Part 3: "AI Basics" for Instructors and Students

1. Foundational Understanding of AI

Generative artificial intelligence refers to systems that can create new content, such as text, code, audio, or images, based on large datasets. Well-known applications include large language models that respond to user inputs ("prompts") and generate answers accordingly.

These systems are trained on very large amounts of text from the internet. In doing so, they learn statistical patterns in language, that is, which words and phrases frequently occur together. Based on this, the AI predicts the most probable continuation of text.

Generative AI, however, does not possess an understanding of meaning, truth, or context in the human sense. It generates responses based on statistical probabilities in the training data.

2. Key Limitations and Risks

Several limitations must be considered when using generative AI:

Error-Proneness: AI systems can generate incorrect information or invent sources ("hallucinations"). In the context of literature research, for example, AI applications may attribute topics to a paper that are not actually covered in it. For this reason, AI-generated claims should always be verified. If verification is not possible, the information should not be used.

Bias and Perspective Distortions: Responses may reproduce biases from training data or reinforce assumptions contained in the user's input. Examples: Frequently cited or salient events may be presented as more typical than they are. Example: The prompt "Prove that X is bad" leads to a one-sided, confirmatory response.

Lack of Transparency: The functioning of many AI systems (especially those from commercial providers) is only partially transparent, particularly regarding training data and decision-making processes.

Data Protection and Copyright: Entering sensitive content (e.g., personal data or unpublished work) may raise data protection and copyright issues.

Conversation Illusion: Interaction with AI in many common applications (e.g., ChatGPT) structurally resembles human conversation. However, many characteristics of human communication do NOT apply to AI:

- In humans, eloquent language is usually an indicator of solid knowledge – in AI, there is no reliable relationship between eloquence and content quality. AI systems can present content in a very convincing and fluent linguistic form. The linguistic quality of a response, however, says nothing about its factual accuracy or scientific validity.
- Human statements often contain (indirect) cues about the certainty of the statement – in AI, there are no such cues indicating whether statements are based on numerous or isolated data points, or are simply fabricated.
- Humans disagree and hold their own positions – AI tends toward confirmation and saying what feels good to the user, and often encourages further use by suggesting follow-up questions.

Responsibility Paradox: The design of AI suggests that one is having a conversation with a human. When it comes to responsibility, however, we expect users to be aware that they are dealing with a machine that can make errors, and to keep the limitations of AI outputs in mind. From a psychological perspective, this is a significant challenge.

Overtrust and Overgeneralization: Various biases in human information processing promote the development of overtrust – that is, excessive trust in AI beyond its actual capabilities. These include, for example, failure to verify AI results and general trust in AI after repeated positive experiences in individual cases (overgeneralization, positivist thinking), overestimation of one's own contribution in AI-assisted texts (self-serving bias), and increasingly uncritical use as one's own dependence on AI grows, in order to continue justifying that use (dissonance reduction).

Competent use of generative AI, therefore, always requires critical evaluation of results.

3. Responsibility of Users

Regardless of AI tool use, students and instructors bear responsibility for any content they use, share, or publish. This applies particularly to scientific statements, quotations, and citations.

AI-generated content should therefore never be adopted without verification. For academic work, independent research in the relevant literature remains essential.

4. Tools

The availability of AI tools is subject to dynamic developments. The focus is not on the variety of tools used, but on their reflective and responsible application. The following link provides a thematically structured, regularly updated collection of AI tools for academic reading and writing. Responsibility for the content remains with the author.

- Published under CC BY 4.0 and maintained by: Nils Van Quaquebeke https://docs.google.com/document/d/1mb4SWtqyi1iEGCn2uTnHkPHqW3UoQr8b0xv5_81a-4Y/edit?tab=t.0

5. Basics of Prompt Engineering

Because the quality of AI-generated responses depends heavily on how prompts are formulated, a basic understanding of prompt engineering is helpful for responsible and effective AI use. The following points provide guidance on which elements can help formulate clearer prompts and better contextualize results.

Elements of a Good Prompt

The quality of generative AI responses depends heavily on how the prompt is formulated. A clearly formulated prompt helps the AI deliver more relevant results. Typical components of a good prompt include:

- **Clear Task Description:** A precise description of what the AI should do (e.g., explain, summarize, list, present in tabular form).

- **Contextual Information:** Relevant background information on the topic, the purpose of the request, or the subject-specific framework (e.g., psychological approach, study context).
- **Target Audience or Perspective:** Indication of who the response is intended for (e.g., bachelor's students, academic audience).
- **Desired Response Format:** Guidance on the structure of the output (e.g., bullet points, short paragraph, table, comparison).
- **Scope and Focus:** Indications of how detailed the response should be and which aspects should be particularly emphasized.

6. Learning Opportunities for Acquiring AI Competence

The following links provide thematically structured, regularly updated collections of freely available learning resources on AI. Responsibility for the content remains with the respective authors.

In light of current legal frameworks (cf. Art. 4 EU AI Act), which place a particular responsibility on educational institutions to foster relevant competencies when using AI, these offerings can provide helpful orientation and support.

- Published and maintained by: Stifterverband für Künstliche Intelligenz (content in German and English): https://ki-campus.org/
- Published and maintained by the appliedAI Institute for Europe, a non-profit organization based in Heilbronn and Munich (registration required; content in German and English): https://lms.appliedai-institute.de/
- Published and maintained by Elements of AI, a Finnish consultancy MinnaLearn and the University of Helsinki (content in German and English): https://www.elementsofai.de/

Part 4: Impulses for Teaching in Higher Education

The development and widespread availability of artificial intelligence is fundamentally changing teaching, learning, and assessment at universities. The aim of these guidelines is not to prevent or prohibit these developments, but to continue ensuring high-quality scientific education for students. While not all assessment formats can be fully protected against inappropriate AI use, teaching and learning processes can be designed to foster core competencies, achieve learning objectives, and sustainably strengthen academic work.

Instructors at the Department of Psychology commit to reviewing the following **checklist** at the beginning of each course. The purpose of the checklist is not to restrict academic freedom, but to encourage instructors to address the topic of 'artificial intelligence' and communicate to their students what applies and is expected for the respective course and thesis. The checklist should be applied consistently across courses that share common assessment formats, e.g., for the empirical research practicum.

1. Checklist for Instructors

1. Learning Objectives and Use of AI	
☐	I have clearly defined the learning objectives and explained how AI can be used to achieve them in alignment with academic integrity.
☐	I have discussed my learning objectives and explained at which points the use of artificial intelligence can be meaningful or may be used in a supportive role to achieve them.
☐	I have considered how I will assess the achievement of the learning objectives and how students can demonstrate this using AI tools while maintaining their academic integrity. In this context, I have explained the criteria by which I identify a suspected violation of the appropriate use of AI applications and have informed the students that the consequences include the initiation of an academic integrity investigation.
2. Communication of the AI Guidelines	
☐	Sections 1 to 3 of these AI guidelines are uploaded to my Moodle course, and I have informed students of their availability.
3. Fostering AI Competencies	
☐	I take advantage of relevant learning opportunities to support the competent use of artificial intelligence and continuously develop my own competencies in this area.
☐	I inform my students about suitable learning opportunities on the use of artificial intelligence. I make it transparent when the competencies taught there form an important foundation for successful participation in my course.
☐	I support my students in acquiring basic competencies in the reflective and responsible use of artificial intelligence – also in light of current European developments (e.g., Art. 4 EU AI Act).

2. Pedagogical Recommendations for the Use of Artificial Intelligence in Teaching and Assessment

1. Aligning Assessment Formats Based with Learning Objectives

Proctored assessments (i.e., in-person exams) are particularly appropriate when the learning objectives require an individual, independent performance without external assistance. These include, above all, foundational knowledge, basic methodological skills, and core subject-specific competencies that are prerequisites for advanced learning.[1]

Unproctored assessment formats (e.g., term papers, portfolios, project work) are better suited for assessing complex, reflective, and application-oriented competencies. In these formats, complete control or regulation of AI use is not possible and should therefore be considered when designing task and assessment criteria.

[1] In the context of proctored in-person exams, attention should be drawn to technological innovations for cheating, such as nearly invisible earbuds or so-called spy pens with wireless online connections.

2. Integrating Practice Time and Independent Production Phases into Teaching

Courses should intentionally include practice time and independent production phases. In these phases, students build the competencies that will later be assessed. They also increase transparency regarding which performances are expected from students individually and will be assumed in the further course of study.

3. Considering Process-Oriented Working Methods

In addition to evaluating the final product, the work process can also be integrated into teaching and assessment. This can be done, for example, through interim submissions, brief reflections, or explanations of methodological decisions (example questions: Why did you choose this method? Which alternatives did you discard? Where did difficulties arise and how were they resolved?). Such process-oriented elements give instructors better insight into students' learning and reflection processes. This makes individual learning processes more transparent, particularly to students themselves, promotes academic reflection, and practices supportive rather than substitutive uses of AI.

4. Implementing AI Usage Limitations Where Justified by Specific Competency Goals and Technically Verifiable

Restrictions on AI use are appropriate and justified when they are pedagogically grounded and technically and organizationally feasible to implement. This includes, in particular, that requirements and restrictions are clearly communicated to students and that compliance can be verified, for example through suitable task formats, assessment forms, or accompanying reflection and documentation requirements. The goal is to promote a transparent, competency-oriented, and responsible use of AI tools, rather than restricting it categorically.