Guidelines for the Utilization of Generative AI in Education 2024

(For Faculty Members)

October 22, 2024

Mitsuyasu Kato

Vice President and Executive Director for Education

1. Introduction

The recent rapid advancements in Generative Artificial Intelligence (Generative AI) have had a profound impact on us all, influencing not only our daily lives but also the landscape of education and research within universities. The University of Tsukuba, which was founded as a new concept university, is expected to be open to this transformative change within the academic world, adopting an open stance and approaching it with a creative and open- mindedness attitude to shape a sustainable future society. In this context, on May 11, 2023, we published the "Basic Policy on the Use of Generative AI at the University of Tsukuba" and have continued to explore this issue further. In line with our mission to cultivate talent through advanced academic pursuits, we now take the following our approach to pre-emptively engage with Generative AI as follows:

1) Utilization Based on an Understanding of Fundamental Principles

Generative AI is not a magical black box; it operates based on mathematical principles. Its possibilities, limitations, and ways to utilize it must be considered not superficially but from a foundation rooted in these principles. At the University of Tsukuba, the utilization of Generative AI, whether in education or research, is based on this foundational understanding.

2) Ethical Use for Human-Centered Empowerment

The ethical use or misuse of Generative AI depends on the ethical standards and literacy of those who engage with it. Moreover, as AI becomes further integrated into education and research, human beings will increasingly need to reflect on their role as autonomous thinkers. To ensure that AI is neither used in ways that harm humans nor fosters excessive dependency, the University of Tsukuba aims to promote the appropriate utilization of Generative AI to enhance human potential. This approach places humans, with their intrinsic dignity, at the center, enabling individualized support and optimization.

3) Endless Pursuit of Excellence Across Diverse Fields

At the University of Tsukuba, which covers a wide variety of academic disciplines compared to other universities, the utilization of AI extends broadly, covering areas such as physical activities and artistic creation. To make this multifaceted utilization meaningful for individuals and society, there is an ever-greater need for critical thinking, collaborative dialogue, empathy, and creativity. Based on education that cultivates these qualities, the University of Tsukuba will fulfill our mission by further promoting the search for truth and contributing to human society through the use of AI.

2. Basics of Generative AI

1) Principles and Precautions of Generative AI

Generative AI is a technology that uses processing systems (models) trained on vast amounts of data to generate text, images, audio, and video. Among the widely used Generative AI services are those that, when given prompts, respond in natural language. Notable examples include OpenAI's ChatGPT, Microsoft's Copilot, and Google's Gemini. At the core of such Generative AI lies a Large Language Model (LLM), which processes input by breaking it down into small units (tokens) and predicting subsequent words based on likely connections. Additionally, Generative AI generally learns from the data input by users as it is used.

This system is highly versatile and produces outputs of quality sufficient for academic work and various tasks, generating text resembling human conversation. However, any biases or inaccuracies in the original data used for training can influence the outputs produced. Thus, caution is required to avoid unintended issues such as the following:

1. Bias in information: The original training data may contain biases related to gender, race, nationality, religion, or ideology, which may result in biased output.
2. Credibility of information: If the training data includes non-factual, uncertain, or outdated information, the responses generated may also lack credibility. Generative AI does not possess factual knowledge; it is a system that operates by predicting likely word sequences, meaning that while responses may appear coherent, they could be factually incorrect.
3. Misuse of information: If training data includes copyrighted or intellectual property information, the output generated may inadvertently infringe on the rights of others.
4. Data leakage: When personal or confidential information is included in prompts, it may be incorporated into training data, leading to potential data leaks if that information is subsequently generated for other users.

2) Recommended Measures

Although various measures have been implemented by service providers, they are not yet fully comprehensive. Therefore, users are encouraged to take the following precautions:

1. Do not accept Generative AI output uncritically; always check for potential biases. Cultivate ethics and knowledge that enable you to recognize these biases.
2. Verify whether the AI's output is factual and current, not merely accurate as of the training period. Use services with fact-checking functions, and formulate prompts carefully to avoid extracting uncertain information.
3. If you suspect the AI's output may infringe copyright, do not use it. Additionally, remember that unless legally justified, the AI's output is not the user's intellectual property.
4. Follow security policies prohibiting the inclusion of personal or confidential information in prompts, and apply access controls to prevent inadvertent inclusion of such data. If using sensitive information, ensure to opt out of contributing this data to training sets or secure agreements that protect against its inclusion.

3) Use of Generative AI in Educational Settings

Each educational organization or instructor should establish policies for using Generative AI in the classroom, considering educational effects and risk management. Faculty members and students

should base their decisions to use Generative AI on these policies, ensuring it is utilized appropriately as a tool when permitted.

3. Student Life and Generative AI

The utilization of Generative AI is expected to expand beyond university classrooms, increasingly permeating students' daily lives. This chapter outlines the necessary mindset and precautions to accompany this shift. Faculty members are encouraged to provide appropriate support and engagement with students, keeping in mind the anticipated changes and potential risks that may arise in students' personal lives.

1) Preparing for Student Life in the Era of Generative AI

Generative AI is expected to significantly impact not only academic pursuits at the university but also various aspects of student life in the future. In addition to assisting with writing tasks, it may be helpful for scheduling, providing recipe suggestions, or even acting as a conversational partner. However, humans are irreplaceable beings with individual personalities, thoughts, emotions, and a physical presence. We must engage with others meaningfully, explore our inner worlds, share joys, face challenges, and cultivate our humanity. As we move toward a future where AI and humans coexist, the multifaceted strengths of humanity will be increasingly challenged. Our university life is a valuable time for nurturing these abilities—cherish each day to enhance yourself.

2) Ethical Use and Utilization of Generative AI in Student Life

The ethical use and utilization of Generative AI will become an increasingly significant consideration. To enrich and advance humans and society, it is essential not to overly rely on AI or accept its outputs unquestioningly. Beyond specialized knowledge and skills, liberal arts and literacy with breadth and depth, and a spirit of altruism aimed at coexistence and mutual prosperity are essential. These qualities should be cultivated not only within the classroom but also in daily student life.

3) Guidelines for Using Generative AI in Student Life

When using Generative AI in student life, please keep the following points in mind:

1. Proactive use: Over-relying on Generative AI for convenience and becoming a person who does not think or decide independently is counterproductive. Utilize Generative AI with proactive intentions.
2. Protection of personal information: Avoid inputting personal or private information about yourself or others into Generative AI. Such information, if inadvertently accessed by others, may be disseminated without control and may not be deletable.
3. Careful evaluation of generated information: The nature of Generative AI means that its output may contain inaccuracies or inappropriate content. Be diligent in reviewing responses and avoid making hasty judgments.
4. Avoid harming others: Even in personal settings, using Generative AI to infringe on others' rights or cause harm is unacceptable. Cultivate a commitment to the ethical use of Generative AI rather than its misuse.

5. Enhance literacy: Misinformation and fake media content generated by malicious AI use are on the rise. To avoid inadvertently contributing to the spread of falsehoods or becoming involved in criminal activities, enhance your literacy for evaluating information responsibly.

4. Use of Generative AI in Classes

The basic policy of the University of Tsukuba is to actively utilize Generative AI. Generative AI offers a wide range of potential applications, such as brainstorming through discussions and learning about its nature and limitations by crafting creative prompts. We must actively explore the potential applications of Generative AI in education, research, and administrative tasks, while understanding the associated challenges. It is essential to acquire not only practical knowledge for its use but also to remain vigilant about considerations and caution points, paying close attention to their long-term implications.

In education, particularly in course work, the appropriate use of Generative AI can. significantly enhance educational effects. Generative AI must be utilized as a tool and option in accordance with the achievement of course objectives stated in the syllabus. It is essential to continue to accumulate and systematize discipline-specific examples using Generative AI to refine the ideal form of university courses. Consequently, educational content, methods, and evaluation approaches must be regularly updated, fostering ongoing innovation in educational practices.

1) Preparation for Classes and Learning Support

Generative AI is an effective tool for supporting course design and faculty members' educational activities; enhancing the quality of education; and expanding possibilities for educational content, teaching methods, and evaluation. However, it is important for faculty members to understand the limitations of Generative AI, and the ethical and legal ramifications of its use. In other words, utilization must be based on careful planning and ethical considerations.

First, instructors must confirm the types of answers that can be generated by Generative AI for the assignments given to the students, and consider improving or revising the course design accordingly. Decisions about whether to allow the use of Generative AI should align with the achievement of course objectives. If its use risks diminishing educational effects, this should be clearly communicated to students, emphasizing the importance of the process of problem-solving over merely obtaining results. For assignments that can be completed without Generative AI, instructors should explicitly require students to do so. If Generative AI use is permitted, ensure students are not disadvantaged by differences in performance between free and paid versions. Additionally, instructors should avoid mandating the use of Generative AI, except in courses specifically designed to teach its utilization. In such cases, the purpose of using Generative AI should be clearly explained to help students understand its role and limitations as a tool.

When assigning students work that requires them to use Generative AI, instructors should inform students of the following risks:

1. Risk of leaking personal and confidential information
2. Risk of copyright infringement
3. Possibility of biased or inaccurate outputs, including harmful or offensive content

(hallucinations)
4. Discrimination and ethical concerns (prejudice and biases regarding gender, race, and religion)
5. Over-reliance on detection tools

It is also recommended that students specify the type of Generative AI used in their assignments. Furthermore, instructors should recognize the limitations of AI detection tools, which are not fully reliable and may misclassify human-written content as AI-generated. With the rapid advancements in Generative AI technologies, faculty members must stay updated on the latest developments to ensure its appropriate and effective utilization. Even as detection tools improve, they will remain imperfect, requiring ongoing vigilance and adaptation.

2) **Syllabus Descriptions**

Please refer to the section "(6) Course Requirements and Supplements" in the "University of Tsukuba: Guidelines for Creating a Syllabus" Your stance regarding the utilization of Generative AI for your course must be indicated in the "(6-2) Other (Behavioral expectations and points to note for students during coursework)" section of the syllabus. Here, it must be explained in accordance with the "(3-2) Course Objectives (Learning Outcomes)" under "(3) Course Outcome" which describes the knowledge and skills expected to be acquired through the course."

If you recommend or allow the utilization of Generative AI, the rules of its use must be clearly stated. For example, if you permit the use of Generative AI for reports, specify the required information, such as the name of the AI used, version, prompts, etc. In addition, the skills that would be enhanced or strengthened and those that might be lost by its use must be explained with reasons. The significance of the students' own thought processes, as opposed to the use of Generative AI, must also be clarified. In particular, it must be clearly stated whether Generative AI can be used in assignment preparation, along with the reasons for allowing or prohibiting its use.

3) Use in Assignments and Examinations

If the use of Generative AI is allowed or recommended for a course, it is important to re-evaluate the course content and format of the assignments and examinations. The content and volume of the assignments and examinations must be in line with the course objectives. (If you prohibit the use of Generative AI, their difficulty levels and volume must be carefully considered.) Note that examinations are highly confidential in nature; therefore, the questions must never be directly inputted into Generative AI. The specific points to be considered are as follows:

1. At the beginning or end of the class, students are presented with the assignment and have them solved the assignment in the classroom (when the use of Generative AI is prohibited).
2. Students are presented with the assignment so that they can solve it on their own (when the use of Generative AI is permitted).
3. Students must be asked to clearly state the information source, including citations, AI name, version, and prompts used (when the use of Generative AI is permitted).
4. Measures to be taken in cases of inappropriate use of Generative AI must be clearly stated.

The following are some ideas for measures to be taken if the use of Generative AI is prohibited:

1. Establishing a learning environment wherein it is physically impossible to use AI. For example, students can submit handwritten reports, take face-to-face examinations, or give oral presentations.
2. Providing assignments that are not suitable for Generative AI, such as conducting experiments, fieldwork and assignments specific to the class content.
3. Students can be made to revise or critique the text offered by Generative AI.

4) **Evaluation Method**

Clearly state whether the use of Generative AI aligns with the course objectives, and ensure that evaluations reflect this stance. The following measures can help prevent issues related to evaluations:

1. Communicate the evaluation policy in advance to avoid misunderstandings and potential issues.
2. In addition to assignments that are easy to assume the utilization of Generative AI to generate reports, etc., combine evaluation methods that might involve Generative AI with other methods, such as examinations or group activities.
3. Establish evaluation criteria that do not directly link the performance of Generative AI (e.g., the difference between paid and free versions) to grades, ensuring fairness.
4. Do not rely excessively on plagiarism detection tools or software.
5. When the utilization of Generative AI is prohibited and there is suspicion of its use, provide students with an opportunity to explain before making a final judgment.
6. Clearly state the course policy regarding the utilization of Generative AI.

5. Guidance for Academic Writing and Research Supervision

It is essential for faculty members to support students in using Generative AI appropriately and effectively, while also providing guidance to maintain academic integrity and originality in their work.

1) The Role of Generative AI and Ethical Use

Generative AI is a powerful tool for supporting students' learning and research, but the generated content itself is not the end goal of their studies. Faculty members should guide students to view Generative AI as a supplementary tool that enhances their own knowledge and thinking abilities. For example, when students use AI to draft research papers, they should be encouraged to interpret the information from their perspective and rephrase it in their own words while utilizing that information. Academic integrity and ethics are also crucial when using Generative AI. Students should be instructed to clearly cite any AI-generated content used and to avoid using others' research or work without permission. This approach prevents academic misconduct and copyright infringement, promoting a commitment to honest research.

2) Verification of AI-Generated Content and Data Security

Generative AI can produce a vast amount of information, but it is not always accurate. Particularly with academic content, there may be questions about the precision and reliability of AI-generated information. Faculty members should guide students not to take AI-generated content at face value but to verify it against reliable academic sources and perform fact-checking. This helps prevent research and paper-writing based on inaccurate information. Additionally, when using Generative

AI, we must be mindful of data privacy and security, especially regarding the information they input. Carelessly inputting research data or personal information into AI could lead to unintentional data leaks. Faculty members should clearly explain which types of information should or should not be input into AI systems, fostering students' awareness and caution in handling data.

3) Establishing and Communicating Guidelines

Faculty members should establish clear guidelines on the use of Generative AI and communicate these to students. These guidelines should include specific instructions on using AI ethically, such as how to properly cite AI-generated information, the permitted scope of AI use, and rules for maintaining originality. These guidelines serve as a behavioral standard for students using AI, helping them to conduct research with academic integrity and ethical consideration. When guiding students based on these guidelines, faculty members should emphasize that AI is merely a supportive tool and that the core goal is for students to take an active role in their learning. In addition, it is important to provide examples and appropriate ways to utilize AI so that students can utilize it effectively while cautioning against excessive dependency on AI.

6. Appendix

These guidelines are based on the conditions as of October 22, 2024. It will be reviewed regularly to incorporate the latest information and appropriate measures, so please check for updates periodically.

This document is a translation of the original Japanese version. In case of any discrepancies or ambiguities, the Japanese version shall prevail as the official document.