Responsible use of Generative AI in Research V1.0

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INTRODUCTION

Generative AI refers to tools and techniques that can create text, images, audio, or video by learning patterns from large amounts of data. Although methods vary, for text Generative AI works by predicting what is most likely to come next in a sequence, based on what they have learned during training and based on mathematical models derived from machine learning. When a prompt is provided, new content is generated by combining patterns in the system rather than by simple copying of existing material

Generative AI has many applications within research - it can help with drafting text, summarizing information, creating visualizations, and even exploring ideas. However, it is crucial to understand and recognise that there is no real thought process or guarantee of accuracy and that outputs are based on probabilities. This can lead to biased results, factual inaccuracies and/or misleading information. These are all things that researchers actively seek to avoid, so there is a need to be vigilant in the use of Generative AI in research.

These guidelines set out the current perspective of the University on the responsible use of Generative AI in a research context. There are two elements to this document:

- Principles for the use of Generative AI
- Examples of use cases for Generative AI in research (not an exhaustive list).

SCOPE

These guidelines cover the use of generative AI systems in research activities, e.g. postgraduate studies, staff research projects. The use of such systems in the context of teaching, learning, feedback and assessment of approved taught modules is described in the Guidelines on the Responsible use of Generative Artificial Intelligence in Teaching, Learning, Feedback and Assessment in TU Dublin[1] which includes an AI Assessment scale that is not appropriate for research activities.

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[1] See: https://www.tudublin.ie/media/website/explore/about-the-university/academic-affairs/quality-framework/documents/Guidelines-on-the-Responsible-Use-of-Generative-Artificial-Intelligence-in-Teaching-and-Learning-13.5.25.docx

PRINCIPLES FOR USE OF GENERATIVE AI

Principle 1

Use of generative AI systems/tools must follow applicable institutional, national[2], EU[3] and international laws, regulations and data protection standards. This includes:

– Ensuring that the research activity has met relevant University requirements in relation to ethical review, data protection etc.

– Meeting obligations under data protection in the event of encountering a data breach during the use of generative AI.

– Ensuring that the use of generative AI is aligned with the Research Integrity standards[4]

Principle 2

Users should familiarise themselves with the capabilities and limitations of any Generative AI system/tool they propose to use, including changes that may emerge as part of new product iterations, particularly those that may impact data privacy and copyright.

Principle 3

The user of generative AI systems/tools is wholly responsible for ensuring the veracity, accuracy and/or creative merit of the output generated by the model, and for assessing the potential for falsification, fabrication and plagiarism due to the use of the system[5].

Principle 4

For funded research, the use of generative artificial intelligence systems/models should be in accordance with the terms and conditions of the funding.

Principle 5

Generative artificial intelligence systems may not be used to replace the complete research process via pervasive automation of all steps in the process[6], i.e. the human must remain at the centre of the process of research, innovation or scholarship.

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[2] See: https://www.gov.ie/en/department-of-public-expenditure-infrastructure-public-service-reform-and-digitalisation/publications/guidelines-for-the-responsible-use-of-ai-in-the-public-service/

[3] See: https://european-research-area.ec.europa.eu/news/living-guidelines-responsible-use-generative-ai-research-published

[4] See: https://www.iua.ie/wp-content/uploads/2024/12/National-Policy-Statement-on-Ensuring-Research-Integrity-in-Ireland-Dec-2024.pdf

[5] Users are expected, as part of responsible conduct of research, to have sufficient competence to assess these aspects, including potential bias inherent to the system/model used.

[6] Pervasive automation refers to the idea that all the steps in the research process, from conceptualisation to data generation and analysis are carried out by a generative AI system.

Principle 6

In line with the University's Authorship and Publication policy, artificial intelligence systems and/or generative models cannot be included as co-authors on any research, innovation or scholarly output.

Principle 7

To support transparency, if generative AI systems/tools are used, details of that use should be stated and, where appropriate, cited.

- From the perspective of how this is included in the output, this should be considered equivalent to other method-related details such as systematic search strategies, statistical and data analysis, image processing etc. This includes the use of any system that amends text beyond simple spelling and grammar checks.
- Where specific prompts or other initial/seed inputs are used, these should be described in the output (e.g. via appendices, supplementary material), noting the conventions and practices with a given discipline and route of dissemination, and requirements of publishers or exhibitors. In all cases the researcher should retain the prompts used as part of the research record.
- Where novel conversational assistants are created by a researcher, to either support research or as an element of research in-and-of themselves, the details of how this was constructed and used to create reportable research data should be included.

Principle 8

While a broad range of systems and tools are available, only the following should be used in the context of research activities where the information is sensitive, confidential or where there are/may be intellectual property issues, including during peer review practices:

- Systems which by default do not retain data or which permit user to disable data retention.
- Systems where the data is created and saved on closed/bespoke University hardware platforms as part of Generative AI research and development (e.g. a locally hosted LLM).

In all cases, the user should consider the requirement to safeguard original research work and creative outputs.

SPECIFIC USE CASES

TU Dublin recognises the following as broad areas where there may be legitimate uses for generative artificial intelligence systems/models in the context of research, innovation and scholarship[7]:

- Engagement with the academic literature (e.g. identification of sources, summarising and making connections between them using tools such as Elicit, or tools designed to support systematic reviews such as ASReview)

- Proofreading of written material to correct format, organisation, grammar, spelling and punctuation errors (e.g. Grammarly, QuillBot AI), and ensuring alignment with publisher guidelines.

- Scoping and/or outlining the content of e.g. a research paper, book chapter, funding submission.

- Facilitating personal learning, brainstorming, idea and concept exploration via a dialogue with the tool, in the manner of a research advisor, research buddy, research assistant or critical friend (e.g. Notebook LM).

- Identification of appropriate/relevant experimental design elements such as sample size evaluation, methods to answer specific research questions and identification of appropriate statistical approaches.

- To support creative workflows to produce artistic, design, and musical works, including in the use of generative artworks via an approach based on critical dialogue with the artist.

- To support data analysis workflows – particularly in relation to analysis of large datasets - including wrangling/cleaning data, generation of transcripts, performing calculations and running scripts, noting the responsibilities of the researcher described above.

- To support code generation and/or debugging as part of application development and/or data analysis workflows.

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[7] Note that this is not a comprehensive list and is derived from the general principles noted in points 1-8, with specific practical examples given as a guide for researchers. This will be regularly reviewed to ensure that relevant legitimate uses required by the University are included. Please contact researchethics@tudublin.ie for advice if an activity is not included here.