

Useful AI examples of knowledge, skills and attitude from DigComp 2.2

AI knowledge, skills and attitude examples from Annex 2 (specific competence in parenthesis)

AI 05. Aware that AI systems can be used to automatically create digital content (e.g. texts, news, essays, tweets, music, images) using existing digital content as its source. Such content may be difficult to distinguish from human creations. (3.1)

AI 06. Aware that in the news media and journalism, for example, AI can be used to author and produce news stories, and also distribute stories based on users' online behaviour. (3.1)

AI 07. Aware that AI systems can help the user to edit and process digital content (e.g. some photo editing software uses AI to automatically age a face, while some text applications use AI to suggest words, sentences and paragraphs). (3.2).

AI 08. Aware that some AI systems aim to provide human-like interaction with machines (e.g. conversational agents such as customer service chatbots). (2.1)

AI 16. Aware that AI systems use statistics and algorithms to process (analyse) data and generate outcomes (e.g. predict what video the user might like to watch). (1.3)

AI 29. Knows how to formulate search queries to achieve the desired output when interacting with conversational agents or smart speakers (e.g. Siri, Alexa, Cortana, Google Assistant), e.g. recognising that, for the system to be able to respond as required, the query must be unambiguous and spoken clearly so that the system can respond. (1.1)

AI 31. Weighs the benefits and disadvantages of using AI-driven search engines (e.g. while they might help users find the desired information, they may compromise privacy and personal data, or subject the user to commercial interests). (1.1)

AI 33. Able to interact and give feedback to the AI system (e.g. by giving user ratings, likes, tags to online content) to influence what it next recommends (e.g. to get more recommendations on similar movies that the user previously liked). (2.1)

AI 38. Knows how to incorporate AI edited/manipulated digital content in one's own work (e.g. incorporate AI generated melodies in one's own musical composition). This use of AI can be controversial as it raises questions about the role of AI in artworks, and for example, who should be credited. (3.2)

AI 39. Knows that the processing of personal data is subject to local regulations such as the EU's General Data Protection Regulation (GDPR) (e.g. voice interactions with a virtual assistant are personal data in terms of the GDPR and can expose users to certain data protection, privacy and security risks. (4.2)

AI 45. Aware that everything that one shares publicly online (e.g. images, videos, sounds) can be used to train AI systems. For example, commercial software companies who develop AI facial recognition systems can use personal images shared online (e.g. family photographs) to train and improve the software's capability to automatically recognise those persons in other images, which might not be desirable (e.g. might be a breach of privacy). (2.2)

AI 48. Aware that AI algorithms might not be configured to provide only the information that the user wants; they might also embody a commercial or political message (e.g. to encourage users to stay on the site, to watch or buy something particular, to share specific opinions). This can also have negative consequences (e.g. reproducing stereotypes, sharing misinformation). (1.2)

AI 49. Aware that the data, on which AI depends, may include biases. If so, these biases can become automated and worsened by the use of AI. For example, search results about occupation may include stereotypes about male or female jobs (e.g. male bus drivers, female sales persons). (1.2)

AI 51. Knows that the term “deep-fakes” refers to AI-generated images, videos or audio recordings of events or persons that did not really happen (e.g. speeches by politicians, celebrity faces on pornographic imagery). They may be impossible to distinguish from the real thing. (1.2)

AI 55. Aware that AI systems are typically developed in English-speaking contexts which means that they might work less accurately in non-English contexts. For example, AI-based automatic translation systems work better with often used languages (e.g. English to Spanish) than less used ones (e.g. Slovenian to Finnish). (2.5)

AI 57. 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). (4.4)

AI 60. Aware that AI-based technologies can be used to replace some human functions (e.g. customer service), which might lead to some job losses or reallocations, but that new jobs might be created to address new needs. (2.4)¹

AI 63. Recognises that while the application of AI systems in many domains is usually uncontroversial (e.g. AI that helps avert climate change), AI that directly interacts with humans and takes decisions about their life can often be controversial (e.g. CV-sorting software for recruitment procedures, scoring of exams that may determine access to education). (2.3)

AI 71. Interested in experimenting with various types of AI systems depending on one’s own personal needs (e.g. virtual assistant, image analysis software, speech and face recognition systems, autonomous cars, “embodied” AI such as robots). (5.2)

AI 72. Has a disposition to keep learning, to educate oneself and stay informed about AI (e.g. to understand how AI algorithms work; to understand how automatic decision-making can be biased; to distinguish between realistic and unrealistic AI; and to understand the difference between Artificial Narrow Intelligence, i.e. today’s AI capable of narrow tasks such as game playing, and Artificial General Intelligence, i.e. AI that surpasses human intelligence, which still remains science fiction). (5.4)

AI 73. Open and curious towards today’s emerging technologies and applications (e.g. reads reviews about Virtual Reality, gaming, AI) and intentionally discusses about their use with other people. (5.4)

Additional KSA examples which are not AI specific, but relevant also for AI

23. Carefully considers the top/first search results in both text-based and audio searches, as they may reflect commercial and other interests rather than be the most appropriate results for the query. (1.2) (S)

25. Knows how to analyse and critically evaluate search results and social media activity streams, to identify their origins, to distinguish fact-reporting from opinion, and to determine whether outputs are truthful or have other limitations (e.g. economic, political, religious interests). (1.2) (S)

28. Inclined to ask critical questions in order to evaluate the quality of online information, and concerned about purposes behind spreading and amplifying disinformation. (1.2) (A)

254. Knows how to talk about the importance of recognising “fake news” to others (e.g. elders, youngsters) by showing examples of reliable news sources, and how to differentiate between the two. (5.4) (S)

256. Open to ask to be taught how to use an application (e.g. how to book a doctor’s appointment on the internet) rather than delegating the task to someone else. (5.4) (A)

257. Willing to help others to improve their digital competencies, building on their strengths and mitigating their weaknesses. (5.4) (A)

¹ A discussion of the “replacement” issue regarding teachers can be found in the JRC report by Vuorikari, R., Punie, Y. and Cabrera Giraldez, M, [Emerging technologies and the teaching profession](#), 2020.