Manual on Using AI Tools in Teaching and Learning at UTN

On the Use of ChatGPT and other GenAI tools

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1. Introduction

As part of UTN's ongoing efforts to explore the potential of using Artificial Intelligence (AI) in higher education generally, and in teaching and learning particularly, members of UTN, such as teachers, professors, and the Digital LEAD Lab, collaborated on creating this manual.

It intends to serve as a **resource** for UTN members who are interested in leveraging AI to enhance the student experience. **Students** will find relevant information on how GenAI could be used during their studies in Section 6.1 (students). However, **it is important to keep in mind that the core purpose of higher education is to cultivate the student's capacity for deepening their own knowledge, critical reasoning, analytical thinking, and creative problem-solving. GenAI cannot and should not replace these learning objectives.**

The manual includes suggestions only; always check the syllabus before using GenAI tools. Ideas for areas of application for **teachers** can be found in Section 6.2 (teachers). General opportunities for everyone are listed in Section 3.1 (opportunities).

This document is designed to provide a **short overview** of the current use of AI in higher education, highlighting its benefits and challenges, as well as recommendations for its effective and meaningful integration into UTN's teaching and learning practices.

Please note that this manual is for informational purposes only, and does not constitute legal advice. For guidance on the use of AI in education, including data protection and intellectual property considerations, please consult the tool-specific data agreement (e.g., UTN data agreement with ChatGPT) and seek advice from the legal department.

2. Definitions

To establish an understanding of key concepts in the area of GenAI, this section gives a brief overview of fundamental terms related to Generative Artificial Intelligence (GenAI) models. These definitions provide a foundational framework for comprehending how AI-powered systems function, their capabilities, and their limitations. By distinguishing between different types of AI models and their capabilities roles, this section ensures a precise and consistent use of terminology throughout the document.

2.1 What is Generative Artificial Intelligence (GenAI)?

Generative Artificial Intelligence (GenAI) is an umbrella term for a family of Artificial Intelligence methods that generate novel content of various modalities, such as text, image, video, and audio. Such models are trained with in-context meta-learning, where the context is typically denoted as “prompt”. GenAI models are pre-trained using data crawled

from the web using self-supervised learning objectives, where the model is optimized to predict the next tokens (subwords) of a given sequence of sentences. The GenAI models are further aligned to match human-style questioning and answering through a process known as instruction tuning, and reinforcement learning from human feedback. Furthermore, most recent models use inference-time reasoning by deploying reinforcement learning planning techniques “to think how to answer”.
The term Foundation Models is typically used to represent Deep Learning models that are pre-trained over vast amounts of problems, and generalized out-of-the-box to novel problems without the need to be specifically trained on the novel problems. GenAI models are further categorized into following:

Large Language Models (LLM)

- The prompt is plain text, and the generated content is plain text.
- OpenAI GPT3, DeepSeek V3/R1, as well as OpenAI o1/o3-mini are text-based foundation models.

Multimodal Foundation Models

- The prompt usually combines text and an image, as well as, less commonly speech and signal/sensor data. The generated content can be plain text or multimodal. Within the community of computer vision researchers, the setup is also denoted as image understanding.
- Multimodal foundation models are intrinsically Large Language Models, too, because the prompt can be plain text as well.
- Recent models, such as OpenAI GPT4, GPT4.5, Anthropic Claude 3.7, or Grok 3 are multimodal foundation models.

Image Generation Models

- A subcategory of multimodal foundation models where the generated content is in an image data modality.
- Prominent image generation models are Stable Diffusion, DALL-E 3, DeepSeek Janus, Midjourney, and Adobe Firefly.
- Some image generation models are integrated into multimodal foundation models, e.g., GPT4 integrated DALL-E 3 to generate images based on instruction prompts.
- Audio/Speech Models
- Multimodal foundation models may also be based on audio/speech or combine an LLM with additional speech recognition or text-to-speech models. Accordingly, the input and output of such models are audio signals instead of text.
- OpenAI GPT4.0 Audio is a typical speech-based foundation model.

2.2. Retrieval-Augmented Generation and Agents

To avoid hallucination issues where foundation models generate non-factual data, recent models can retrieve information from reliable sources (RAG: Retrieval-Augmented Generation). Such GenAI models are trained to search in public websites for a particular query and summarize existing information instead of generating novel content. The retrieval process reduces the hallucination effect of foundation models. Furthermore, recent models (OpenAI Deep Research, Grok 3 Deep Research) move the RAG capabilities further, by combining foundation models and search engines. They search the internet for websites containing information on a given "search query prompt", and then use foundation models to summarize and structure the retrieved information concisely. Furthermore, recent foundation models, such as OpenAI Operator act as AI Assistants, or Agents, that carry out a series of tasks on a particular website given an instruction prompt, such as booking a flight ticket.

3. General Question: Why use AI for Learning? What are the Learning Outcomes?

Some readers may ask, why GenAI tools should be allowed for learning purposes in higher education at all. **What can and will students learn by interacting with GenAI applications? What are intended learning outcomes?** The answers will be shown throughout this entire manual. One important learning outcome is that students need to develop AI Literacy Skills, for example, to understand what AI can and cannot do, to critically apply those tools, to comprehend their functionality. In addition, the industry needs personnel with the ability to using AI tools in reflective ways. UTN has the responsibility to educate such a future workforce. Furthermore, Fake News is increasingly threatening communities with manipulated images, videos, and audios flooding Social Media. Detecting and identifying those Deep Fakes and AI hallucinations is a vital skill for democracy. Since all GenAI tools have the potential to generate inaccurate or misleading information, it is essential for students to develop critical evaluation skills and use AI-generated content responsibly. This necessitates deep disciplinary knowledge alongside AI Literacy Skills.

Another question might be, **what the benefit of "talking" to a GenAI tool is, instead of interacting with the professor**. AI is an additional resource to enhance teaching or learning, not a replacement for interacting with a professor. Especially when it comes to availability outside the classroom and office hours, GenAI tools may offer 24/7 support. It

also provides personalized learning experiences, moving beyond a “one-size-fits-all” approach to better support each learner individually.

Furthermore, **how can teachers ensure that student interaction with a GenAI tool supports active or meaningful learning?** The key factor is the course design. For details, go to Section 5; it describes how the course design matters. In essence, the goal is to actively involve students in diverse learning activities beyond listening or reading that help developing the skills and competencies essential for their future.

Finally, **who is responsible, if the GenAI output, generated by a system provided to the students by the university is incorrect?** Throughout this document, the reader is constantly reminded that GenAI can make mistakes, e.g., AI hallucinations. It is the responsibility of the student to carefully check the output, e.g., the accuracy. First studies show, neither a person nor an AI tool achieve the best results, but the person together with the AI tool outperforms them (hybrid human-AI-interaction).

Instructors seeking guidance on AI integration are encouraged to reach out to the UTN Digital LEAD team for support. For inspiration, refer to the link “A design framework for creating AI courses in different disciplines” in the Appendix.

In summary, teachers have the autonomy to decide if and how AI tools are incorporated into their courses. Drawing on their expertise, they determine how AI aligns with their lesson plans and instructional strategies to achieve course-specific learning outcomes. AI functions as a complementary tool that enhances learning but does not replace direct interaction with faculty, which remains essential for a comprehensive and accurate understanding of course material.

4. Examples of Use

The integration of generative AI such as ChatGPT into teaching and learning environments has the potential to change learning. All new (digital) technologies may affect the way humans interact, communicate, network, share information, work, or learn. As McLuhan already wrote in 1967, “First we shape the tools and then the tools shape us”. For example, by personalizing learning experiences and making environments more adaptive and inclusive, GenAI may influence a range of aspects from curriculum design to assessment methodologies (e.g., Ayeni et. al, 2024). Furthermore, chatbots can support teachers and staff in their work by answering commonly asked questions about the syllabus, university policies, and basic course content (depending on the training), reducing the workload of teachers and providing students with quick access to information (e.g., Ramandanis, 2023).

Besides giving the students feedback on their assignments or clarifying concepts, generative AI can also suggest topics or additional material to students based on their performance or interests, offering a more individual learning experience.

4.1. Opportunities

The following list provides some of the opportunities that such tools can bring to teaching and learning. This list is not exclusive, but open to more examples.

Programming and Technical Assistance

- **Code Generation for Fast Prototyping:** Students describe the method in a pseudocode format, and the foundation model generates an early prototype implementation.
- **Code Debugging and Explanation:** Students can input code snippets, and GenAI tools can identify errors, suggest improvements, and explain concepts.
- **Baseline implementation:** GenAI can be used to create a baseline implementation of a model/system that can be adjusted/modified by students for comparison.

Math Proofs/Discussions

- **Understanding Mathematical Derivations:** GenAI can help explain the steps of the sequence of derivations in math-heavy text.
- **Deriving Math Proofs**: GenAI can help to sketch mathematical proofs and analyze the formal aspects of scientific methods.

Student Support and Engagement:

- **Personalized Learning Support:** GenAI can answer common questions about the syllabus, university policies, and basic course content, reducing the teacher's workload and providing students with quick access to information.
- **Chatbot Assistance:** AI can analyze student performance and interests to suggest relevant topics for further study, creating a more personalized learning experience.

Academic Research

- **Checking novelty:** GenAI helps identify whether a research idea is novel by automating the process of searching for papers that have already addressed the same research questions. However, the students still need to discuss the findings with their supervisor.
- **Related Literature Search:** GenAI can help to search for related work, extract arguments, and streamline the literature review process. In particular, the Deep

Research features of OpenAI, Perplexity, Grok allow for a retrieval-augmented summarization of the related work. While the GenAI tools help to quickly search for related work, **it is the responsibility of the student** to read, understand and appropriately cite the related work publications.

Writing Support

- **Paraphrasing and Clarity Improvement:** GenAI can suggest alternative ways to phrase sentences, making academic writing clearer and more concise.
- **Grammar and Spell Checker:** GenAI tools are capable of correcting grammar and spelling mistakes for students by generating corrected content or paraphrases, especially helping students with dyslexia and allowing all students to focus more on the semantics than on the linguistic style.

Creative Writing and Critical Thinking

- **Storytelling and Creative Writing:** GenAI can generate ideas, suggest research prompts and storylines, and provide feedback on writing styles.
- **Philosophical and Ethical Discussions:** Students can discuss ethical dilemmas with GenAIs, where AI takes different positions or roles, allowing students to critically reflect on their point of view.

4.2. Examples of Assignments

This subsection gives some ideas on how GenAI can be used to redefine assignments. This is just a list for inspiration.

Fact-Checking AI-Generated Explanations

Students ask GenAI to explain a complex STEM concept (e.g., NP-completeness, neural networks). They fact-check the response against academic sources, highlight errors, and discuss the quality of the answers provided by the GenAI tool.

Code Debugging Discussion

Students present a piece of buggy code to GenAI and ask for suggestions on improvements. They then discuss GenAI's proposed solutions in small groups, evaluating their correctness and efficiency. Each group explains which solutions they would implement and why.

Ethical Implications Interview Partner

Students assign GenAI the persona of an AI ethics researcher and engage in a discussion

about responsible AI use in computer science. They critically evaluate AI's stance on bias, security, and accountability, comparing it with academic literature.

Debate or Sparring Partner

Students engage in a virtual debate with chatbots like ChatGPT, which will provide arguments and counterarguments on both sides of the issue. They will analyse the arguments and complete a fact check. Students use rubrics to assess both their peers' and the tool's performance.

Interview Partner

Students use generative AI as an interview partner by assigning it a certain persona. They can practice for a job interview, interact with historical figures, etc.

Compare Answers

Students will evaluate AI-generated answers to certain assignments/questions, what is true, what are hallucinations, what are tasks AI can excel at, and what are the limits.

Evaluation Criteria

Students develop rubrics they use to evaluate AI-generated answers.

Create Illustrations or graphics

Students can use AI to create illustrations, graphics, and other visuals to support communication.

Presentation practice

Students can give presentations and ask the generative AI tool to give them feedback according to the grading rubrics.

5. Chances and Risks

As with all technologies in teaching and learning, there are chances and risks involved. However, it is important to keep in mind that the design matters (e.g., Clark, 1983; Doering, Miller, & Veletsianos, 2008). In the context of technology-enhanced learning, the phrase "design matters" emphasizes the importance of how a course or learning experience is structured and organized, for example. It is not just about delivering content remotely; it is about carefully planning the way the content is presented, how learners interact with it, and how they engage with one another and the teacher. Good design can significantly influence the effectiveness and engagement of the learning experience, in both online and in-person settings.

Here is what “the design matters” often refers to:

1. **Course Structure**: The flow of content, how it is organized, and how learners progress through the material. Clear objectives, well-paced modules, and logical sequencing contribute to a more effective learning experience.
2. **Instructional Methods**: Using a variety of teaching techniques, such as multimedia, interactive activities, and assessments, to cater to different learning preferences and keep students engaged.
3. **User Experience (UX)**: Ensuring that the online platform is easy to navigate, intuitive, and accessible for all learners. A smooth, frustration-free experience is crucial for keeping students focused on the content.
4. **Human-Computer Interaction, and Human-Human Interaction mediated by the tool**: Designing opportunities for student-teacher and student-student interaction. Social presence is essential in distance learning, so incorporating discussions, group work, or peer feedback can help create a sense of community.
5. **Engagement and Motivation**: The design should include strategies for motivating learners, such as providing timely feedback, setting clear goals, and using gamification or other techniques to make learning more enjoyable.

In essence, the design of the learning environment – technologically, pedagogically, and socially – has a direct impact on whether students will succeed, feel engaged, and persist through the course.

The integration of generative AI tools presents both opportunities and challenges to such a learning design. However, the integration is necessary since the German business sectors call for employees who are proficient in AI literacy and corresponding technologies (e.g., Rampelt, 2025). This finding highlights the need for higher educational institutions to equip students with the necessary skills to navigate and excel in an AI-driven landscape. By embedding AI literacy into curricula, educators can prepare learners to meet the evolving expectations of the workforce, ensuring they are not only consumers of technology but also informed contributors to its development.

Thus, the adoption of GenAI in teaching and learning necessitates a careful and responsible approach. Educators, instructors, or teaching teams should balance the benefits of AI-enhanced learning experiences with the ethical considerations surrounding data privacy, algorithmic bias, and the potential for over-reliance on automated systems. Developing comprehensive AI literacy involves fostering critical thinking, enabling students to assess and interpret AI outputs judiciously.

5.1 Potentials

The integration of GenAI in teaching and learning offers numerous possibilities for enhancing education at both the institutional and individual levels. This chapter explores how GenAI can be leveraged from institutional, student, and teacher perspectives.

Institutional Perspective

The integration of AI in teaching and learning also has the potential to change the way Higher Education Institutions educate students, for example, by **personalizing learning experiences** and providing students with more tailored support and feedback.

Student Perspective

Furthermore, using AI in the educational setting allows students to experience and reflect on the possibilities it brings, the advantages, and the disadvantages. They experience first-hand how fallible AI-generated texts can be and therefore how important their expertise and **critical reflection** are. By the time they graduate, they will be AI literate.
Students can use GenAI to **improve their writing skills** by getting feedback on their outline, structure, and writing style. They can interact with the AI, asking for tutorial support through clarifications, hints, and examples. It can help students improve their research skills by using GenAI to summarize texts, create visualizations, and organize their findings.

Teacher Perspective

GenAI can be used as a tool by teachers. For example, it can help to **automate routine administrative teacher tasks**, freeing up teachers to focus on more complex and human-centered aspects of teaching. AI can help the teachers to create more authentic and realistic assignments and assessments, such as simulations and virtual labs, that provide students with a more immersive and engaging learning experience.
By incorporating AI into teaching and learning, educators can help students develop a deeper understanding of AI concepts, algorithms, and applications, as well as the potential benefits and limitations of AI. This, in turn, can improve **AI literacy**, enabling students to make informed decisions about the use of AI in various contexts.
Generative AI can also be used to **enhance assessment and feedback** in teaching and learning. For example, AI can generate false answer options for quizzes and exams. It could also be used to conduct personalized interviews with students to check their understanding of a topic. These interviews can be tailored to individual learning needs, helping to identify knowledge gaps and provide targeted feedback.
Additionally, AI can be used to **facilitate discussions in the classroom** by generating thought-provoking questions or scenarios. Answers created by tools such as ChatGPT can

serve as a starting point for discussions, allowing students and teachers to explore what is correct, what might be misleading, and what requires further clarification. This approach not only encourages critical thinking but also helps students develop their ability to evaluate information effectively.
Generative AI can also be used to create **interactive and engaging learning experiences.** For example, AI can be used to develop simulations and materials for problem-based learning courses. These simulations can mimic real-world scenarios, allowing students to apply theoretical knowledge in practical contexts. It can serve as a baseline implementation for coding tasks, providing students with a foundation to build upon while they work on more complex projects. In such a way, Generative AI may help to **enhance student engagement and motivation**.

5.2 Risks

All members, including faculty, administrative staff, policymakers, and students need to be aware of the potential pitfalls of using AI in educational settings.

Plagiarism and Non-Reproducibility

One of the most significant concerns is plagiarism and non-reproducibility. When students use AI tools to generate content, it can be challenging to determine the originality of the work and whether the student has truly understood the course material. Additionally, the extensive use of GenAI tools can lead to a shallow understanding of course topics, as students may rely too heavily on AI-generated content rather than engaging with the material themselves.

Academic Integrity and Cheating

The use of AI in higher education also raises concerns about academic integrity and cheating. With the increasing use of AI tools, there is a risk that students may use these tools to generate content that is not their own or to cheat on assessments.

Biases

Furthermore, AI systems can perpetuate existing inequalities and discrimination, as they may be biased toward certain groups or individuals (depending on their training). This can lead to unfair outcomes and exacerbate existing social and economic inequalities.

Privacy, Data Protection, and Security

Moreover, the use of AI in education also raises concerns about privacy, data protection, and security. If student data or their research results are being collected and analyzed, there is a risk that this data may be misused or compromised. All users need to be aware of these concerns and take steps to mitigate them.

How to Cite the Results of GenAI Tools

When using AI tools, such as chatbots or autocompletion software, it's essential to consider how to **cite** the output. For example, if a student uses GenAI to generate code, should they cite the tool as a source? While storing every prompt or interaction with AI tools may not be practical, individual instructors may choose to require students to document their use of such tools. In these cases, clear expectations should be communicated, and mentioned in the syllabi. It's also important to recognize that relying heavily on AI tools can sometimes shift focus away from the underlying learning objectives. For example, using AI to create a multimedia presentation might overshadow the comprehension of key scientific concepts. Using AI tools requires a balanced approach in which these technologies serve as supplements to, rather than substitutes for, deepening knowledge, critical thinking, and active engagement with the subject matter.

Ethics and Responsibility

Finally, educators need to consider the ethics and responsibility of using AI in education. Who owns the output of an AI tool? Who is responsible for the content generated? These are important questions that need to be addressed. Educators must be aware of the potential consequences of using AI in education and take steps to ensure that AI tools are used responsibly and ethically. By being aware of these potential pitfalls, educators can develop strategies for using AI in education effectively and promoting deep learning and understanding.

Compliance with the European AI Act

When designing and implementing AI-powered tools for teaching and learning, compliance with the AI Act has to be ensured. This includes ensuring that AI tools are designed and implemented in a way that is transparent, explainable, and fair. AI tools must be used in a way that respects students' rights and dignity, and that they are not used to perpetuate existing inequalities or biases. By taking a responsible and ethical approach to AI use, UTN wants to ensure that AI is used in a way that enhances teaching and learning, while also promoting student well-being and success.

6. Recommendations for Using GenAI

Generative AI has the potential to support both students and teachers, but **responsible use** requires awareness of ethical, pedagogical, and privacy-related challenges. This section outlines recommendations to help students and teachers integrate AI tools effectively while maintaining academic integrity and fostering independent learning.

6.1 Students

When using AI-powered tools in academic settings, it is essential to ensure that students are aware of the responsible use of these tools–before, during, and after their use. Using AI is not a replacement for interacting with a professor; rather, it should be seen as a resource to complement academic discussions and guidance. As all GenAI tools can hallucinate, students need to critically evaluate AI-generated content and use it responsibly to support their learning process.

Before Doing an Assignment

Before using GenAI tools for assignments, students should first review their syllabi to ensure they comply with course-specific guidelines. These tools should support or enhance learning, not replace or hinder it. The primary goal remains for students to understand the given problem and develop the necessary skills to solve it, along with other intended learning outcomes. GenAI should enhance, not obstruct, the learning process; students should focus on understanding the problem and applying methods to solve it. This also includes learning about the limitations of GenAI as well as learning how to craft effective prompts to achieve meaningful results. (For more details, go to "Courses and Learning Platforms" in the appendix.) Students should also be mindful that relying on GenAI for assignments can create a false sense of understanding — after all, not everything generated by AI is accurate, instead those machines may 'hallucinate'. Students may not immediately recognize this, which can ultimately hinder their learning progress. Therefore, students should familiarize themselves with the AI tools provided by UTN and, just as importantly, learn how to use them effectively.

During Class

By learning how to prompt, students can, for example, ask a chatbot to act as a tutor. Generally, AI can support students, e.g., by generating ideas, creating sample data, identifying patterns, or developing hypotheses. These findings could be used as a foundation for their research and writing. By carefully considering when and how to use AI, students can leverage its capabilities while maintaining control over their learning and demonstrating their understanding and critical thinking skills. However, students also need to be aware of what data and personal information they can upload. Furthermore, students should be aware of the location of the servers that store their data, the materials used to train the AI models, and who owns the AI models and the data they collect.

After Getting a Response from GenAI

After receiving the response, students need to evaluate the answers. Are there any hallucinations, are there any biases, and is the use not considered good scientific practice

(e.g., regarding citation). They need to be aware that they are fully responsible and accountable for the content they hand in, and, thus, for reviewing all AI-generated content. When in doubt, UTN recommends that students consult their teachers.

6.2 Teachers

Teachers may use AI to streamline administrative tasks, and they may use it to personalize teaching and learning, for example, by creating different teaching materials, assignments, and lesson plans, leaving more time for interaction with the students.

Table 1 below outlines these specific tasks GenAI can assist teachers with, mapped to the different phases of teaching: Course Planning and Design, Course Delivery and Engagement, and Assessment and Feedback

Table 1. Teaching phases and possible GenAI assistance

Teaching Phases	GenAI Functions	Possible GenAI Assistance
1. Course Planning and Design	Content Generation	Generate syllabi, lesson plans, lecture notes, slides, and reading lists
	Curriculum Development	Suggest course structures, module breakdowns, and sequencing of topics
	Personalized Learning Materials	Create alternative explanations, adaptive exercises, and content summaries tailored to different learning levels
	Automating Administrative Tasks	Draft course announcements, emails, and instructional guidelines
2. Course Delivery and Engagement	AI-Powered Tutoring and Q&A	Provide instant responses to student queries, generate explanations, and offer additional examples
	Lecture Enhancement	Generate summaries, discussion prompts, and interactive case studies
	Real-Time Adaptive Content	Adjust learning materials based on student progress and comprehension levels (if possible)
	Interactive Learning Activities	Create AI-driven quizzes, simulations, and role-playing scenarios
	Content Translation	Convert lecture materials into different languages

	Automating Communication	Generate email responses, reminders, and discussion board interactions
3. Assessment and Feedback	Automated Assessment Creation	Generate quiz questions, essay prompts, and problem sets based on course material
	AI-Assisted Feedback	Provide feedback on essays, projects with AI consultation
	Comparative Analysis for Learning	Help students compare AI-generated responses with their own analysis to improve critical thinking
	Academic Integrity Support	Assist in verifying the originality of student work and identifying AI-generated content
	Student Reflection and Process Documentation	Encourage students to document their thought process, decision-making, and AI use in assignments

In addition to the examples in the table, and to effectively integrate GenAI tools into teaching and learning, UTN recommends several action items as outlined below.

First, teachers may focus on developing their AI literacy, see details in the appendix of this document. Understanding how AI models generate responses, their limitations, and potential biases is crucial for guiding students in their responsible use. Exploring AI tools, experimenting with different applications, and staying informed about advancements or ethical considerations are key to integrating GenAI into teaching and learning. Future professional development programs and future collaborative learning communities can support teachers in gaining confidence with AI, ensuring they can leverage it meaningfully in their teaching practices.

Secondly, teachers may establish clear guidelines for AI use in their courses. These include when and how students are allowed to use AI tools, how to properly cite AI-generated content, and what constitutes appropriate versus inappropriate use. Examples of what these guidelines might look like can be found in the appendix of this document. The syllabus also contains pre-formulated options for regulating the use of AI in courses. Talk to the students about the course-specific policies to ensure what is expected of them.

Third, teachers may develop new forms of assignments to incorporate AI as a learning aid rather than a replacement for autonomous thinking — for instance, by having students

compare AI-generated responses with their analysis or by critically assessing the accuracy of AI-generated information.

Finally, encourage students to reflect on issues such as bias in AI models, misinformation, or potential copyright infringement. Creating opportunities for students to engage in debates, case studies, or research projects on reflective AI use will deepen their understanding and prepare them for the responsible use of AI in professional and academic settings.

In a nutshell, by adopting a balanced approach that emphasizes both the opportunities and risks of AI, teachers can help students develop the skills and reflective awareness necessary for success in an AI-driven world.

6.3 Graded Assignments and Assessments

Teachers may use AI to create dynamic and personalized assessment formats, e.g., adaptive quizzes, case studies, or scenario-based tasks. Please keep in mind, when using AI to generate feedback for assignments, teachers need to ensure the generated feedback is correct, particularly in areas requiring nuanced evaluation, such as critical thinking, creativity, or originality. Students should be guided on the responsible use of AI in assignments. For example, while AI may assist in brainstorming or organizing ideas, the submitted work must reflect their understanding and effort. To check for understanding, the teachers can ask not only for the completed assignment but also for a description of their process (for example, how they solved the problem) and present their results in front of their peers or the class.

7. How to Cite AI-generated Work

If students are, depending on the course and assignment, allowed to use GenAI, they must cite the work appropriately. In general, citation expectations and citation styles vary depending on the academic discipline. Students should always refer to their course syllabus and consult their teachers to ensure compliance with specific requirements.

If generative AI has been used as part of the research process, UTN recommends that the use should be transparently documented in the submitted assignment, paper, or any other scholarly work. The level of the citation detail required depends on the extent of its use and the conventions of the corresponding discipline. The following sections provide two different citation conventions. If a different citation style is used, other guidelines might apply. Further useful references can be found in the appendix.

7.1 APA Style

According to APA Style, AI-generated text that is used without modification should be treated as a direct quote. For instance:

> "When prompted with '[ADD PROMPT],' the ChatGPT-generated text indicated that '[ADD QUOTE]' (OpenAI, 2025)."

The corresponding reference entry should follow this format:

> OpenAI. (2025). ChatGPT (Mar 14 version) [Large language model]. https://chat.openai.com/chat.

Further guidance can be found on the APA Style Blog.

7.2 IEEE Style

Since the IEEE has not yet published official recommendations, the Chicago Manual of Style serves as a reference. In this format, ChatGPT is considered the "author," OpenAI (the developing company) is the publisher, and the date corresponds to when the response was generated. If the prompt is not included in the main text, it can be incorporated into a footnote. For example:

> "ChatGPT, response to '[ADD PROMPT],' OpenAI, February 26, 2025."

Because AI-generated responses are not reproducible via a stable URL, ChatGPT citations do not need to be included in the bibliography. More details can be found in the Chicago Manual of Style.

7.3 Recommendations for How to Cite Coding

There are several options available for citing tools like GitHub Copilot and others that help with coding or provide autocomplete suggestions.

1. **In-Text Acknowledgements:** These are important for making use of AI tools transparent.
    a. Comments within the code:
        # This function/class/... was partially generated using GitHub Copilot
    b. Comment elsewhere in a paper, assignment, thesis, Selbstständigkeitserklärung:

> “Some portions of the code were generated with assistance from GitHub Copilot, an AI-powered code completion tool. The final implementation was reviewed, modified, and validated by the author.”

2. In-Text or Other Formal Citation: Add an official citation where needed and use a format similar to software documentation, e.g.:

a. APA (7th edition):

> GitHub Copilot. (2024). *AI-powered code completion*. GitHub. https://github.com/features/copilot

b. IEEE:

> GitHub Copilot, "AI-powered code completion," GitHub, 2025. [Online]. Available: https://github.com/features/copilot.

3. Methods section, Footnote or Appendix: Detailed acknowledgements when and how GenAI was used.

> “Several code snippets were suggested by GitHub Copilot. The tool was used for function scaffolding and logic generation, but all outputs were reviewed and refined.”

8. Conclusion and Outlook

This document is envisioned as a living document that will be continuously updated to reflect advancements in AI and its implications for teaching and learning. Given the rapid development of GenAI technologies, this manual must evolve dynamically, incorporating new tools, pedagogical strategies, and other considerations as they emerge.
By adopting a collaborative and iterative approach, the university ensures that this manual remains an authoritative and adaptable resource, supporting its commitment to academic excellence and leadership in educational innovation.
To effectively navigate rapidly evolving GenAI in higher education, it is essential to approach its use with both curiosity and responsibility. As UTN wants to integrate these technologies into teaching and learning, certain key principles should guide our efforts. The following takeaways summarize the core messages of this manual, highlighting the shared responsibility of students, teachers, and institutions in ensuring AI serves as a valuable and ethical tool in academia.

Accountability for AI-Generated Content

Regardless of how AI tools are used, the responsibility for verifying their output lies with the user. Students and instructors must critically assess AI-generated content for accuracy, bias, and relevance. When AI-generated material is incorporated into academic

work, it must adhere to good scientific practice, including proper citation and transparent documentation of AI involvement. Ensuring the correctness and reliability of AI-assisted work is essential to maintaining academic integrity.

Responsible AI Use Requires Continuous Adaptation

As AI capabilities evolve, so must UTN's approaches to using them in education. Both students and instructors should remain informed about AI's strengths, limitations, and ethical considerations to ensure its responsible and effective integration into teaching and learning.

AI is a Tool, not a Substitute for Critical Thinking

While GenAI can enhance learning by providing feedback, generating ideas, and assisting with tasks, it should never replace independent reasoning, problem-solving, or academic integrity. Effective AI use requires human oversight, critical evaluation, and thoughtful application.

Collaboration and Ongoing Discussion Are Key

The impact of AI in higher education is still unfolding. Open dialogue among educators, students, and policymakers is essential to shape best practices, refine assessment methods, and ensure AI supports meaningful learning experiences rather than undermining them.

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Appendix - Links and Resources

This section contains links and resources that might be useful as references for getting an idea of how to approach certain questions. This is a living section, which means that it will be updated continuously. Please do not hesitate to contact lead-lab@utn.de if you would like to have some resource added here.

Tool Recommendations

- KI-Tools für wissenschaftliches Arbeiten (german)

- Documents, Manuals and Resources of Other Universities
- Universität Basel - Leitfaden 'Aus KI Zitieren' (german)
- Pädagogische Hochschule Heidelberg, Prof. Dr. Christian Spannagel: 'Rules for tools'

- AI in teaching, learning, and exams
- AI Campus: Learning platform for artificial intelligence
- Alce Your Exams - Generative KI als Copilot im Schul- und Unialltag (german)
- A design framework for creating AI courses in different disciplines
- Generative Artificial Intelligence (GAI) Literacy Framework