ETH zürich Universität Zürich[UZH]

AI Competence Hub

AI Competence Framework for Teaching Staff

The AI Competence Framework for teaching staff serves as a guideline for the development and enhancement of competencies in the field of Artificial Intelligence (AI) in higher education teaching. It is essential that the impacts and implications of AI are consistently considered within the context of one's specific academic discipline and integrated accordingly. This approach ensures a sound and practice-oriented application of AI that aligns with both the specific requirements of the discipline and overarching pedagogical, ethical, and data protection standards.

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The AI Competence Framework for teaching staff was developed as part of the "Open Education & Digital Competencies (PgB 2025-2028)"[1] program by swissuniversities, within the project "AI Competence Hub", a collaboration between the University of Zurich and the ETH Zurich.

[1] https://www.swissuniversities.ch/en/themen/digitalisierung/open-education-digital-competencies

Overall Objective

The AI Competence Framework supports teaching staff in developing a deep understanding of the diverse applications of AI and in using it purposefully to enhance teaching and learning processes. It promotes critical engagement with both the potential and the challenges of AI and encourages the continuous development and use of innovative AI-supported methods and tools in higher education. Moreover, it aims to enable teaching staff to guide students in the reflective, competent, and responsible use of AI - particularly in fostering active, self-directed learning.

AI Competence Framework Target Groups

- **Teaching Staff**: Serves as a guide or roadmap to help teaching staff assess their current level of AI competencies and identify pathways for further development.
- **Program and Course Designers**: Supports the design and development of courses and offerings to ensure a broad and high-quality selection of AI-related content and resources that address a wide range of subject areas.
- **Curriculum Development (long-term objective):** Helps identify essential AI competencies that should be integrated into long-term curriculum development.

Explanatory Notes on the AI Competence Framework

The following notes clarify how the AI Competence Framework is structured and how it supports teaching staff in developing their AI competencies in a structured and practice-oriented manner.

- **Foundation and Adaptability:** The AI Competence Framework serves as a foundational tool for developing AI competencies among teaching staff. Its descriptions and content are continuously refined and adapted to keep pace with rapid advancements in the field of Artificial Intelligence.
- **UNESCO AI Competency Framework:** This framework is informed by the UNESCO AI Competency Framework for Teachers (Miao & Cukurova, 2024), which provides a solid foundation for the development of AI competencies tailored specifically to the needs and challenges of the education sector.
- **Competence Areas:** The competence areas defined in the framework combine knowledge, skills, and abilities. This structure is also based on the ETH Competence Framework (ETH Zurich, 2025) and ensures that teaching staff are adequately prepared to meaningfully integrate AI into higher education teaching and learning.
- **Competence Development Levels:** Competence acquisition is organized into three progressive levels: Acquire, Deepen, and Create. These levels support a step-by-step and in-depth development of AI-related competencies, as outlined in the UNESCO framework.

- **Foundation of the "Acquire" Level:** The Acquire level serves as the foundation for all subsequent stages of competence development. All teaching staff should be enabled to reach this fundamental level, as it establishes a solid groundwork for further growth.
- **Effort Varies by Competence Area:** The level of effort required to achieve each stage of competence varies depending on the specific competence area. This variation reflects the specific demands and challenges associated with each competence area.

Overview of Competence Areas

Competence Area A: Understanding AI and its Applications

- A-1: Fundamentals of Artificial Intelligence
- A-2: Application Domains of AI

Competence Area B: Designing AI-Supported Teaching and Learning Processes

- B-1: Using AI to Support Instructional Planning and Preparation
- B-2: Personalization and Differentiation through AI
- B-3: Promoting Engagement and Active Learning with AI
- B-4: Applying AI in Assessment

Competence Area C: Using AI Ethically and Responsibly

- C-1: Fundamental Ethical Principles in the Use of AI
- C-2: Data Protection and Security in the Use of AI

Competence Area A:
Understanding AI and its Applications

Objective:

Teaching staff acquire a solid understanding of the fundamental definitions and mechanisms of Artificial Intelligence in order to develop deeper insights into training processes and application methods. They demonstrate proficiency in various AI concepts and critically analyze AI systems within real-world application contexts.

Sub-competence A-1: Fundamentals of Artificial Intelligence

	Acquire	Deepen	Create
Knowledge	Definitions of AI and related terms. Basic functioning of AI models.	Training processes of AI models and the role of different datasets. Commonly used methods for applying models.	Expertise in advanced AI concepts and architecture.
Skills	Recognition of AI applications in everyday life and in educational settings. Understanding the differences between	Comparison and evaluation of different AI technologies and approaches. Assessment of the suitability and limitations of specific AI	Critical analysis of the potentials and risks of emerging AI technologies in higher education. Design of AI-based solutions for

	various types of AI and traditional digital technologies.	tools for teaching and research purposes.	specific challenges. Analysis of the limitations of various AI systems in real-world application contexts.
Attitude	Openness toward AI as a relevant technology for higher education teaching. Awareness of the transformative potential of AI.	Curiosity to explore the functioning and application areas of AI in greater depth. Critical evaluation of AI tools.	Proactive engagement with the societal implications of AI. Commitment to promoting a well-informed understanding of AI.

Sub-competence A-2: Application Domains of AI

	Acquire	Deepen	Create
Knowledge	Typical application areas of AI. The potential of AI in various work processes (fundamentals).	Overview of the use of AI across different application domains and educational contexts.	Future transformative applications of AI in higher education and research.
Skills	Identifying AI tools that are pertinent to the respective academic discipline and teaching practice. Describing the basic functions of various AI applications.	Applying AI tools in selected instructional and research contexts. Evaluating the relevance and added value of specific AI applications in relation to disciplinary needs. Validating AI-generated outputs across diverse domains of application.	Identifying innovation potential through the combination of various AI technologies. Developing and adapting AI applications to address specific problems.
Attitude	Interest in exploring various AI applications. Openness to integrating AI into one's own professional practice.	Reflection on the meaningful use of AI to enhance teaching and research. Awareness of the importance of contextualizing AI applications.	Willingness to experiment with new AI tools and integrations. Critical reflection on one's role within the evolving field of AI applications.

Competence Area B:
Designing AI-Supported Teaching and Learning Processes

Objective:

Teaching staff develop comprehensive knowledge and skills in the use of AI to support instructional planning and preparation, personalize and differentiate instruction, promote engagement and active learning, and design, implement, and evaluate assessments. They systematically employ innovative AI tools, critically reflect on their use, and design tailored learning environments that address the individual needs of students and continuously enhance the quality of teaching.

Sub-competence B-1: Using AI to Support Instructional Planning and Preparation

	Acquire	Deepen	Create
Knowledge	AI use cases that can support instructional	Use of AI in the creation of learning materials and in	Implications of AI for the role of educators in lesson

	planning. Potential of AI to increase efficiency (fundamentals).	diverse instructional settings. Best practices for AI-supported instructional planning.	preparation and its associated pedagogical impacts.
Skills	Use of AI tools to support instructional preparation.	Systematic integration of AI tools into the planning process. Adaptation of teaching and learning materials with the help of AI.	Development of new methods and approaches for AI-supported instructional planning. Combination of different AI tools to create integrated planning solutions.
Attitude	Openness to new technologies in instructional planning. Interest in streamlining tasks through AI.	Awareness of the added value AI can bring to instructional planning. Critical reflection on the use of AI to ensure instructional quality.	Willingness to experiment with new AI-supported planning approaches. Reflection on one's role as a designer of AI-supported learning environments.

Sub-competence B-2: Personalization and Differentiation through AI

	Acquire	Deepen	Create
Knowledge	Opportunities for personalization and differentiation through AI in instruction (fundamentals).	Possibilities for supporting and analyzing diverse learning behaviors using AI.	Use of AI technologies to design personalized instructional settings and to understand their implications.
Skills	Identification of AI functionalities that can be used for personalization and differentiation.	Effective use of AI tools for personalization and differentiation across various teaching and learning contexts.	Use, implementation, and evaluation of the effectiveness of AI tools for the personalization of learning content, along with the adaptation of strategies based on the results.
Attitude	Openness to integrating AI-based personalization options into one's own teaching practice.	Recognition of the added value of personalized learning for student success and the potential of AI to support it. Awareness of the diverse needs of students.	Commitment to creating personalized and needs-oriented learning environments through AI.

Sub-competence B-3: Promoting Engagement and Active Learning with AI

	Acquire	Deepen	Create
Knowledge	Potential uses of AI tools to promote interaction and engagement.	Use of AI to support interactive learning scenarios and to foster collaboration and critical thinking.	Design of interactive and immersive learning environments supported by AI.
Skills	Application of AI tools in teaching to increase interaction and activate students.	Systematic integration of interactive AI elements into courses. Adaptation of AI-supported activities to meet the needs of students.	Design and implementation of innovative AI-supported learning activities that promote active learning and critical thinking. Reflection on one's role as a facilitator

			and guide of active learning processes involving AI.
Attitude	Interest in using AI tools to support student engagement in the learning process.	Recognition of the added value of AI-enhanced interactive learning experiences.	Willingness to experiment with new forms of interaction enabled by AI.

Sub-competence B-4: Applying AI in Assessment

	Acquire	Deepen	Create
Knowledge	Opportunities for using AI in the design, administration, and evaluation of assessments.	Implementation and execution of AI-supported assessments. Awareness of possibilities and limitations in assessment practices.	Impact of AI technologies on the measurement and evaluation of learning outcomes, along with options for adapting to new conditions.
Skills	Use of AI-based tools in the creation of assessments. Consideration of the implications for existing assessment formats.	Effective use of AI tools for designing, conducting, and evaluating assessments across various teaching and learning contexts.	Adaptive adjustment of assessment strategies to new conditions, with AI integrated throughout the evaluation process.
Attitude	Awareness of the implications of AI for existing assessment practices.	Openness to integrating AI across the entire assessment process, balancing both benefits and potential limitations.	Commitment to the continuous improvement of learning assessment through innovative applications of AI.

Competence Area C:
Using AI Ethically and Responsibly

Objective:

Teaching staff develop a deep understanding of ethical principles and data protection requirements in the use of AI. They consistently apply these principles and measures in their teaching practice, promote high ethical standards, and contribute to the development and dissemination of best practices.

Sub-competence C-1: Fundamental Ethical Principles in the Use of AI[2]

	Acquire	Deepen	Create
Knowledge	Ethical principles and guidelines for the use of AI (fundamentals).	Ethical questions and their implications for the use of AI in various contexts.	Advanced ethical concepts and theories related to AI.

	Current ethical challenges and risks.	Legal frameworks and regulations.	
Skills	Identifying and describing fundamental ethical principles in the use of AI.	Applying ethical principles in practice and evaluating their impact across different scenarios.	Analyzing and assessing the ethical implications of emerging AI technologies. Developing and implementing strategies to ensure ethical standards in the use of AI.
Attitude	Awareness of the importance of ethical principles in the use of AI. Interest in engaging with ethical questions.	Critical reflection on the ethical challenges and opportunities associated with AI. Willingness to integrate ethical considerations into one's own practice.	Promotion and implementation of ethical standards in the use of AI. Commitment to the development and dissemination of best practices for the ethical use of AI.

Sub-competence C-2: Data Protection and Security in the Use of AI

	Acquire	Deepen	Create
Knowledge	Data protection principles and security requirements in the use of AI (fundamentals).	Implementation of data protection and security measures in AI applications. Understanding of data privacy risks associated with AI.	Advanced concepts of data protection and security in AI. Ability to assess the data protection and security implications of emerging AI technologies.
Skills	Identifying and describing fundamental data protection and security measures in AI.	Applying data protection and security principles in practice. Evaluating their impact across different scenarios.	Implementing strategies to ensure high standards of data protection and security in the use of AI.
Attitude	Awareness of the importance of data protection and security in the use of AI.	Critical engagement with data protection and security challenges in AI. Willingness to integrate these considerations into practice.	Promotion of high standards of data protection and security in AI. Commitment to the development and dissemination of best practices for privacy-compliant and secure use of AI.

References

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Declaration on the Use of Generative AI

Generative AI was used in a supportive role during the creation of this document:

- During the initial phase for inspiration and idea development.
- During the drafting phase for formulating and summarizing the objectives.

The publicly available tools *Microsoft Copilot, Google Gemini, ChatGPT,* and *Google NotebookLM* were used for this purpose (as of March/April 2025).