), 105–115.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

Buchholz, B.A., DeHart, J., and Moorman, G. (2020) 'Digital Citizenship During a Global Pandemic: Moving Beyond Digital Literacy', *Journal of Adolescent & Adult Literacy*, 64(1), 11–17, available: https://doi.org/10.1002/jaal.1076.

Directorate-General for Education, Y. (2019) *Key Competences for Lifelong Learning* [online], LU: Publications Office of the European Union, available: https://data.europa.eu/doi/10.2766/569540 [accessed 1 Mar 2023].

Directorate-General for Employment, Social Affairs and Inclusion (European Commission) (2016) *EU Digital Competence Framework for Citizens* [online], Publications Office of the European Union, available: https://data.europa.eu/doi/10.2767/00458 [accessed 5 Nov 2024].

Joint Research Centre (European Commission), 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* [online], Publications Office of the European Union, available: https://data.europa.eu/doi/10.2760/115376 [accessed 5 Nov 2024].

Kluzer, S., Centeno, C., and Okeeffe, W. (2020) DigComp at Work [online], *JRC Publications Repository*, available: https://doi.org/10.2760/17763.

Redecker, C. (2017) European Framework for the Digital Competence of Educators: DigCompEdu [online], *JRC Publications Repository*, available: https://doi.org/10.2760/178382.

Sala, N.L. (2023) *L'universo narrativo dei social media. Racconto e responsabilità al tempo della rete*, Roma: AVE.

Skills and Qualifications - Employment, Social Affairs & Inclusion - European Commission [online] (2024) available: https://ec.europa.eu/social/main.jsp?catId=1146 [accessed 5 Nov 2024].
Tîrziman, E. (2023) *Societatea digitală* [online], Bucharest: ProUniversitaria, available: https://www.prouniversitaria.ro/carte/societatea-digitala/.

Yashalova, N.N., Shreider, N.V., and Yakovleva, E.N. (2019) 'Digital Literacy in Society: The Situation, Problems, and Prospects at the Current Stage of Scientific and Technical Progress', *Scientific and Technical Information Processing*, 46(4), 213–218, available: https://doi.org/10.3103/S014768821904004X.

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License