

1. Framework Title

DigComp 2.2: The Digital Competence Framework for Citizens. With new examples of knowledge, skills and attitudes.

2. Initials

DigComp 2.2

3. Document(s) in which the framework is presented (if there are previous versions, etc.)

Vuorikari, R., Kluzer, S. and Punie, Y., DigComp 2.2: The Digital Competence Framework for Citizens, EUR 31006 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-48882-8, doi:10.2760/115376, JRC128415.

<https://publications.jrc.ec.europa.eu/repository/handle/JRC128415>

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

<https://data.europa.eu/doi/10.2760/836968>

Vuorikari R, Punie Y, Carretero Gomez S and Van Den Brande G. DigComp 2.0: The Digital Competence Framework for Citizens. Update Phase 1: the Conceptual Reference Model. EUR 27948 EN. Luxembourg (Luxembourg): Publications Office of the European Union; 2016, doi: 10.2791/607218, JRC101254. <https://publications.jrc.ec.europa.eu/repository/handle/JRC101254>

Punie, Y. and Brecko, B., editor(s), Ferrari, A., DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe. , EUR 26035, Publications Office of the European Union, Luxembourg, 2013, ISBN 978-92-79-31465-0, doi:10.2788/52966, JRC83167.

4. Documents dates

2013; 2016; 2017; 2022

5. Number of pages of the document(s)

50; 44; 48; 134 (respectively)

6. Organizations or authors responsible for developing the framework, context (if applicable)

This publication is a Science for Policy report by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process.

Importantly also, the DigComp 2.2 update process has involved consulting a very broad number of stakeholders, including through the dedicated Community of Practice that was set up for this purpose. In addition, there was an open validation process both on-line and through interactive workshops with major international players such as ILO, UNESCO, UNICEF and the World Bank. This broad stakeholder involvement and buy-in is vital to achieving the continued recognition and success of the Digital Competence Framework.

With this update, our aim is to keep DigComp relevant for learning, working and participating in society, as well as for EU policy-making and the European Digital Strategy, including initiatives such as the Skills Agenda, the Digital Education Action Plan, the Digital Decade and Compass, and the Pillar of Social rights and its action plan.

European DigComp Community of Practice (CoP) have the objectives to promote the adoption and support the development of DigComp, the Digital Competence Framework for Citizens.

By early 2022, the DigComp CoP hosted 575 members from 57 countries in Europe and elsewhere. [...] the largest group is represented by educational organisations, in particular university teachers, researchers and students (190 members). Among Third Sectors organisations, almost half (51) are represented by digital competence centres, including several All Digital members.

7. Scope: regional (indicate region) or international

For more than a decade, the Digital Competence Framework for Citizens (DigComp) has provided a common understanding, across the EU and beyond, of what digital competence is, and therefore provided a basis for framing digital skills policy. There is already a high awareness of DigComp as the EU-wide framework for developing and measuring digital competence

*It was first published in 2013 and has become a reference for the development and strategic planning of digital competence initiatives at **both European and Member State levels.***

8. Synthesis

The Digital Competence Framework for Citizen (DigComp) provides a common understanding of what digital competence is. The present publication has two main parts: The integrated DigComp 2.2 framework provides more than **250 new examples of knowledge, skills and attitudes** that help citizens engage confidently, critically and safely with digital technologies, and **new and emerging ones such as systems driven by artificial intelligence (AI).** **The framework is also made available following the digital accessibility guidelines,** as creating accessible digital resources is an important priority today. The second part of the publication gives a snapshot of the existing reference material for DigComp consolidating previously released publications and references.

9. Purpose(s) of the framework

Reference frameworks such as the DigComp framework create an agreed vision of what is needed in terms of competences to overcome the challenges that arise from digitisation in almost all aspects of modern lives. Their aim is to create a common understanding using an agreed vocabulary which can then be consistently applied in all tasks from policy formulation and target setting to instructional planning, assessment and monitoring. Ultimately, it is up to the users, institutions, intermediaries or initiative developers to adapt the reference framework to their needs when tailoring interventions.

Going forward, DigComp can also play a central role in achieving our ambitious EU objectives with regard to the digital upskilling of the whole population and in developing a European Digital Skills Certificate. In the Digital Compass for Europe's digital decade, the EU has set the ambitious policy targets of reaching a minimum of 80% of the population with basic digital skills and having 20 million ICT specialists by 2030.

Since its adoption, DigComp has provided a scientifically solid and technology-neutral basis for a common understanding of digital skills and framing policy. However, things move fast in the digital sphere and a lot has happened since the framework was last updated in 2017. More specifically, emerging technologies, such as Artificial Intelligence, Virtual and Augmented reality, robotisation, the Internet of Things, datafication or new phenomena such as misinformation and disinformation, have led to new and increased digital literacy requirements on the part of the citizen. There is also an increasing need to address the green and sustainability aspects of interacting with digital technologies. The present update, therefore takes account of the knowledge skills and attitudes needed by citizens in the face of these developments.

10. Focus of the framework: citizens, workers, teachers, students, managers, parents, organizations, etc.

The Digital Competence Framework for Citizens, also known as DigComp, provides a common language to identify and describe the key areas of digital competence. It is an EU-wide tool to improve citizens' digital competence, help policy-makers formulate policies that support digital competence building, and

plan education and training initiatives to improve the digital competence of specific target groups. This report presents version 2.2 of the Digital Competence Framework for Citizens. It consists of an update of the examples of knowledge, skills and attitudes. Additionally, the publication also brings together the key reference documents on DigComp to support its implementation.

Ultimately, it is up to the users, institutions, intermediaries or initiative developers to adapt the reference framework to their needs when tailoring interventions (e.g. curriculum development) to fit the specific needs of target groups. To read more about the use of DigComp, see SECTION 3.

11. Methodology for the elaboration of the framework

The DigComp 2.2 update process has involved consulting a very broad number of stakeholders, including through the dedicated Community of Practice that was set up for this purpose. In addition, there was an open validation process both on-line and through interactive workshops with major international players such as ILO, UNESCO, UNICEF and the World Bank. This broad stakeholder involvement and buy-in is vital to achieving the continued recognition and success of the Digital Competence Framework.

The DigComp 2.2 revision process started in December 2020 with the focus on the examples of knowledge, skills and attitudes (KSA) applicable to each one of the 21 DigComp competences (Dimension 4). The update process was conducted in a close collaboration with the DigComp stakeholders' community, experts and a wider user-base in order to keep the spirit of co-construction.

1. the online DigComp Community of Practice (CoP) was activated;
2. The CoP is hosted by All Digital and it was used as a central point to coordinate the revision process which was comprised of 8 Steps;

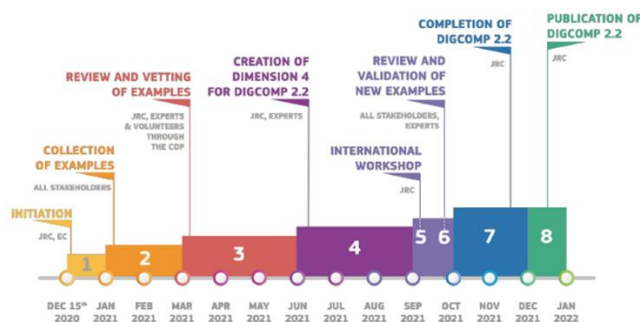


FIG.8 The process to finalise the DigComp 2.2 update

3. Starting in December 2020, a call for volunteers/contributors to join the DigComp CoP was first disseminated and an online kick-off event was held mid-January 2021 (Step 1).
4. The working groups' mission in Step 2 of the process was first to identify the new digital competence requirements for citizens which stem from new developments in the digital world and then to make initial suggestions for relevant knowledge, skills and attitudes (KSA) examples related to those requirements. The output of Step 2 was a list of requirements and related KSA examples for citizens' digital competence, along with suggestions about where they might fit into the DigComp framework (see BOX 4 with AI-related requirements and examples).
5. From March 2021 onwards, a review and vetting of the pool of requirements was organised in Working Groups (Step 3). In more concrete terms, this meant that the requirements, which were produced in Step 2, were now allocated to each of the 21 competences outlined in the DigComp framework and a more concrete work of de-fining examples of knowledge, skills and attitudes was undertaken.
6. During Steps 2 and 3, in addition to hosting the Working Groups, the online CoP was also used for thematic webinars on the WG themes so that a wider audience could also engage in the discussions and better follow the process of the update.
7. Especially in Step 3, as the conceptual work intensified, a core group of very committed experts in the field carried out a big part of

the work (see Acknowledgement section for details). The Working Group leaders were offered a small grant to support the delivery.

8. The initial idea was that the CoP members would be involved in the co-creation process from Step 2 to Step 3 for a period of 6 months, and get involved again at a later stage in the validation process (Step 6).[...] However, in reality, the WGs advanced and delivered at different times, and some WG members remained engaged through Step 4 concretely working on creating and revising the statements over summer 2021.
9. An important part of Step 4 was also to “stress test” the adequacy of the current conceptual reference model (i.e. 21 competences and 5 areas).
10. It was important to engage other international organisations in the co-creation process (Step 5). In September 22 2021, an international outreach workshop was organised with actors from other international institutions and academia (United Nations: University Institute for the Advanced Study of Sustainability; UN agency on Artificial Intelligence (AI); UNICEF AI for Children project; World Bank: EdTech team; Digital Economy for Africa; UNESCO: Media and Information literacy Unit; Technology and Artificial Intelligence in Education unit; Academia: Université Paris-Sorbonne nouvelle; London School of Economics; University College London; European Union Agencies: Education and Training Foundation (ETF); European Union Intellectual Property Office (EUIPO); European Commission: Directorate General for Education, Youth, Sport and Culture; Directorate General for Employment, Social Affairs & Inclusion; Joint Research Centre. The aim was to discuss the scope of the DigComp 2.2 exercise:
 - a. Do the new DigComp 2.2 statements cover themes and topics that your organisation also highlights and prioritises?
 - b. Are these new themes and topics arising as strategic also at the global levels?
 - c. How can DigComp 2.2 contribute to further the global agenda of citizens’ digital skills challenge?

11. The public online validation of the new KSA examples (Step 6) was run for a period of 6 weeks from November 9 to December 22 2021 using an online tool called EU Survey. Overall, 373 examples were included in the public validation.

12. Framework structure

The work on operationalising digital competence following the 2006 Council Recommendation, started in 2010. In 2013, the first DigComp reference framework came out defining digital competence as a combination of 21 competences grouped in five main areas. Since 2016, the five areas are Information and data literacy; Communication and collaboration; Digital content creation; Safety; and Problem solving.

The 2.2 update focuses on “Examples of the knowledge, skills and attitudes applicable to each competence” (Dimension 4). For each of the 21 competences, 10-15 statements are given to illustrate timely and updated examples that highlight contemporary themes. As such, the update does not alter descriptors of the conceptual reference model (FIG. 1) and it does not change how proficiency levels are outlined (Dimension 3). Also, use cases presented in Dimension 5 remain the same.

More than 250 examples highlight new and emerging themes that have arisen since the last update. The new examples will become useful, for example, for those who are responsible for curriculum planning and updating, and for those developing DigComp training syllabus or course content.

As the term “example” itself already explains, these new statements do not represent an exhaustive list of what the competence itself entails. Therefore, it is important to emphasise that the new DigComp examples of knowledge, skills and attitudes should not be taken as a set of learning outcomes that are expected from all citizens. However, it is possible to use them as a basis to develop explicit descriptions of learning objectives, content, learning experiences and their assessment, although this requires more instructional planning and implementation.

Secondly, the examples are not developed on proficiency levels. Even if

one can observe some heterogeneity and differences in their complexity (some examples of this might focus on a very rudimentary level of new knowledge whereas others can illustrate more complex tasks), this does not mean that they are an instrument to gauge progress. For each competence, Dimension 3 outlines 8 levels of proficiency.

Lastly, the new examples of knowledge, skills and attitudes are not offered as an assessment instrument or as a tool for self-reflection on one's own competence development.

Additionally, the publication 2022 also brings together the key reference documents on DigComp to support its implementation.

13. Definition of digital competence, digital literacy etc. proposed by the framework

“Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.” (Council Recommendation on Key Competences for Life-long Learning, 22 May 2018, ST 9009 2018 INIT).

The competences are a combination of knowledge, skills and attitudes, in other words, they are composed of concepts and facts (i.e. knowledge), descriptions of skills (e.g. the ability to carry out processes) and attitudes (e.g. a disposition, a mindset to act) (see BOX 1). Key competences are developed throughout life.

14. Competences proposed by the framework (areas, dimensions, competences, knowledge, skills and attitudes, levels of proficiency, etc.)

DigComp areas (Dimension 1) Areas identified to be part of the digital competence;

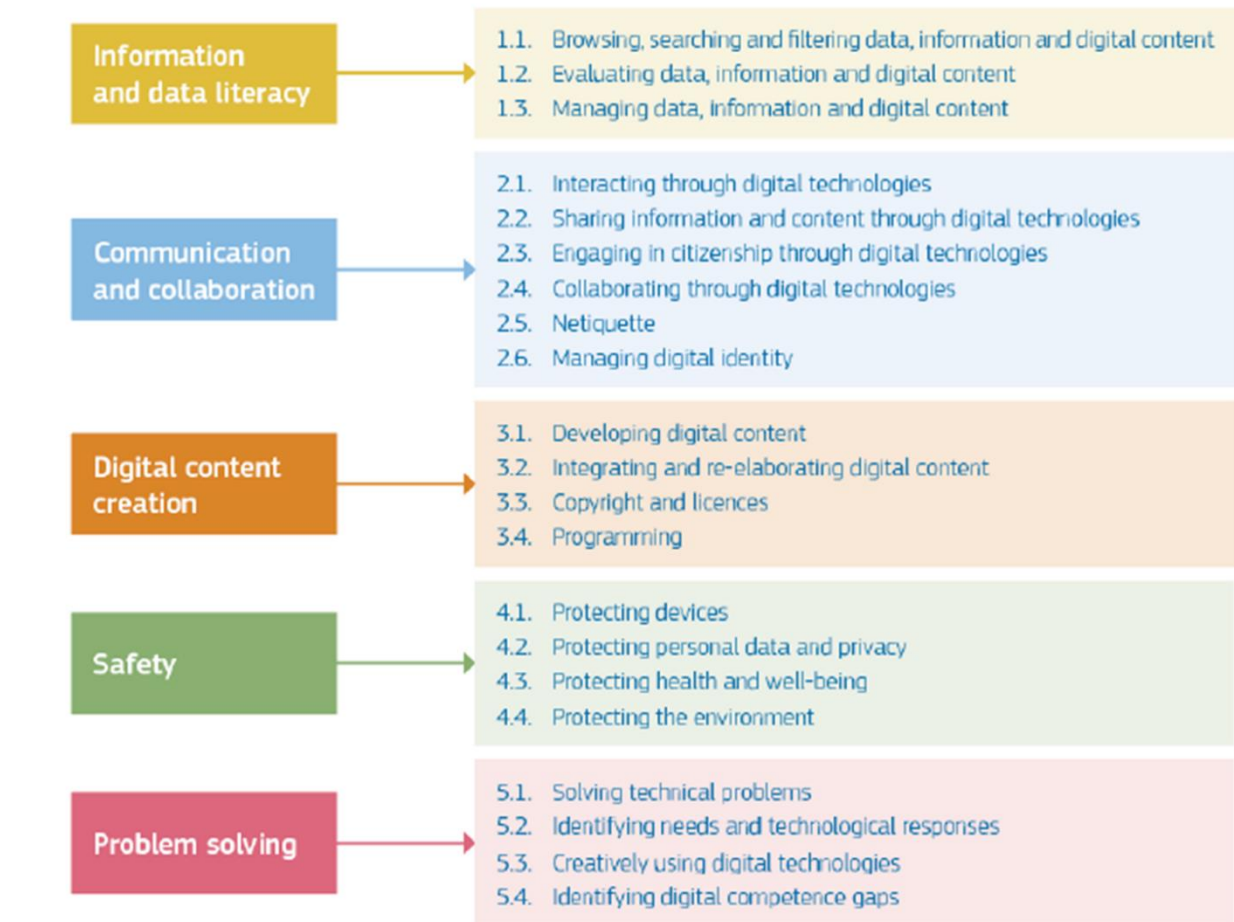
Dimension 2. Competence descriptors and titles that are pertinent to each

area

Dimension 3. Levels of proficiency for each competence

Dimension 4. Examples of the knowledge, skills and attitudes applicable to each competence

Dimension 5. Use cases on the applicability of the competence to different contexts.



Interconnections between the key competences

All Key competences are complementary and interconnected to each other. In other words, competences essential to one domain will support competence development in another. This is also the case between Digital competence and other Key competences. Some important interconnections are highlighted below, although they are non-exhaustive, their intention is to bring more focus on how this complementary nature might be encountered in digital

environments.

Some examples:

For example, aspects of Literacy competence are needed when reading on paper or on screen. According to the **Key Competences for Lifelong Learning** recommendation, Literacy competence includes, for example, “the abilities to distinguish and use different types of sources, to search for, collect and process information”. These skills are called upon when evaluating online content and its sources, a competence that forms an integral part of Information literacy in today’s media-rich environment (DigComp competence 1.2).

On the other hand, one the DigComp competence defines engaging in citizenship through digital technologies (DigComp competence 2.3). The Citizenship competence itself is defined in Key Competences as “the ability to act as responsible citizens and to fully participate in civic and social life”. The new examples attempt to illustrate this interconnection by highlighting knowledge, skills and attitudes that are complementary for both themes.

Entrepreneurship competence aims to create value in today’s world. Pairing it with Digital competence, and in particular with creatively using digital technologies (Dig-Comp competence 5.3), can help transform ideas into value for oneself and others. Netiquette (DigComp competence 2.5), on the other hand, draws upon the Key competence of Cultural awareness and expression, but also on the competence of multilingualism (the coexistence of different languages at the social or individual level) and plurilingualism (the dynamic and developing linguistic repertoire of an individual user/ learner) distinguished in the Common European Framework of Reference for Languages.

15. Examples of use

Each competence describes all dimensions, including the Dimension 5
USE CASES for the EMPLOYMENT AND LEARNING SCENARIO.

COMPETENCE1.1: BROWSING, SEARCHING AND FILTERING DATA, INFORMATION AND DIGITAL CONTENT

DIMENSION 5: USE CASES

Employment Scenario: Job seeking process

Foundation level 1: with help from an employment adviser

- I can identify, from a list, those job portals which can help me look for a job.

- I can also find these job portals in my smartphone's app store, and access and navigate between them.

- From a list of generic keywords for job seeking available in a blog on job hunting, I can also identify the keywords that are useful for me.

Learning Scenario: Prepare a short report on a specific topic

Foundation level 1: with help from my teacher

- I can identify websites, blogs and digital databases from a list in my digital textbook to look for literature on the report topic.

- I can also identify literature on the report topic in these websites, blogs and digital databases, and access and navigate among them.

- Using a list of generic keywords and tags available in my digital textbook, I can also identify those which would be useful for finding literature on the report topic.

A2. CITIZENS INTERACTING WITH AI SYSTEMS

Main authors: Riina Vuorikari, Wayne Holmes

Today, for citizens to engage confidently, critically and safely with new and emerging technologies, including systems driven by artificial intelligence (AI), they need to acquire a basic understanding of such tools and technologies (DEAP2).

[...] The DigComp 2.2 update addresses the topic of citizens interacting with AI systems rather than focusing on the knowledge about Artificial Intelligence per se.

The co-creation process of the 2.2 update resulted in a list of more than 80 examples of knowledge, skills and attitudes related to citizens interacting with AI systems (see more about the process in FIG.9). 35 are included in Dimension

4 so that each DigComp competence area has a number of examples that illustrate various aspects to pay attention to when citizens interact with AI systems. The selection was guided by the feedback collected through public validation.

Additionally, a separate appendix on this new topic was created. It covers all 73 examples which have been revised according to comments received through the public validation. In this appendix, the examples are thematically grouped so as to facilitate the reading. After each example, the corresponding number to the competence is given.

A3. REMOTE WORKING EXAMPLES

12 examples of remote working were elaborated. 4 examples were included in DIGCOMP 2.2. All examples were included in an appendix to the publication.

A4. ACCESSIBLE VERSION OF THE FRAMEWORK

Creating accessible digital resources is an important priority today and a goal that everyone can contribute to. In the following pages a fully accessible version of the DigComp 2.2 framework is made available.

Validar para compreender:

Dimension 5 provides use cases in the context of learning and education. Dimension 5 uses a “cascade” strategy: competence 1.2 has an example for level 1, competence 1.3 for level 2, competence 2.1 for level 3, etc.

16. Indications for the elaboration of instruments based on the framework

The European Skills Agenda, of 1 July 2020, supports digital skills for all, including by supporting the objectives of the Digital Education Action Plan, which has the objectives of i) enhancing digital skills and competences for the digital

transformation while ii) fostering the development of a high-performing digital education system. The Digital Compass and the European Pillar of Social Rights Action Plan set the ambitious policy targets of reaching a minimum of 80% of the population with basic digital skills and having 20 million ICT specialists by 2030.

The DigComp 2.2 update

The Digital Competence Framework for Citizens, also known as DigComp, provides a common language to identify and describe the key areas of digital competence. It is an EU-wide tool to improve citizens' digital competence, help policy-makers formulate policies that support digital competence building, and plan education and training initiatives to improve the digital competence of specific target groups. This report presents version 2.2 of the Digital Competence Framework for Citizens. It consists of an update of the examples of knowledge, skills and attitudes. Additionally, the publication also brings together the key reference documents on DigComp to support its implementation.

DigComp implementations

From 2013 up until now, DigComp has been used for multiple purposes, particularly in the context of employment, education and training, and lifelong learning. Additionally, DigComp has been put into practice at EU level to construct the Digital Skills Indicator (DSI), which is used for setting policy-targets and to monitor the Digital Economy and Society (DESI). Another example is incorporated into the Europass CV enabling jobseekers to evaluate their own digital competence and include the evaluation in their Curriculum Vitae.

17. Miscellaneous

Some examples:

DIMENSION 1 • COMPETENCE AREA 2. COMMUNICATION AND COLLABORATION

DIMENSION 2: COMPETENCE 2.3: ENGAGING IN CITIZENSHIP THROUGH DIGITAL TECHNOLOGIES

DIMENSION 4: EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

Knowledge

67. Knows about different types of digital services on the internet: public ones (e.g. services to consult tax information or make an appointment in the health care centre), community-based services (e.g. knowledge repositories such as Wikipedia, map services such as Open Street Map, environmental monitoring services such as Sensor Community) and private services (e.g. e-commerce, online banking).

DIMENSION 1: COMPETENCE AREA4. SAFETY

DIMENSION 2: COMPETENCE4.4: PROTECTING THE ENVIRONMENT

To be aware of the environmental impact of digital technologies and their use.

DIMENSION 4: EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

Knowledge

203. Aware of the environmental impact of everyday digital practices (e.g. video streaming that rely on data transfer), and that the impact is composed of energy use and carbon emissions from devices, network infrastructure and data centres.

204. Aware of the environmental impact of the manufacturing of digital devices and batteries (e.g. pollution and toxic by-products, consumption of energy) and that at the end of their life, such devices must be appropriately disposed of to minimise their environmental impact and to enable reuse of rare and expensive components and natural resources.

206. Knows 'green' behaviours to follow when buying digital devices, e.g. choose products with less energy consumption during use and stand-by, less polluting (products easier to dismantle and recycle) and less toxic (limited use of substances harmful to the environment and health).

207. Knows that e-commerce practices such as purchasing and delivery of physical goods have an impact on the environment (e.g. carbon footprint of transport, generation of waste).

209. Aware that certain activities (e.g. training AI and producing cryptocurrencies like Bitcoin) are resource intensive processes in terms of data and computing power. Therefore, energy consumption can be high which can also have a high environmental impact. (AI)

Attitudes

213. Seeks out ways in which digital technologies could help live and consume in a way which respects the sustainability of human society and the natural environment.

214. Seeks out information regarding the environmental impact of technology to influence one's behaviour and that of others (e.g. friends and family) to be more eco-responsible in their digital practices.

215. Considers product's overall impact on the planet when choosing digital means over physical products, e.g. reading a book online does not need paper and thus transport costs are low, however, one should consider digital devices including toxic component and needed energy to be charged.

216. Considers the ethical consequences of AI systems throughout their life-cycle: they include

both the environmental impact (environmental consequences of the production of digital devices and services) and societal impact, e.g. platformisation of work and algorithmic management that may repress workers' privacy or rights; the use of low-cost labour for labelling images to train AI systems. (AI)

Skills

210. Knows how to apply efficient low-tech strategies for protecting the environment, e.g. shutting down devices and switching off Wi-fi, not printing out documents, repair and replace component to avoid the unnecessary replacement of digital devices.

212. Knows how to use digital tools to improve the environmental and social impact of one's consumer behaviour (e.g. by looking for local produce, by searching for collective deals and car-pooling options for transportation).