Universität Hamburg Orientation Framework for Using Generative Artificial Intelligence System in Studies and Teaching

Advisory group on digitalization in teaching at Universität Hamburg[1]

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Purpose and overview

This document serves as an orientation framework for using generative artificial intelligence (GAI) in teaching and studies at the University. It outlines potential for using GAI in teaching and studies under the guiding principle of "Education through science and scholarship" (https://www.uni-hamburg.de/en/uhh/profil/leitbild/lehre.html). This framework is formulated on the assumption that the GAI field will continue to develop dynamically. Therefore, it will be regularly (every semester) reviewed and updated by the advisory group on digitalization in teaching for the Executive University Board.

Universität Hamburg's orientation framework for dealing with GAI is aimed at faculties, departments, and subjects. Within the defined framework, they can and should make their own specific teaching, learning, and examination recommendations and identify the need for regulation. They are also responsible for communicating these recommendations to students in a suitable manner. The specifics also need to be regularly reviewed and updated for the faculties, departments, and subjects.

By way of introduction, the term "generative AI" is defined for the context of the orientation framework. The following sections discuss didactic principles for the use of GAI in studies and teaching at Universität Hamburg on an interdisciplinary level. The framework is supplemented by detailed appendixes with information on examination, copyright, and data protection law in the context of GAI usage. The appendix also contains two suggestions on how students can document the use of GAI in term papers and the like.

Definition of "generative AI"

For the context of this orientation framework, we understand generative AI (GAI) systems as digital tools whose technologies are based on machine learning. They generate output in various media formats (e.g., texts, images, audio or video files) based on very large datasets or further process data that has been entered by users. GAI systems are driven by users' requests—so-called prompts. In response to prompts, for example, text-generating AI systems produce texts based on statistical information about language (sequence patterns, composition structures). Large language models (LLMs) are at the heart of text-generating AI

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systems. LLMs are based on artificial neural networks, a complex method of machine learning. These artificial neural networks are used to develop language models from huge training datasets that are able to imitate human language behavior and perform various text operations (answering, continuing, summarizing, translating, converting, etc.). ChatGPT, a language model trained on human conversation, is a prominent example of an AI text generator.

The inherent structure of AI systems means output is unique and cannot be reproduced verbatim. A new, similar or identical prompt will generate a similar response but not the same one.

Basic considerations for the use of GAI systems in education

GAI is not a fleeting phenomenon, and it is a technology with manifold effects on all areas of society, that will significantly influence social development in the future. Therefore, universities must actively shape the development and use of GAI not only in research but also in studies and teaching. Universität Hamburg is thus faced with the task of

- continuously engaging with GAI both on an interdisciplinary and subject-specific level in studies and teaching and contributing to developments in this field with its own objectives
- integrating GAI into the content and methodology of teaching in order to develop skills for its critical and responsible use
- optimally supporting teachers and students in applying and responsibly designing GAI systems in accordance with the rules of good academic practice.

In studies and teaching,

- GAI usage can thus be actively tested and practiced in teaching-learning settings in accordance with the objectives and content of a degree program
- GAI usage should be tailored to the respective skill level of the students and the study phase
- the nature and scope of GAI usage should be made transparent in course descriptions.

If GAI systems are used in teaching and learning,

- equal discussion should be given to the benefits and potential of these technologies as well as their risks
- the consequences for students' skills development (e.g., in academic writing or critical thinking) should always be reflected upon, and GAI should be used in a manner that promotes the development of these skills
- suitable didactic methods are developed to stop the use of GAI systems preventing or discouraging the learning or maintenance of skills that are deemed valuable or important and/or defined in the qualification objectives (de-skilling)
- care must be taken to ensure the rules of good academic practice also apply to the use of GAI systems and that suitable methods are found to document their use (see the recommendations for lecturers and students below)
- ethical problems should be addressed appropriately, such as the reproduction of stereotypes in GAI systems and fairness of use of GAI systems at the local and global level.

In the following section, options for the productive use of GAI in teaching and studies are formulated on a general (interdisciplinary) level.

Options for didactic use

Considered and educationally motivated use of GAI systems is an integral part of future-oriented university teaching that optimally prepares students for future roles in society, work, and research. Because GAI systems are widely available, it is necessary to further develop studies and teaching as well as the associated examination formats. This will be carried out differently across disciplines and subjects. The following options set a broad interdisciplinary framework within which faculties, departments, degree programs, and individual lecturers can develop and specify their own guidelines or requirements. These options are intended to provide ideas for determining faculty- and subject-specific recommendations.

In studies and teaching, conditions should be created that support the responsible and reflective use of GAI systems in accordance with legal requirements. Lecturers have a particular didactic and moral responsibility in this process. For lecturers—including in their role as researchers—and students, it is important that they

- take a reflective and responsible approach to AI and are aware of and take into account its limitations and error sources
- always check the accuracy of AI-generated content, for example, by checking its plausibility or using additional sources
- use AI exclusively in compliance with regulations and legal requirements, such as examination regulations, study regulations, and data and copyright protection in studies, teaching, and research
- reflect and adhere to the principles of good academic practice when using GAI systems
- weigh up the benefits of intensive, regular use of GAI against the risk of a loss of skills
- reflect on the social constraints and consequences of GAI usage
- keep up to date with the development of GAI and make use of training opportunities offered by the faculties and centralized institutions (e.g., Hamburg Center for University Teaching and Learning, including the Writing Center) and other decentralized institutions.

Specifically, lecturers can, among other things

- trial GAI systems to familiarize themselves with their possible uses and develop ideas on meaningful and legal use of these systems in their own teaching
- create and test application scenarios for GAI based on their teaching objectives and content and discuss them with students and colleagues
- explain to students the reflective use of GAI as source of support for dealing with various tasks and enable them to do so within a comprehensive framework
- introduce students to using GAI in subject-specific research processes and raise their awareness about the possibilities and limitations of action
- make GAI the object of analysis and research in the respective discipline
- try out GAI as a form of support for creating teaching materials, assignments, and examinations; critically review its suitability; and exchange ideas with colleagues
- take advantage of qualification programs offered by their faculties and the Hamburg Center for University Teaching and Learning, including the Lehre Navi portal (https://www.uni-hamburg.de/lehre-navi.html) and receive support whilst experimenting with GAI.

Among other things, students can use GAI

- to initiate and improve writing processes, for example, by generating topic ideas, getting help with linguistic expression, or translating text passages

- to individualize and structure learning content—for example, by compiling or enriching available content according to their own needs—or to create individual learning plans
- as a supportive interaction partner when working on creative tasks—for example, to enrich their own ideas—to discuss issues, or to find counterarguments
- to revise and improve their own work, for example, by checking a program code.

However, individual teachers taking the initiative to use GAI in their courses is not enough; it is also necessary to embrace AI developments in degree program curricula and content. In doing so, it is necessary to check whether skill requirements are changing in the profession being studied, in society as a whole, and in the field of research, and what this means for personal development. We can assume that at least the following subject-specific skills are and will remain important:

- digital and data skills
- language and text skills
- assessment, evaluation, and reflection skills
- methodological skills and ethical skills.

Therefore, those responsible for a degree program should regularly check that the degree program objectives defined in the subject-specific provisions and the qualification objectives in the module descriptions are up to date and, if necessary, adapt them by means of a faculty council resolution.

Appendixes

1 Information on Examination Regulations

1.1. Examinations in which the use of GAI is permitted

1.1.1. Determining the permissibility of GAI as an aid

For each examination, the examiner or examinations board must decide whether to permit GAI systems to be used as aids. For examinations not administered under supervision—such as take-home examinations—those taking the decision on permissibility should be aware that it is difficult, if not impossible, to legally prove (nonpermitted) use of GAI systems. In this context, it would appear sensible to permit the use of GAI systems as aids for examinations administered without supervision. Suitable guidelines should ensure students can still be regarded as having completed examinations independently and GAI use is appropriately documented (see below).

The examiner and/or examinations board will determine which specific aids are permitted to satisfy the requirements for completion in accordance with the relevant examination regulations and announce this before the examination. The consequences involved in using nonpermitted aids during examinations are stipulated in the examination regulations. In principle, using nonpermitted aids during an examination will result in the grade "insufficient" or "fail" being awarded.

1.1.2 Impermissibility and labeling requirement

The permissibility of GAI as an aid ends where not insignificant portions of the submitted examination stems from text generators and where these portions of text are not labeled as such. What is deemed to be "not insignificant" differs from subject to subject and, therefore, must be discussed within the faculties, departments, and subjects. The final decision is at the discretion of the examiner in light of a subject-related understanding.

In any case, the use of GAI must be transparent. The faculties, departments, and subjects must specifically regulate how GIA material should be labeled or proven. The following guidelines can contribute to this:

- If the output of GAI systems is adopted (e.g., paraphrasing or analogous), any such adoption of text in the work must be explicitly and suitably labeled and documented. Verbatim adoption of output text is strongly discouraged.
- If GAI systems are used to (further) process your own texts or data, the tools used must be listed summarily in the work, stating the purpose of use—for example, in a directory.
- If GAI systems are used as search assistants for a paper—for example, for literature searches—the use of such systems must also be documented in a list.

The appendix to this document contains examples of such required documentation and can be supported by specifying lists or other documentation formats.

1.1.3 Responsibilities

Ultimately, if the use of GAI systems is permitted as an examination aid, and if students actually use GAI systems, the students are responsible for the content generated, compliance with copyright regulations, and the academic integrity of their work.

1.1.4 Declarations of authorship

The Universität Hamburg examination regulations contain rules on the declaration of authorship when submitting examinations. At present, these mostly relate to final theses and take-home examinations; however, these regulations can relate to all types of examination if the examination regulations expressly provide for this. With the declaration of authorship, students confirm that they have written the work independently and have not used any aids other than those specified. In general, the use of GAI systems is thus already included.

Nevertheless, in order to reduce uncertainties with regard to the interpretation of the term "independence," it should be defined in more detail in the faculties, departments, and subjects. It is advisable to test and discuss the suitability of the provision in direct application of GAI. Students should be involved in the process wherever possible.

A useful element of such a provision might be to develop a format for listing the aids used — for example, a list that enables systematic documentation of which technical aids were used and to what extent (see the examples in the appendix to this orientation framework).

1.2 Examinations in which the use of GAI is prohibited

If the use of GAI systems is to be prohibited in examinations (for various reasons), it is advisable to

- formulate tasks that cannot be meaningfully solved with GAI
- shift the focus of examinations from product assessment to the assessment of the learning or creation process — for example, by requiring students to document and/or reflect on the processes
- review written work with the help of in-person discussions or replace it with oral examinations, provided the subject-specific provisions allow (if necessary, these are to be adapted accordingly)
- choose alternative forms to written examinations — such as presentations, infographics, podcasts, or videos — provided that the subject-specific provisions allow (if necessary, these are to be adapted accordingly)
- conduct examinations synchronously in person and under supervision.

2 Copyright information

2.1 Authorship of GAI-generated works

In accordance with the provisions of the Act on Copyright and Related Rights (Gesetz über Urheberrecht und verwandte Schutzrechte, UrhG), GAI cannot generate works protected by copyright within the meaning of Section 2 subsection 2 UrhG. This requires a human creative activity. For this reason, GAI-generated works are generally in the public domain — that is, they can be freely used by the general public. In contrast, users can be considered authors of the work if they merely use GAI as a tool for their own creative activity. Here, the decisive factor is

a significant degree of intellectual contribution and influence in the creation process. The level of creation must also be expressed in the works.

2.2 Copyright-protected content in GAI-generated works

If there are clear indications that GAI-generated works also contain third-party-protected content, particularly in terms of verbatim adoption, users must check this with due care—for example, with a plagiarism scanner. Verbatim adoption is permissible only where such material only represents a small part of the generated work, is completely absorbed into the work, and is no longer recognizable in the new context. In individual cases, the users must have the required contractual or legal rights to use this protected content, particularly if making it publicly accessible to third parties.

2.3 Authorship of prompts

Prompts can be protected by copyright as so-called text works. Simple and typical prompts are not protected, because the technical function predominates, and there is a requirement of availability for third parties. However, detailed prompts in which users provide creative content and thus make creative decisions may be protected by copyright.

2.4 Copyright-protected content in prompts

If prompts also contain third-party content in addition to work instructions, users must check in each individual case whether they have the required contractual or legal rights to send the protected content in the prompt to the GAI provider.

2.5 Labeling obligations

The software's licensing conditions or terms of use may impose a labeling obligation for GAI-generated works. Violations may result in damages payments or to a future exclusion of use. Therefore, the terms of use must be checked. A labeling obligation may also arise from the relevant examination regulations, bylaws, and other Universität Hamburg framework regulations, particularly from the declarations of authorship for examinees and the rules of good scientific practice for academic staff. Violations may constitute an attempt to deceive or academic misconduct and entail the corresponding consequences.

2.6 Use of GAI by lecturers for assessing examinations

Copyright and examination law must be observed when lecturers use GAI to assess their students' examinations. Examinations are protected by copyright and may not be entered into a GAI system if the data is to be used as training data or otherwise. In terms of examination law, be aware that examiners must be carry out the assessment themselves and not by using GAI. Thus, GAI can be used only as a correction aid. The specific provisions in the respective examination regulations and training laws are decisive in individual cases. To date, these do not include a corresponding labeling obligation for lecturers when using GAI as a correction aid.

2.7 Text and data mining

Text and data mining refers to the automated analysis of individual or multiple digital or digitalized works in order to obtain information about patterns, trends, and correlations in the

data. A copyright-relevant act arises in the use of GAI primarily when a corpus created by text or data mining is used to train a GAI system. When using GAI in teaching, which also implies its training, the relevant provisions of copyright law must be observed.

2.8 Legal consequences of copyright infringements

Copyright infringements may result in claims for injunctive relief, damages, and reimbursement of the costs of issuing a warning. In order to minimize liability risks, plagiarism scanners can be used after the works have been generated. Whether claims can be made only against Universität Hamburg or also against the users depends on the individual case. To date, no such proceedings are known in Germany; initial proceedings been brought by authors directly against GAI providers only in the United States.

3 Data protection law

3.1 Data protection only for personal data

Data protection regulations must be observed only if personal data is used when using GAI. This applies to registration data for the use of a GAI, the input (i.e., the input for training and output purposes), and the output itself, especially when published with third parties.

With regard to ChatGPT, personal data may not be used until the German supervisory authorities have completed their review of whether the processing of personal data in ChatGPT is lawful at all and the Universität Hamburg Executive Board expressly permits the use of ChatGPT using personal data.

Personal data includes all information that directly or indirectly enables a person to be identified. This includes, for example, not only content data (prompts) and login data but also metadata (e.g., IP address). Indirect personal reference may result from additional information, for example, in the case of pseudonymized data. This is not the case when using anonymized data, which is why only anonymous data should be used if in doubt.

Irrespective of data protection, it may be necessary to comply with other regulations, such as copyright, personal rights, and the confidentiality.

3.2 Access to GAI

Where GAI cannot be accessed via Universität Hamburg, its use in teaching cannot be made mandatory for lecturers or students. If necessary, exceptions may be made on a case-by-case basis for special teaching and learning areas of GAI, as long as compliance with data protection regulations can be ensured.

3.3 Data protection settings

GAI providers from third countries, such as OpenAI, already offer options for adapting at least some data protection settings to EU data protection law. Corresponding settings can be made on the platforms. This is possible with ChatGPT under "Settings > Data control"—for example, to deactivate the chat history or the training data. It is recommended that you adopt these settings. However, this setting does not yet comply with the principle of data-protection-friendly default settings, as they must be implemented by the user, and are not activated by default.

3.4. Responsibilities

If GAI services (e.g., ChatGPT) are offered directly to end customers (e.g., lecturers and students), the provider (e.g., OpenAI) is responsible for the processing of the data under data protection law. If public authorities (e.g., Universität Hamburg) integrate GPT technology into their systems via the OpenAI API, they are considered to be the controller in terms of data protection law. In this case, OpenAI acts as a service provider and processor.

3.5 Principles of data protection law

Data controllers must ensure compliance with the legal principles listed in Article 5 of the General Data Protection Regulation (GDPR): Lawfulness, fairness of processing, transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, confidentiality, and accountability.

3.6 Legality of data processing

According to Article 6 paragraph 1 GDPR, the processing of personal data is lawful only if there is a legal basis. Possible legal bases are consent (letter a) or the performance of a duty in the public interest (letter e)—in this case the teaching duty.

Both are subject to strict data protection requirements, which are (still) problematic in the legal examination but are unlikely to result in potential conflicts in practical use by lecturers and students. In the case of ChatGPT, the legal basis for consent is currently still likely to be problematic, as the question of voluntariness arises on the one hand, and—in particular—the question of transparency with regard to the information of those affected is still open on the other hand. The legal basis for the performance of a task in the public interest must expressly include a purpose-related examination of the necessity and, when weighing up the interests of teaching, outweigh the interests of the data subject.

3.7 Particularly sensitive data

Article 9 GDPR stipulates special conditions for the processing of so-called special categories of personal data that reveal racial or ethnic origin, political opinions, religious or ideological convictions, or trade union membership, as well as genetic data, biometric data for the purpose of uniquely identifying a natural person, health data, or data concerning a natural person's sex life or sexual orientation.

The processing of sensitive data is generally prohibited in accordance with paragraph 1 unless it is exceptionally permitted in accordance with paragraph 2, in particular on the basis of express consent (letter a). Here, too, it is currently not possible to obtain informed and therefore effective consent in view of the lack of transparency. A further exception to the processing prohibition concerns personal data that the data subject has obviously made public (letter e).

3.8 Transmission of data to a third country

Irrespective of the question of the legal basis, personal data may not be transferred to a third country if there is no adequate level of data protection and if the GAI provider offers no security guarantees. In the case of the United States, there was a new adequacy decision in July 2023, but it only applies to providers that are certified under the new EU-US Data Privacy Framework (https://www.dataprivacyframework.gov/s/participant-search/), which is not

(yet) the case with OpenAI. Other suitable guarantees are not (yet) available for the end-customer version of ChatGPT but are available for the OpenAI API version (standard contractual clauses).

3.9 Utilization of GAI

The processing of personal data within GAI is prohibited unless explicitly permitted for individual services by Universität Hamburg regulations. If you have any questions about a specific procedure, contact the person responsible for the procedure or the unit responsible if there is no such person (research: ZFDM; teaching: campus management).

4 List of GAI systems used in an examination

This list can be used as a template to provide additional or more detailed information beyond the declaration of authorship.

In this thesis, I have used GAI systems as follows:

- not at all
- for generating ideas
- for creating the outline
- for creating individual passages, which total . . .% of the entire text
- for developing software source texts
- for optimizing or restructuring software source texts
- for proofreading or optimizing
- for other things—namely, . . .

I declare that I have provided full details of all uses. I am aware that missing or incorrect information may be considered an attempt to deceive.

Source: https://www.uni-goettingen.de/en/674738.html

5 Tabular list of GAI systems used in an examination

This table can be used as a template to provide additional or more detailed information beyond the declaration of authorship.

Source: https://www.uni-hohenheim.de/fileadmin/uni_hohenheim/Studierende/Studienorganisation/Pruefungen/KI_in_Pruefungen/Ausfuellhilfe_Erklaerung_zur_Verwendung_generativer_KI-Systeme.pdf

Explanation of the use of generative AI systems

I have used the following artificial intelligence (AI) systems[2] in the preparation of this work:

1. Perplexity
2. ChatGPT (GPT-3.5)
3. Mindverse

I further declare that I

- ☒ have actively informed myself about the capabilities and limitations of the abovementioned AI systems
- ☒ have marked the passages taken from the abovementioned AI systems
- ☒ have checked the factual correctness of the content generated with the help of the abovementioned AI systems and adopted by me
- ☒ am aware that, as the author of this work, I am responsible for the information and statements made in it.

I have used the abovementioned AI systems as described below.

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[2] If you are unsure whether you need to list an AI system used, contact your supervisor.

Process	AI systems used	Description of use
Generation of ideas and conception of the work	1. Perplexity 2. ChatGPT	1. As search engine 2. For generating and testing initial questions, approaches, and ideas; lists created by ChatGPT served as inspiration None of ChatGPT's suggestions were adopted directly with the exception of chapter 2.3
Literature search	Perplexity	As search engine
Literature analysis	----	----
Managing of literature and citations	ChatGPT	Transformation of references in various formats into APA format
Selection of methods and models	1. ChatGPT 2. Perplexity	1. ChatGPT was asked for suitable analysis methods for a specific type of data. 2. On the basis of the answers from ChatGPT, concrete examples of application were searched for and, ultimately, I selected the methods that appeared best suited.
Collection and analysis of data	----	----
Generation of program codes	----	----
Creation of visualizations	Mindverse	Generation of alternative data visualizations and diagram variants; I created the best variants in Excel
Interpretation and validation	----	----
Structuring of the work text	ChatGPT	Generation of possible outline of the work; generation of suggestions for structuring chapters
Formulation of the work text	ChatGPT	Reformulation of paragraphs I was not happy with
Translation of the work text	ChatGPT	Translation support with English-language articles
Editing of the text	----	----

Preparation of the presentation of the text	----	----
Other supplies	----	----

Mustergart, 11 September 2023

Max Muster

Max Muster