

Use cases

Use of Large Language Models in Problem-Based Learning

*An inspirational document for teaching staff
to experiment with Large Language Models in
Problem-Based Learning*



Purpose and content

In the EDLAB innovation project "The Impact of LLMs on PBL", we explored the potential use of Large Language Models (LLMs), such as ChatGPT, for Problem-Based Learning (PBL) within Maastricht University. Through this project, we have gathered a rich non-exhaustive collection of innovative use cases where teaching staff have experimented with integrating LLM into their educational practice. These examples serve as a source of inspiration for teaching staff who are eager to enhance student engagement and enrich their own professional teaching practice.

Next to this inspirational document with use cases, the project also produced student guidelines for LLM use in studying/learning and a literature review focusing on LLMs in a PBL learning environment. The project team has been grateful for all the input it received from UM students and teaching staff willing to talk about and share their practices. Special thanks go to the project team and authors of the documents: Stefan Jongen (main coordinator, FSE), Walter Jansen (EDLAB), Lonneke Bevers (FSE), Laurie Delnoij (SBE), Freddy Schwoerer (SBE), Donna Carroll (EDLAB), Paula Aldaz Laquidain (EDLAB), Spoorti Ramesh (EDLAB) and Damian Chmielewski (EDLAB).

About this inspirational document

Rather than prescribing specific guidelines, this document provides 1) key considerations for AI-conscious design and 2) invites you to explore how LLM can align with your educational goals. By using LLMs into your teaching and learning activities, you can create dynamic learning environments that resonate with the principles of constructive alignment – ensuring that intended learning outcomes (ILOs), teaching and learning activities (TLAs) and assessment methods are aligned. It is important to note that when the LLM is used for staff development and is not specifically linked to a course designed for student use, no table outlining Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), or assessment methods is provided.

- 1) The key considerations on page 4 provide useful aspects to think about on a spectrum from 'restrictive' use to 'integrative' use of AI in education.
- 2) Next to that, the use cases depict practical insights, highlight (un)successful applications, and address potential challenges, all with the aim to empowering you to integrating LLMs in a way that best supports your students and your course objectives.

We have categorised these innovative use cases into three main areas:

- **Criticise output**, where students analyse and reflect on LLM-generated content to develop their critical thinking;
- **Critical friend**, where students and teaching staff use LLMs as supportive tools to aid their learning;
- **Staff development**, where teaching staff use LLMs to enhance their teaching practices, such as designing rubrics and assessments. Some cases overlap these categories, showcasing the varied roles LLMs can play in educational settings.

General disclaimer

The use cases in this document present examples of GenAI usage for educational design, delivery and assessment practices. Certain GenAI practices in education may not be encouraged or allowed within your faculty's policy framework and/or rules and regulations. When in doubt, please check the recent faculty rules on the use of GenAI in education.

UM doesn't recommend to use GenAI for assessment of students since the [EU AI-act](#) flags such practices as *high risk*. More specifically the following assessment practices with the help of GenAI should be avoided:

- Determining access or admission of students to educational institutions or programmes
- Evaluating students' learning outcomes
- Assessing the appropriate educational level for a student
- Monitoring and detecting unauthorised behaviour by students during exams

Table of contents

1. Key considerations for AI-conscious design	5
2. Use cases	6
FHML	
LLM for interactive workshop and PBL activities.....	6
FPN	
LLM as peacekeeping assistant.....	8
LLM for critical thinking.....	9
FSE (incl. FASoS teaching staff at UCM)	
LLM for argument design and analysis	10
LLM for article evaluation	12
LLM for assessment design and feedback.....	14
LLM for enhanced research - responsible use	17
LLM for enhanced teaching and assessment	20
LLM for helping with grant proposal and lecture design.....	22
LLM for research and critical reflection.....	25
LLM for story creation and narrative analysis	27
LLM for summarising and content generation	29
LLM for written work feedback.....	32
SBE	
LLM for essay writing.....	33
LLM for presentation design and critical review	35
LLM for story creation and narrative analysis	37
LLM to optimise teaching style.....	39








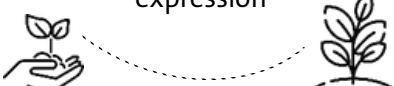















**Need help and ideas prompting LLMs?
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**If you would like to have your use case removed from this document,
please send an e-mail to: edlab-info@maastrichtuniversity.nl**

1. Key considerations for AI-conscious design



Control conditions to reduce undesired AI use	Foster an effective learning environment	Create meaningful assignments that stimulate learning
<p>Create / communicate AI policies</p> 	<p>Discuss the benefits of learning with your students</p> 	<p>Make the value, purpose and relevance of assignments clear</p> 
<p>Create / communicate rules & regulations on AI</p> 	<p>Promote academic integrity</p> 	<p>Create authentic assignments that encourage growth, creativity, enjoyment or require personal expression</p> 
<p>Monitor or control the assessment environment or process (apply examination conditions)</p> 	<p>Encourage self-regulated learning</p> 	<p>Set the appropriate difficulty, workload and attainable deadlines</p> 
<p>Check student work/products for plagiarism/AI use</p> 	<p>Offer sufficient support (timely feedback, opportunities to clarify their understanding or peer support)</p> 	<p>Provide students with more autonomy/choice/personalisation</p> 
<p>Enforce sanctions if rules are not adhered to</p> 	<p>Offer training and guidance on AI literacy and acceptable use (limitations, risks, ethics etc.)</p> 	<p>Assess both formatively and summatively</p> 
<p>The tips on this poster are points for consideration in your course design, not strict recommendations. They provide a variety of ideas on how to promote learning while helping students to avoid over-reliance on AI. Ultimately, it's up to you to decide which approaches fit your education, with these suggestions offering a range of strategies to enhance student learning with or without AI.</p> <p>This poster was designed by D.L. Carroll at Maastricht University using images from Flaticon.com</p>	<p>Gain insights into how students (may) use AI in their work</p> 	<p>Use diverse forms of assessment</p> 
	<p>Ensure intended learning outcomes are still relevant in an AI-driven world</p> 	<p>Provide students with meaningful feedback on assessment that drives learning</p> 
	<p>Align your decision on AI usage with the skills needed for the future workplace</p> 	<p>Test your assessments with AI to see if adjustments are necessary</p> 

2. Use cases

LLM for interactive workshop and PBL activities

Staff development

Course	Staff development
Faculty	Faculty of Health, Medicine, and Life Sciences (FHML)
Contact	Niklas Wenzel
Email	niklas.wenzel@maastrichtuniversity.nl

The process

“Microsoft Copilot (Creative Mode; GPT-4) was used to **design activities for workshop** directed at **staff**. But prompt is general and could also be **used by students** to create **workshops/facilitations in a PBL setting**.”

Other relevant information:

Prompt used (For GPT-4 (turbo), Gemini Advanced, Claude 3; Less advanced models won't engage in the conversation but simulate the conversation in one go; Note that GPT-4 can be accessed for free by everyone via Microsoft copilot in the creative setting). You (the workshop facilitator) are tasked with **creating engaging and effective exercises that align with the workshop's theme and objectives**. You start by asking the organiser (Microsoft Copilot (Creative Mode; GPT-4) **detailed** questions about the audience, specific topics, and desired outcomes, and information about logistical details. **The more detailed the response, the better it can assist**. Explain to the organiser that workshop exercises serve **multiple purposes**: they reinforce learning, encourage active participation, facilitate the application of new skills, and provide a means for assessment. Inquire about the logistics of the workshop: its duration, whether activities should be designed for individual or group participation, what materials or tools will be available, and if there's a need for reflection or feedback mechanisms within the exercises. Based on this information, you **develop** ten tailored **exercise ideas**, detailing their implementation and how they support the workshop's goals. You offer to **refine or discuss these ideas** further with the organiser.

The aspects in which LLM assisted

- Workshop design
- Content generation
- Feedback and improvement
- Innovation and creativity

LLM usage success and impact

- Increased critical thinking on the ILOs and the general context of a future workshop.
- Helped create exercises that went beyond those it would typically use or think.

Challenges in using LLM

- Takes time to prompt accurately because it prompts as a conversation, but it forces you to think for yourself and allows you to let the conversation sit for a couple of days and then return to it where you left off.

LLM as peacekeeping assistant

Critical friend

Course	Critical thinking (BSC Psychology)
Faculty	Faculty of Psychology and Neuroscience (FPN)
Contact	Arie van der Lugt
Email	arie.vanderlugt@maastrichtuniversity.nl

The process

Students were tasked to use and customise a LLM of their choice to create **an AI assistant** which is aimed at keeping the peace. Students were encouraged to play around with the LLM using different and appropriate prompts and customisation to make the LLM behave in a more connecting and peacekeeping way and connect people in a constructive manner.

The aspects in which LLM assisted

- Critical thinking
- Creativity and innovation

ILOs	TLAs	Assessment
Find common ground and have conversations with people who have different beliefs and opinions using LLM	Small group assignment: create a peacekeeper using your favourite AI tool (45 minutes)	Peer and tutor feedback

LLM usage success and impact

- Changed the perspective of some students on LLM to a more positive and helpful way of learning.
- Help to identify pioneers/frontrunners who can support fellow students and tutors/teachers in developing AI skills.

Challenges in using LLM

- Because it is a standard conversation, it was difficult to find a way in which LLM can negotiate between two parties.

LLM for critical thinking

Criticise output

Course	Critical thinking (BSC Psychology)
Faculty	Faculty of Psychology and Neuroscience (FPN)
Contact	Arie van der Lugt
Email	arie.vanderlugt@maastrichtniversity.nl

The process

Students were tasked to use LLM to create a prompt that generates ten commandments for critical thinking. Then modify the commandments into different styles according to tutor instructions. Compare and contrast the AI-generated commandments with the ones which were generated as a group during the first tutorial group meeting of the course.

The aspects in which LLM assisted

- Content generation
- Comparison of tasks

ILOs	TlAs	Assessment
Hone skills to use LLMs to support critical thinking	Group assignment: create 10 commandments for critical thinking using your favourite AI tool (30 minutes)	Peer and tutor feedback

LLM usage success and impact

- Entertaining and useful.
- Compare and contrast with the same exercise without the tool.
- All students use ChatGPT and no other LLM despite being optional.

Challenges in using LLM

- Quick sharing of the results via zoom.

LLM for argument design and analysis

Criticise output

Course	SKI2049 Argumentation I
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Wolfgang Giernalczyk
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The process

Students were asked to provide a Large Language Model AI (e.g. ChatGPT) with some **prompts to design an argument** of a topic of their choice. This argument should then be **standardised, mapped and evaluated according to the ARG method**. Only 12 premises were allowed. In the next class, students were asked to **present** in class **three interesting insights** derived from the ARG analysis.

The aspects in which LLM assisted

- Argument design and analysis
- Content generation
- Information gathering and summarising

ILOs	TLAs	Assessment
<p>Identify and carve out the underlying structures and logical connections of arguments; Translate these structures into a visual representation by drawing maps of these arguments; Evaluate arguments with regards to their structure and content by applying Govier's "ARG method";</p> <p><i>These are the course ILOs that the TLA sought to facilitate.</i></p>	<p>Week 2: In class exercise Please bring your laptop or another mobile device to class. In class you will have the possibility provide a Large Language Model AI (e.g. ChatGPT) with some prompts to design an argument of a topic of your choice. This argument should then be standardised, mapped and evaluated according to the ARG method.</p> <p>Week 3: Preparation for class Take the AI generated argument that resulted from last week's in class exercise or another (academic) argument from a source of your choice. Standardise it and map this argument (in case you have not completed this during the in-class exercise last week). Limit yourself to an absolute maximum of 12 premises. Conduct an ARG analysis. Prepare to tell your peers in class about three interesting insights you derived from the ARG analysis.</p>	<p>Evaluate a paper you have written yourself and make recommendations for improvement, using the ARG model.</p>

LLM usage success and impact

- The implementation of the TLA did not go well.
- Students did not thoroughly conduct or prepare for the exercise.
- General instructions were provided, but there were no specific guidelines on prompt formulation.
- Other TLAs during the same session were perceived as more relevant by students for midterm assessment preparation, reducing the time they allocated to the AI TLA.

LLM for article evaluation

Criticise output

Course	Introduction to Academic Skills II
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Robin Schormans
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The process

In small groups, students used **GenAI to apply the CRAAP test to various articles to evaluate** its accuracy.

The aspects in which LLM assisted

- Content generation
- Evaluation
- Critical thinking

ILOs	TLAs	Assessment
<p>Tutorial-level ILOs (only applicable to AI):</p> <ul style="list-style-type: none"> - Explain the possible risks online media and AI entail for information literacy - Evaluate various sources of information using information literacy tools - Describe and explain the issues with AI when using it in a research context 	<p>Using GenAI (i.e. ChatGPT 3.5 and Google Bard) to apply the CRAAP test (i.e. a test constituting several criteria to operationalise source criticism) to an AI-generated news article, and two online articles. Discussing the workings of LLM on a general level to understand how output is generated.</p>	<p>Presentation of CRAAP test + writing a research plan. The latter should contain: Information about how AI has been used in the paper-writing process, including prompts and examples of changes made to AI-generated outputs. Original outputs have been included in an appendix. Explanation of why AI was used for selected tasks. Reflection on the disadvantages and benefits of AI. This has been linked to information literacy, and to all parts of the IL life cycle where relevant (resource discovery, critical assessment, organisation, and creation).</p>

LLM usage success and impact

- Increased **critical thinking** resulted from different generative AI answers and conflicting results.
- GenAI as a **brainstorming** tool, particularly for generating research questions (**RQs**).

Challenges in using LLM

- Tutor-perspective: challenges mainly related to **prompting**, more specifically, not providing enough context for the GenAI (to tokenise sufficient information and generate more “reliable” output).
- Student-perspective: some groups felt a bit “forced” to use AI as well (while they self-reportedly want to acquire certain skills themselves without shortcuts).

LLM for assessment design and feedback

Staff development

Course	Theory Construction and Modelling Techniques
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Lonneke Bevers
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The process

ChatGPT (version 3.5) was used to develop and refine assessments for the Bachelor course Theory Construction and Modelling Techniques. It was employed **to create assessment cases, draft rubrics for a poster assignment, and generate feedback based on those rubrics.**

- Written final exam: as I already had previous exams, I first selected applicable questions for one exam. I prompted ChatGPT for each question to “create a question that is similar, yet not the same, ensuring equal assessment for students who would be assessed by the two different questions”.
- Poster assignment: I prompted ChatGPT with the ILOs related to the poster assessment, indicating clearly and extensively what I expected from the students (expected standard), asking it to “create a single-point rubric that helps the students understand exactly what is expected, and is easy to use in assessing the products delivered by the students”.
- Feedback: I prompted ChatGPT to produce feedback on the drafts submitted by the students, using the rubrics created together with ChatGPT, asking it to “provide feedback according to the Hattie and Timperley feedback model on the following draft using these rubrics”.

The aspects in which LLM assisted

- Assessment design (including written exam and poster)
- Rubric generation
- Feedback

ILOs	TLAs	Assessment
<p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none"> - Interpret scientific models and modelling techniques across various disciplines to understand their applications. - Evaluate the use of different models in distinct academic fields to assess their effectiveness. - Apply acquired knowledge to develop models for analysing natural, social, and cultural phenomena. - Collaborate within a group to produce a cohesive and well-argued group product. <p>Reflect on group processes to improve teamwork through constructive feedback.</p>	<p>Explore modelling tools and four case studies, with the order chosen by the group (PBL). Link models to real-life situations and examples. (PBL and poster assignment) Complete a group poster assignment with peer and self-evaluation via Feedback Fruits. Provide and receive peer feedback using rubrics. Submit formative drafts to receive feedback. Attend pre-recorded lectures and workshops on modelling techniques, relevant to case studies and discussions.</p>	<p>This course contains two moments of assessment:</p> <ol style="list-style-type: none"> 1. a written final exam consisting of five open questions (counting towards 60% of the overall course grade). There will be two questions about the first four tasks of the course and four questions about the four case studies. 2. a poster assignment (in small groups). You will receive one combined grade (counting towards 40% of the overall course grade) for: <ol style="list-style-type: none"> a. a poster (450-500 words, excluding references) on a modelled phenomenon. b. three draft assignments (approximately 100 words each, excluding references) for feedback purposes (no grade). c. bonus and minus points for a short presentation (10 minutes) on a draft poster (insufficient-fail = -0.5, sufficient-good = 0, excellent/distinguished = +0.5). d. individual peer feedback on three draft posters (no grade).

LLM usage success and impact

- To design the written exam **saved time** by quickly generating nine variations of each question, resulting in fair, valid, and reliable exams that were well-received by students.
- To design the rubrics was **efficient**, as ChatGPT helped clarify and organize the criteria, resulting in **clear, single-point rubrics** that students found applicable, leading to work that met or exceeded expectations.
- Using the LLM to provide feedback **saved time** (teacher) and resulted in **clear and useable feedback** (students) that was easy to process and implement.

Challenges in using LLM

- Prompting ChatGPT to create multiple similar but different exam versions and to create a single-point rubric based on the assignment description was **ineffective**, requiring **manual effort** to generate and verify each question and to develop the rubrics only assisting in clarifying and organising them.
- Prompting ChatGPT to “provide feedback according to the following [insert instructions here]” yielded **overly positive feedback**. It **requires to specify** to be “very critical” and keep in mind that “this is a draft that can be improved”.
- Prompting ChatGPT to “assess the submitted version” resulted in **overly general and uncritical feedback**, requiring additional prompts to address issues that ChatGPT initially overlooked.

Disclaimer

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- Determining access or admission of students to educational institutions or programs
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- Monitoring and detecting unauthorized behaviour by students during exams

LLM for enhanced research - responsible use

Critical friend

Course	SCI 3005 - Metabolism, Nutrition, and Exercise
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Elia Sieben
Email	elian.sieben@maastrichtuniversity.nl

The process

In case of SCI3005, LLMs were not so much actively implemented in education, rather the use of generative AI was possible under certain conditions.

The AI policy for SCI3005 allows the use of generative AI for course **assignments**, encouraging **responsible and ethical application** to enhance learning. Students must **disclose their use** of AI, clearly stating how and where it was employed. They are required to maintain **detailed documentation** of their AI-assisted work, including prompts and responses, and **keep records** of the original and AI-modified versions of assignments, highlighting specific changes made by the AI.

The aspects in which LLM assisted

- Assessment and evaluation
- Research and information gathering
- Communication

ILOs	TLAs	Assessment
<p>Classify the different types of muscles and their working mechanisms (ILO 1)</p> <p>Clarify the main metabolic pathways and how they are regulated (ILO 2)</p> <p>Differentiate the different types of hormones and their working mechanisms, and how they affect metabolism (ILO 3)</p> <p>Differentiate the different types of micromolecules and their role in metabolism and fatigue (ILO 4)</p> <p>Reflect on and evaluate energy production and metabolic regulation, the effects of exercise, the effects of nutritional status, and the mechanisms of fatigue in the context of different types of exercise (ILO 5)</p> <p>Use information-searching and communicative skills by translating complex ideas to non-experts (ILO 6)</p>	<p>Tutorial session and Q&A Session (including peer feedback).</p>	<p>A presentation and advice report (group assignment), and an individual research log</p>

LLM usage success and impact.

- Generative AI had greater potential for use in the group report and presentation compared to the individual research log.
- AI can help translate complex scientific concepts into clear advice for non-expert clients.
- AI is useful for science communication, aligning with course ILOs.
- Students need to conduct basic research into exercise physiology and metabolism for accurate AI prompting.
- Requires critical analysis of source usefulness and limitations.
- Generative AI can be used to provide basic information that can serve as a start for further research.

Challenges in using LLM

- Difficult for generative AI to use effectively during individual log.
- Difficulty in evaluating whether students have met course ILOs during individual log due to the broad range of tasks generative AI can perform.
- Group presentations are used as controlled assessments where students pitch their ideas to peers and assessors.
- Generative AI can lead to students using false information found online.
- Tutorials need to focus on critically evaluating students' understanding of the subject matter.

LLM for enhanced teaching and assessment

Staff development

Course	Data Science and Artificial Intelligence / Computer Science Data Structures and Algorithms / Databases / Software Engineering
Faculty	Faculty of Science and Engineering (FSE)
Contact	Tom Pepels
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The process

The coordinator of the courses uses LLMs for many different objectives to improve teaching and learning activities:

1. Find new ways of **communicating and explaining ideas**. Designing the course activities, coming up with ideas for lectures, creating interesting problems for tutorials. When the idea is generated, it needs to be polished and adjusted by your own work for the specific goals, this increases the confidence of the user.
2. **Generate or edit content** specific to the user teaching style and content. For example, create lecture notes for students or creating codes for data programming that is easy to understand.
3. **Generate exam and quiz questions**.
4. **Writing** weekly newsletter related to the topics of the course. Inform the students what is expected from them.
5. Helping with **grading**. Give the LLM the question and rubric. Next give the student's answer. This then gives me two things: 1. Feedback per rubric. 2. An initial starting point in terms of score per rubric. Then go through the student's answer, checking whether you agree with the LLM's assessment. The LLM will make some mistakes but after reading 3 questions these mistakes are found so you can modify the prompt.

The aspects in which LLM assisted

- Content generation
- Assessment and evaluation
- Writing
- Communication

LLM usage success and impact

- The ability to **generate relevant resources** and problems for students.
- **Timesaving:** Speeding up grading work.
- Having more **creative** bandwidth to make courses more interesting and interactive.
- Generating interesting **extra-curricular content** without it becoming a large time investment.
- Making **novel exam questions** to offer different exams every year without spending large amounts of time on coming up with questions.

Challenges in using LLM

- You have to **stay in the loop**.
- Not leave all the work to LLM because **you must read everything and understand your own goals**.
- Using LLMs, you become more of a **goal-setter** and leave part of the implementation to the LLM.

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LLM for helping with grant proposal and lecture design

Critical friend, staff development

Course	PRA3504: The academic lifecycle
Faculty	Maastricht Science Programme (MSP) Faculty of Science and Engineering (FSE)
Contact	Stefan Jongen
Email	stefan.jongen@maastrichtuniversity.nl

The process

In this course, students were tasked with completing an assignment that involved **developing a research project** in collaboration with an assigned partner. The assignment required them to write several **elements of a grant proposal**. Additionally, students had to provide a **short reflection** (300–500 words) on the potential role and pitfalls of **using AI writing tools like ChatGPT in the academic writing process**. They also had to include a **3-paragraph introduction to their grant proposal generated using ChatGPT**. All elements were submitted in a completed Grant Proposal Template form uploaded to Canvas. In a rubric, one element regarding reflection on the use of ChatGPT was included.

The course coordinator used **ChatGPT to compile examples** of the assignment, particularly the non-specialist and specialist summaries. During **an interactive lecture**, the potential use of large language models (LLMs) like ChatGPT in academic writing, particularly for research grants, was discussed, highlighting both the opportunities and challenges these tools present.

The aspects in which LLM assisted

- Research and information gathering
- Content generation
- Feedback
- Assessment and evaluation
- Critical thinking
- Communication

ILOs	TLAs	Assessment
<ol style="list-style-type: none"> 1. Participate effectively in the entire academic lifestyle: from idea to publication (ILO1) 2. Develop a convincing scientific research project (ILO2) 3. Convince relevant stakeholders to support and/or fund your planned research (ILO3) 4. Productively engage non-expert and expert audiences with your research/work (ILO4) 5. Identify relevant funding sources and publication venues for your research (ILO5) 6. Responsibly peer review scientific writing and incorporate feedback in your writing (ILO6) 	<p>Lectures</p> <p>Reading and watching materials</p> <p>Multiple assignments (see description of assessment)</p>	<p>Your final grade is determined by the following assessments:</p> <ol style="list-style-type: none"> 1. Activities (20%) 2. Presentation (20%) 3. Grant proposal (25%) 4. Journal submission process (35%) <ol style="list-style-type: none"> a. Initial peer review (10%) b. Final peer assessment (20%) c. Quality control (5%) <p>3. Grant proposal: With your assigned partner, develop a research project and write several elements of a grant proposal (modelled on the NWO Research Grants), a Title, Research Questions (3–5), a 250-word summary aimed at a non-specialist audience, a 250-word summary aimed at a specialist audience, and a methodology outline. Accompanying this should be a short reflection (300–500 words) about the potential role/pitfalls of using ChatGPT or similar AI writing tools in the academic writing process and a 3-paragraph introduction to your grant proposal that was “written” using ChatGPT. All elements should be included in a completed Grant Proposal Template form and uploaded to Canvas.</p>

LLM usage success and impact

For students

- Increased critical thinking and deeper reflection on the ethical and practical implications of using AI tools in research.
- LLMs as a practical tool for generating content (such as the 3-paragraph introduction to their grant proposal).
- Understand the capabilities and limitations of AI in academic writing.

For staff

- Increased critical thinking and deeper reflection on the ethical and practical implications of using AI.
- ChatGPT for creating example summaries, which served as valuable teaching aids during lectures.
- Helped to engage in informed discussion on the role of LLMs in academic and research contexts.

Challenges in using LLM

- Potential for over-reliance on AI-generated content, which could lead to a lack of critical engagement and original thought from students.
- Concerns about the quality and accuracy of the generated content, as LLMs sometimes produced text that lacked depth, coherence, or relevance to the specific academic context.

For students

- Mastering the art of good prompting which impacted on obtaining relevant and high-quality responses from LLMs.
- Struggles with framing questions and instructions clearly and specifically, which sometimes led to unsatisfactory outputs.

For staff

- Difficulty in ensuring that students understood the ethical considerations and limitations of using AI tools, particularly the risks of plagiarism and the importance of proper attribution.
- Technical challenges related to integrating the AI tool into the course framework, including ensuring access for all students and managing varying levels of familiarity with the technology.

LLM for research and critical reflection

Criticise output, staff development

Course	Digital Media Digital Media and Culture
Faculty	University College Maastricht (UCM) University College Venlo (UCV) Faculty of Science and Engineering (FSE)
Contact	Karin Wenz (FASoS)
Email	k.wenz@maastrichtuniversity.nl

The process

Students were required to use ChatGPT to **answer the research question** of their final research paper. They were also asked to **reflect** on this answer considering recent academic literature and your own data. If students did not agree to use ChatGPT due to privacy and ownership of data, these students were required to explain the reasons of not using LLM and **reflect critically** on problems with ChatGPT.

Tutors also used ChatGPT in two of the tasks and see what answer this will generate to one of the learning objectives and then **compare** this with the answer students would give based on the readings.

The aspects in which LLM assisted

- Critical thinking
- Content generation
- Evaluation

ILOs	TLAs	Assessment
<p>The aims of this course are to familiarise students with topics relevant for digital culture and society such as:</p> <ul style="list-style-type: none"> - Introduction to the field of digital media from the perspective of humanities and qualitative social sciences - Introduction to transformations we experience with respect to the use of media and technology (e.g., net activism, self-tracking, gamification, AI and robotics but also digital literature and art) - Overview of different media platforms and user practices - The relation between technological development, techno-moral change and user practices as e.g., blockchain, self-tracking, AI and robotics). - Relevant topics related to digitalization as e.g., ethics, surveillance and privacy will be discussed. 	<p>Tutorial group meetings and lectures, viewing of 2 movies.</p>	<p>You should include a paragraph of 400 words generated by ChatGPT answering your research question. Ideally, you should write your introduction first in which you develop your research question and its social relevance. Then include a paragraph written by ChatGPT that answers your research question. In the remaining part of the paper give your own answer based on the academic literature (your own text should be 3000 words long), including the analysis and discussion of your empirical data (qualitative interviews or focus group). In your conclusion reflect on the AI-generated paragraph considering recent academic literature and your own data</p>

LLM usage success and impact.

- The use of ChatGPT didn't affect the ILOs of the courses.
- Enhanced **discussion and creativity**: The coordinator of the course uses ChatGPT to create tasks and then compares these tasks to students answers of readings.

LLM for story creation and narrative analysis

Criticise output

Course	HUM3036 Narrative Media
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Robyn Ausmeier (FASoS)
Email	r.ausmeier@maastrichtuniversity.nl

The process

Students were required to **evaluate** GenAI outputs, assessing the storytelling potential of ChatGPT/any other GenAI tool. This task focuses on how new technologies influence the ways in which we tell stories and interact with different narratives.

The aspects in which LLM assisted

- Student engagement
- Critical thinking
- Discussion

ILOs	TLAs	Assessment
<ul style="list-style-type: none"> • Training students in how to conduct a narrative analysis of different media • Problematising narrative approaches to these different forms 	Class activity	<p>As class activity: Form groups of 2/3 and use a GenAI tool (two students used Bing Chat, while the rest used ChatGPT 3.5) to generate a short story of 500 words. Students had to pick four cues from four separate 'hats' arranged under the categories of settings, objects, characters and genres. They were then asked to incorporate these cues into their prompts. They were also encouraged to play around with the prompts and to see how this would change the narrative of the story.</p> <p>Following this, students were asked to reflect on the short story generated by GenAI, using the questions below as a guide:</p> <ol style="list-style-type: none"> 1. What are the strengths of the story? 2. What are the weaknesses? 3. Do you consider this a good story? 4. What do you think about the creative potential of GenAI? 5. What are the possibilities and limitations?

LLM usage success and impact.

- Students were enthusiastic about the activity.
- Students were able to connect this to the two required readings for the tutorial.
- It led to an animated discussion regarding the uses and limitations of AI as a creative tool.
- The tutor/coordinator found this to be a **productive activity** as it- enabled a **critical analysis** of digital media and **spurred a conversation** on the role of the author in narrative construction as well as ethical considerations and bias in AI authorship.

LLM for summarising and content generation

Staff development

Course	History of Contemporary Spirituality
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Dave Vliegenthart
Email	d.vliegenthart@maastrichtuniversity.nl

The process

The course coordinator explored ChatGPT for this course and found it useful for **summarising** tutorial readings and **drafting parts of students' papers** and **assignments**.

In the future, students may propose their own research assignments, justifying how to meet objectives and ILOs of the course and **suggesting assessment criteria**. They may also include LLM-generated content together with **critical reflections** of their own on both the prompts and the generated content.

The aspects in which LLM assisted

- Research and information gathering
- Content generation
- Assessment and evaluation
- Critical thinking

ILOs	TLAs	Assessment
<p>Learn to...</p> <p>recognise patterns in the socio-historical background of contemporary spirituality;</p> <p>explain how this background has shaped contemporary spiritual beliefs/practices;</p> <p>integrate this background knowledge in critical analyses of popular and academic perceptions of such contemporary spiritual beliefs/practices, including your own.</p>	<p>Interactive introduction lecture (also available as recording afterwards). PBL tutorials.</p>	<p>To accommodate different learning styles, students can choose between:</p> <ul style="list-style-type: none"> - a critical research paper, - a creative research assignment. <p>The <i>research paper</i> is a standard assignment that requires students to apply (part of) the course material to a case (of their choice) connected to the content of the course.</p> <p>The <i>creative research assignment</i> is less standard, albeit still a writing exercise, which allows for slightly more creativity. Students can choose to write a review of a book or documentary (of their choice) connected to the content of the course, which requires them to integrate course material into their critical analysis. They can also choose to write a fictional dialogue between real or imagined figures connected to the content of the course, accompanied by a critical reflection in which they explicitly elaborate how they have implicitly integrated the content of the course into their dialogue.</p> <p>Both assignments have specific criteria and rubrics, which are in my course manual.</p>

LLM usage success and impact

- “Because I significantly probe my students’ grasp of their readings during the tutorials, I felt confident that students themselves would be motivated to invest time in doing their readings themselves. Thus, ChatGPT/LLMs have only impacted my assignments.
- LLMs have encouraged me to add more “creative” assignments as part of the assessment. Not only does the nature of these assignments make it harder for students to rely on LLMs, I hope/expect that the increased freedom of choice will increase their motivation to complete their assignments based on their own knowledge and skills. “

Challenges in using LLM

- “Students who go for one of the “creative” assignments, notably the dialogue option, find it difficult to demonstrate how they have integrated the course materials in it. I am still thinking about how to further clarify my (academic) expectations for these assignments, without confining them again to “standard” research paper guidelines.
- In other words, these assignments are a response to the rise of LLMs, which, I think, makes my assignments more fun for students, but also more difficult for both them and me to align with academic standards. “

LLM for written work feedback

Critical friend

Course	States and Nations in Europe (2000 level)
Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Walter Jansen (EDLAB / FASoS)
Email	walter.jansen@maastrichtuniversity.nl

The process

Students write an introduction for an historical essay and run this through ChatGPT 3.5 for feedback.

1. Prompts given for knowledge, stylistic and language feedback
2. Student gain feedback from ChatGPT and reflect individually on feedback outside the classroom
3. Within the classroom students collaboratively reflect on quality of prompting and feedback
4. Students are expected to integrate useful elements of feedback

ILOs	TLAs	Assessment
Draw on and analyse academic literature to support and strengthen your argumentation	Gain feedback from ChatGPT for written work	Academic essay (country file)

LLM usage success and impact

- Use of LLM was normalized early in writing process
- Students encountered useful feedback with regards to language and style
- Students showed high level of critical reflection and intuition with regards to ChatGPT conversation

Challenges in using LLM

- Knowledge-feedback was regarded as too superficial (practice was run in April 2023)
- Some students did not join because of perceived privacy issues linked to using ChatGPT 3.5

LLM for essay writing

Criticise output

Course	EBS 1006, Economy Game
Faculty	School of Business and Economics (SBE)
Contact	Martin Strobel
Email	m.strobel@maastrichtuniversity.nl

The process

Students are encouraged to utilise AI tools, such as ChatGPT, in a structured way to enhance their **essay writing**. Students are required to divide their essay into two parts: the first involves engaging in a dialogue with an AI about the market characteristics related to their topic, using ChatGPT or another AI of their choice. They must then incorporate relevant extracts from this dialogue into their essay, ensuring that the AI's contributions are clearly identified. This approach allows students to leverage AI for generating substantial content while also demonstrating their own critical thinking and analysis skills.

The aspects in which LLM assisted

- Critical thinking
- Content generation
- Writing skills

ILOs	TLAs	Assessment
<p>In the course, you spent most of your time on the models of competitive markets and oligopolies. Despite the fact that these models predict outcomes in some markets quite well, real life markets are much more complex.</p> <p>Consequently, a discussion of policy measures or market intervention should be preceded by a thorough analysis of the market characteristics. Your task in the essays is to do such an analysis for some specific markets.</p>	-	<p>2 essays</p> <p>Divide your essay into two parts.</p> <ol style="list-style-type: none"> 1. In the first part, have a dialogue with an artificial intelligence about the market characteristics of the market you are discussing. 2. The second part should consist of a thorough investigation of the dialogue. Extract the AI's key statements and find the necessary evidence to support them (or prove them wrong, with supporting evidence).

LLM usage success and impact.

- Use LLM with **sensitivity**: Students cannot easily use solely LLMs to solve problems without finding supporting evidence.
- Students' results showed that LLMs can be valuable, but they should not be taken as entirely accurate or complete without **critical evaluation**.

LLM for presentation design and critical review

Critical friend

Course	EBS4005 Defending a Master thesis
Faculty	School of Business and Economics (SBE)
Contact	Laurie Delnoij
Email	l.delnoij@maastrichtuniversity.nl
Contact	Freddy Schwoerer
Email	fj.schwoerer@maastrichtuniversity.nl

The process

Use ChatGPT to create an outline for their thesis defence presentation based on a summary of their thesis. They further asked ChatGPT to be a reviewer, prompting the LLM to ask them critical questions on their thesis and provide feedback on their answer.

The student used ChatGPT to prepare for their thesis defence by asking it to generate a **detailed outline** for a 15-minute presentation that emphasised and included the criteria given. The AI was also asked to act as a **critical reviewer**, providing seven challenging questions on various aspects of the thesis, including theories, methods, and findings. Additionally, the student sought **feedback** on their responses to these questions to ensure completeness and persuasiveness, and to identify any missing information.

The aspects in which LLM assisted

- Assessment and evaluation
- Feedback
- Communication
- Presentation skills
- Critical thinking

ILOs	TLAs	Assessment
Improving presentation skills Utilising AI tools for academic purposes Self-reflection & feedback utilisation)	Students were randomly picked to share a surprising element in their outline based on the ChatGPT Input during the plenary session. Students asked to reflect on the process and note the next steps in preparing for their thesis defence Q&A	-

LLM usage success and impact

- Perceived as easy to use and helpful.
- 88% state they would use it for future assignments.
- 75% state it saves time & effort compared to using other methods, especially in relation to asking written feedback on academic work.
- Helps with structure and language, as well as generating ideas and structures as a starting point.

Challenges in using LLM

- Responses not always reliable & accurate, repeated prompting required to achieve critical responses and meaningful feedback. Otherwise, answers may be too generic.
- Not necessarily better for improving comprehension of learning.
- Prompting can be difficult without guidance.
- Answers often sycophantic – wanting to please the user.

LLM for story creation and narrative analysis

Criticise output

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Faculty	University College Maastricht (UCM) Faculty of Science and Engineering (FSE)
Contact	Robyn Ausmeier (FASoS)
Email	r.ausmeier@maastrichtuniversity.nl

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LLM to optimise teaching style

Staff development

Course	Business Process Management (Information Management and Business Intelligent (IMBI))
Faculty	School of Business and Economics (SBE)
Contact	Michalina Kaminska
Email	michalina.kaminska@maastrichtuniversity.nl

The process

The tutors/coordinator of the courses make use of ChatGPT for their teaching style and this course aims to teach students to use ChatGPT.

The aspects in which LLM assisted

- Content and exam generation
- Course development

ILOs	TLAs	Assessment
Learn to use ChatGPT	Students attended a lecture on prompting Students redesigned a process with ChatGPT. The description was used as an input for their modelling activity.	Exam

LLM usage success and impact

- Generate exam questions with answer keys.
- Create case study for the courses.
- Useful to write paragraphs/emails with prompting bullet points.
- Useful to create different examples or creative explanations.