

# GenAI VOOR BACHELOR- EN MASTERPROEVEN: ONDERZOEKSMETHODOLOGIE

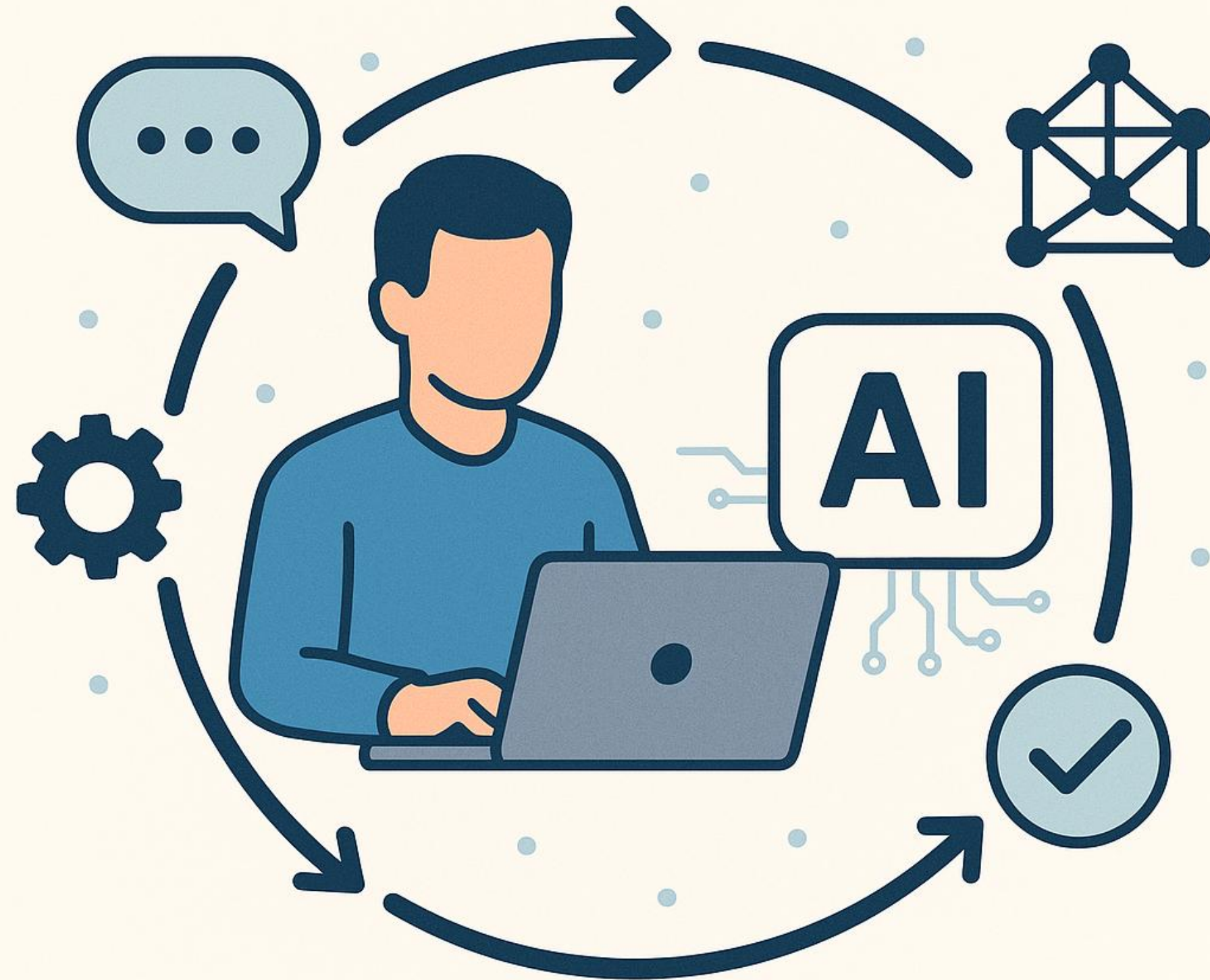
Jasper Degraeuwe – 16 oktober 2025

Ondersteuningsaanbod GenAI voor lesgevers en studenten LW – AJ25-26, 1ste semester

# ABOUT ME

- Department of Translation, Interpreting and Communication
- PhD on **Intelligent Computer-Assisted Language Learning (ICALL)**  
 $\text{ICALL} \approx \text{CALL} + \text{AI and NLP}$
- Postdoctoral researcher on **educational technologies and AI for language learning**

# DISCLAIMER



**HUMAN IN THE LOOP**

# COGNITIVE COST OF BLIND AI USE

As the educational impact of LLM use only begins to settle with the general population, in this preliminary study we demonstrate the pressing matter to explore further any potential changes in learning skills based on the results of our study. The use of LLM had a measurable impact on our participants, and while the benefits were initially apparent, as we demonstrated over the course of 4 sessions, which took place over 4 months, the LLM group's participants performed worse than their counterparts in the Brain-only group at all levels: neural, linguistic, scoring.



# Bacon ice cream and nugget overload sees misfiring McDonald's AI withdrawn

18 June 2024

Share  Save 

**Tom Gerken** Technology reporter





# Taco Bell rethinks AI drive-through after man orders 18,000 waters

29 August 2025

Share  Save 



**Shiona McCallum** Senior Tech Reporter





# Meta investigated over AI having 'sensual' chats with children

18 August 2025

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**Charlotte Edwards** Technology reporter, BBC News



Getty Images



# HUMAN WITHOUT THE AI LOOP

- Starting point: is use of AI necessary / beneficial?
- 30-min chat with supervisor versus 30-min chat with chatbot

# GUIDELINES ON GENERATIVE AI



# GHENT UNIVERSITY

- Overarching guidelines → “responsible” use is allowed
  - University: <https://www.ugent.be/genai>
  - Faculty: Ufora “[INFOSITE Faculteit Letteren en Wijsbegeerte](#)”
- ***Leerpap* for teachers and for students (updated!)**
- Onderzoeks- en onderwijstips (more *ad hoc*)
- Other workshops/courses (e.g., on UTOP)

Een **verantwoord gebruik** van generatieve AI is **altijd toegelaten tenzij** een lesgever het gebruik bij (een deel van) een taak expliciet verbiedt, waardoor die taak in een gecontroleerde setting moet plaatsvinden.



## Generatieve AI aan de UGent

De UGent kiest voor een verantwoord gebruik van generatieve AI. Onder verantwoord gebruik verstaan we de volgende kernwaarden:

- **Verantwoordelijkheid en onafhankelijk handelen** – je bent en blijft verantwoordelijk voor wat je doet met de tools,
- **Eerlijkheid en kritische houding** – je checkt de betrouwbaarheid en de bron van de output van de tools, in het kader van auteursrechten, en je bent, waar nodig, eerlijk over het gebruik van de tools,
- **Respectvol gebruik** – je bent je bewust van mogelijke vooroordelen en bias in de output van de tools,
- **Zorgvuldig en duurzaam gebruik** – je zet mogelijke efficiëntie door AI-gebruik af tegenover het energieverbruik.
- **Veilig en vertrouwelijk omgaan met informatie** – je uploadt geen confidentiële en vertrouwelijke data,
- **Voorbeeldgedrag** – je leeft bovenstaande kernwaarden na en wordt zo een voorbeeld voor anderen.

Meer informatie over verantwoord gebruik vind je in het [Universiteitsbrede richtkader voor het verantwoord gebruik van AI aan de UGent](#).

# FACULTY L&W

- Mandatory report for writing tasks
- Template and guidelines available on Ufora info site





# OVERVIEW

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1. GenAI in pre-research phase
2. GenAI as part of research methodology
  - A. “LLM as a judge”
  - B. Synthetic data
  - C. Questionnaires
3. Important observations / pitfalls

**→ Hands-on and interactive!**



# 1. GenAI IN PRE-RESEARCH PHASE

# LITERATURE REVIEW

- Elicit
- SciSpace
- Perplexity with “Academic (Search academic papers)” functionality toggled on
- Copilot / ChatGPT / ... with “web search” and “deep research” functionalities toggled on

! ONLY OPEN-ACCESS PUBLICATIONS

# LITERATURE REVIEW: HUMAN IN THE LOOP

- Search Web of Science, Google Scholar, ...
- (Quick)read papers and look up relevant cited papers
- Meet up with supervisor
- Guidelines and tips & tricks offered during BAP/MAP courses

# FORMULATE RESEARCH QUESTION

**= GenAI as idea generator**

- Ask for summary of state of the art
- Ask for research gaps
- The more concrete the starting point, the better



# 2. GenAI AS PART OF RESEARCH METHODOLOGY

# A. LLM AS A JUDGE

## A. LLM AS A JUDGE

- LLM = large language model
- Core principle = using an LLM to evaluate data instances by scoring or labelling these instances
- Typically refers to judging quality of AI-generated content, but essentially applicable to any target setting

# EXAMPLE (AI-GENERATED CONTENT)

- **Question:** *Who is the president of the United States?*
- **Answers generated by LLM\_1**
  - **A:** Donald Trump
  - **B:** Donald Duck
  - **C:** A white-haired, orange-faced, old American citizen
- **Prompt to LLM\_2** (= the “judge”): *What is the best answer to the question and what is the worst answer to the question?*
- **Evaluation generated by LLM\_2:** best=A | worst=B



# EXAMPLE (RESEARCH DATA)

- **Research data instances**
  - **A:** Jasper and graphic design, a match made in hell
  - **B:** Jasper and graphic design, room for improvement
  - **C:** Simply the best: Jasper revolutionises world of graphic design
- **Prompt to LLM** (= the “judge”): *What headline has the most positive sentiment towards the subject’s graphic design skills and what headline has the most negative sentiment?*
- **Evaluation generated by LLM\_2:** best=C | worst=A

# WHEN POTENTIALLY USEFUL?

- Large digital dataset (text, images, audio, video) to which you want to apply time-consuming and/or labour-intensive analysis (e.g., diachronic corpus, word lists, student responses)
- AI can analyse huge amounts of data in very little time  
→ enables you to analyse more data

# “JUDGING” METHODS

- Best-worst scaling
- Pairwise comparison without reference
- Pairwise comparison with reference
- Binary labelling (e.g., yes/no, true/false)
- Categorical labelling (e.g., positive-neutral-negative)
- Numerical labelling (e.g., Likert scale)

# LIVE DEMOS

- Best-worst scaling to obtain topic-based rankings
- Pairwise comparison for sentiment analysis on news headlines across time



# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)
- **Few-shot prompting (= add series of examples to question)**

# EXAMPLES

 **You**

Give me three example sentences of no longer than 20 words that clarify the meaning and usage of the word "ubiquitous".

 **ChatGPT**

1. Smartphones are now ubiquitous, found everywhere from bustling cities to remote villages.
2. The internet has made information ubiquitous, accessible to anyone with a connection.
3. Coffee shops are ubiquitous in urban areas, appearing on nearly every street corner.



# EXAMPLES



## **You**

ubiquitous → Sentence 1: "Smartphones are now ubiquitous, found everywhere from bustling cities to remote villages." | Sentence 2: "The internet has made information ubiquitous, accessible to anyone with a connection." | Sentence 3: "Coffee shops are ubiquitous in urban areas, appearing on nearly every street corner."

nonplussed →



## **ChatGPT**

Sentence 1: "Despite her best efforts, Jane was nonplussed by the unexpected turn of events, unsure of how to react." | Sentence 2: "The politician remained nonplussed by the reporter's probing questions, maintaining a calm demeanor throughout the interview." | Sentence 3: "His nonplussed expression betrayed his confusion at the complex instructions given by his boss."



# WHERE IS THE HUMAN IN THE LOOP?

- Take subset from the dataset and apply same type of analysis but now with human participants
- Calculate correlation between human and AI judgements



# B. SYNTHETIC DATA

# WHEN POTENTIALLY USEFUL?

- You need more data than you can gather / than is available
- AI tool can take over part of data collection process by **generating data that is similar to reference data** or data that complies with series of criteria included in prompt
- Typically for training or testing (machine learning) models

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)
- **Few-shot prompting (= add series of examples to question)**

# EXAMPLES

- Testing fraud detection models on simulated transactions
- Creating synthetic student performance data to develop and test adaptive learning platforms and educational tools
- Producing synthetic energy consumption data to forecast energy demand, optimise grids, and test renewable energy integration

## EXAMPLE AT VTC

- Automatically create suitable practice speeches for conference interpreting training programmes

# LIVE DEMO

– Suggestions?



# C. QUESTIONNAIRES

# WHEN POTENTIALLY USEFUL?

- Generate first draft of survey questions based on your research objectives, target population, and key variables (*“Create a 10-question survey about ...”*)
- Suggest question types (yes/no, Likert, open text, ...)
- Rephrase questions
- Check if questionnaire meets regulatory requirements (e.g., GDPR)

# ALL-IN-ONE FORMULA

- Qualtrics (survey tool for which UGent bought a license) is introducing AI functionalities

# 3. IMPORTANT OBSERVATIONS / PITFALLS

# IMPORTANT OBSERVATIONS

- Write clear instructions
- If possible, have your data labelled in the most structured way possible (CSV, JSON, ...)
- Be careful when introducing personal data into AI-tools  
→ **always anonymise**

# PITFALLS

- Bias in models (e.g., gender bias)
- Concept of “authentic data” from online sources



# WHAT'S NEXT?

# UPCOMING SESSIONS

- Sessions on other phases of research
  - Data visualisation
  - Research integrity
  - Data analysis
- Registration
  - <https://event.ugent.be/registration/OndersteuningGenAIlesgevers>
  - <https://event.ugent.be/registration/OndersteuningGenAIStudenten>

# RELEVANT SOURCES

- UGent page on GenAI
- Ufora info sites and “leerpaden”
- Website on AI-driven tools and resources for (language) education: <https://vakgroep-vtc-universiteit-gent.github.io/>

# INTERESTED IN SUPPORT?

- Send email to [vtc.aisupport@ugent.be](mailto:vtc.aisupport@ugent.be)
- Include
  - Topic of bachelor paper / master's thesis
  - Short description of envisaged research
  - In what part of research planning to use GenAI and what type of support needed?
- **Before Friday 14 November 2025**

# JOUW STEM IS BELANGRIJK

- Wat vond je van deze workshop?
- Wie wil deelnemen aan panelgesprek over GenAI?  
Inspiratienamiddag voor facultaire  
onderwijsondersteuners op donderdag 27 november  
([Nele.Kellens@UGent.be](mailto:Nele.Kellens@UGent.be))
- Getuigenissen en concrete ervaringen gezocht om  
anoniem te delen ([Jasper.Degraeuwe@UGent.be](mailto:Jasper.Degraeuwe@UGent.be))

# **AI is like teenage sex:**

*“Everyone talks about it,  
nobody really knows how to do it,  
everyone thinks everyone else is  
doing it, so everyone claims they  
are doing it.”*

Credit: Dan Ariely



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