LEARNING MODULE #1
DATA LITERACY

Beyond Disciplinary Boundaries

LEARNING CONTENT & METHODS

- Consider and practice **key digital skills**: Data Literacy[1], Capability to evaluate AI outcomes or digital functioning.
- Acquire **transferable skills**: Adaptability, Transferability, Reflexivity, Imagination and Conclusion Anticipation.
- Consider the frequency of Confirmation bias and Shared realities.
- Use a **transdisciplinary approach**: Application of and shifts in paradigms

1. INTRODUCTION: REFLECT, APPLY AND TRANSFER YOUR CURRENT KNOWLEDGE

The interchange of complex information continuously shapes our society as well as the fields of education, research, and the professional world. Our daily work involves interacting with digital data, which calls for a specific degree of knowledge, abilities, attitudes and values. Think about the following example: Plato's well-known Allegory of the Cave in The Republic's seventh book[2]. Socrates, among other things, demonstrates the distinction between education and illiteracy, which, in our context, could be linked to the capacity for deliberate handling of facts and data or to unfamiliarity/unreflective handling[3].

Please read the parable located on the left.
☉ Reflect on the key points **highlighted** and

☉ transfer these contexts to today's interaction with digital data or AI-based systems. Consider your specific context (personal or professional), level of interaction and understanding of the functionalities of the technologies.

Allegory of the Cave

On the earth's surface, a steep slope leads into a cave where people spend their **entire lives imprisoned**. They are bound so tightly that **all they can see is the cave wall in front of them**. They are unable to see one another, the exit, or even themselves. A fire is burning behind them, illuminating the wall they are staring at. There is a little wall between the prisoners and the fire, behind which **other individuals hide as carriers,** carrying objects, miniature human bodies or other living things. The prisoners can see the shadows of the objects cast on the wall by the lighting. The fact that some of the carriers speak makes the prisoners believe that the shadows may be speaking. **The prisoners perceive the information on the wall and the sounds they hear as facts**. The parable culminates in the release of a prisoner who returns to the cave after slowly adapting to life on the surface and gaining knowledge of reality. Back there, he cannot keep up with the other prisoners, who chose to stay there and practice their fabricated shadow science. As a result, the other prisoners **conclude that it is not worth leaving the cave**.

Digital and/or AI-based tools

... ✎ _____
What do the prisoners with monovisual stare stand for?

... ✎ _____
What do the hidden carriers stand for?

... ✎ _____
What does this monovisual and manufactured reality represent?

... ✎ _____
What might this conclusion imply in light of the actions of our society?

[1] For further reading on Data Literacy see: Unger, V., Beck, M., & Husfeldt, V. (2023). Data Literacy. In T. Philipp & T. Schmohl (Eds.), *Handbook Transdisciplinary Learning*. transcript. and Schüller, K., Busch, P., Hindinger, C. (2019). Future Skills: Ein Framework für Data Literacy – Kompetenzrahmen und Forschungsbericht. Arbeitspapier Nr. 47. Berlin: Hochschulforum Digitalisierung. DOI: 10.5281/zenodo.3349865
[2] Plato. (1943). Plato's The Republic. New York :Books, Inc.
[3] Please note that the parable is outlined in an abbreviated form to provide a starting paradigm. For a philosophical interpretation it is recommended to read the complete parable and the secondary literature.

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Tags: Data Literacy; Adaptability, Transferability, Reflexivity; Paradigm shifting

2. GAIN KNOWLEDGE

Data literacy provides the framework for knowledge, skills, responsibilities, and attitudes necessary for a critical and responsible use and reception of digital data today and in future. Important facets of these skills include the following, among others[4]:

- Gaining knowledge how to produce and process reliable digital data in a conscientious manner,
- verifying and understanding the functionality of Big data, algorithms or AI (limited),
- knowing how to store, protect, manage, share, analyze or interpret (AI) data,
- being able to classify the sensitivity of data,
- knowing about inequalities and biases caused by digital/AI systems,
- taking the ethical component into account, etc.

According to the Data Literacy Charter, actors dealing with data must be able to answer four questions:

? "What do I want to do with data?"   ? "What am I allowed to do with data?"
? "What can I do with data?"   ? "What should I do with data?"[5]

3. REFLECT AND APPLY THE KNOWLEDGE INTO YOUR PARTICULAR SITUATION

The allegory as well as the transfer exercise (see 1. Introduction) served as a first general visualisation of other contexts. Please think of your individual activity. Now go through the four questions above (2. Gain Knowledge) and find your answers in specific reference to your educational or professional activity.
You may do this exercise alone or in a group discussion. In the latter case, you have the opportunity to answer questions from the audience in order to sharpen your own involvement.

4. BUILD FURTHER PARADIGMS AND ANTICIPATE CONSEQUENCES

Now that you have a basic framework for dealing with data, look at these contexts and mark the branches that might be of relevance to you. Think about what actions you could take or what research you would need to do to manage data with literacy.
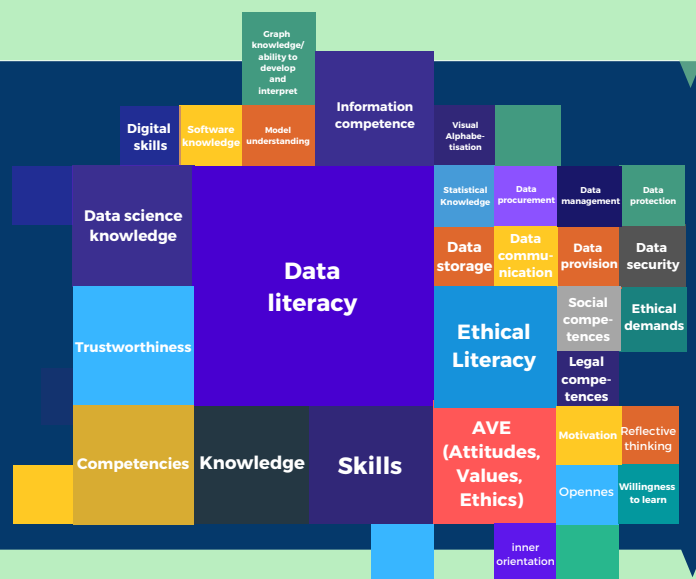
5. BE AWARE OF CONFIRMATION BIAS AND SHARED REALITIES

In addition to the need to consciously reflect on the contexts of our actions, there are two aspects that influence how we select information which shapes our concepts and attitudes. According to confirmation bias, we selectively choose and design our environment according to our needs and beliefs (e.g., we follow only those information channels that correspond to our own convictions) and thus interact with an environment that confirms us. As a result, we tend to share and co-create our truths with others, becoming more confident if those hold the same interpretations or attitudes (shared realities)[6]. **The specifics of our subjective inner attitudes also must be reflected upon when interacting with digital data.**

[4] Ridsdale, C., Rothwell, J., Smit, M. et al. (2015). Strategies and Best Practices for Data Literacy Education Knowledge Synthesis Report.
[5] Schüller, K., Koch, H. & Rampelt, F. (2021). Data Literacy Charter. Stifterverband
[6] Echterhoff, G., & Higgins, E. T. (2017). Creating shared reality in interpersonal and intergroup communication: The role of epistemic processes and their interplay. European Review of Social Psychology, 28(1), 175–226; Lallement, J., Dejean, S., Euzéby, F. et al. (2020). The interaction between reputation and information search: Evidence of information avoidance and confirmation bias. Journal of Retailing and Consumer Services, 53, 101787; Meppelink, C. S., Smit, E. G., Fransen, M. L. et al. (2019). "I was Right about Vaccination": Confirmation Bias and Health Literacy in Online Health Information Seeking. Journal of Health Communication, 24(2), 129–140; Rossignac-Milon, M., & Tory Higgins, E. (2018). Beyond Intrapersonal Cognitive Consistency: Shared Reality and the Interpersonal Motivation for Truth. Psychological Inquiry, 29(2), 86–93.

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