



Empowering students with AI

Freezing Week Keynote

Juhani Merilehto

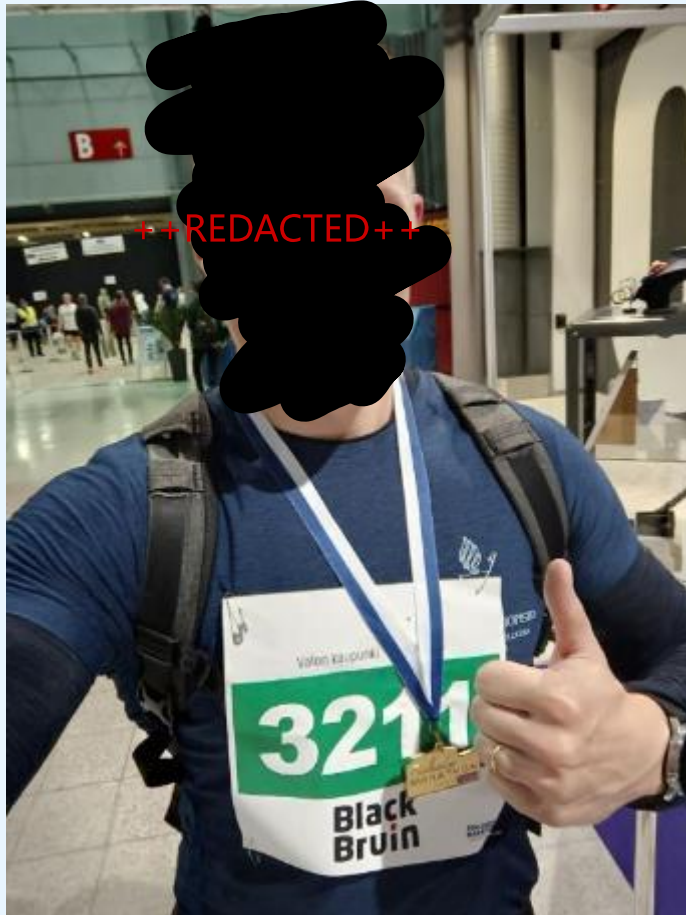
This keynote

- Generative AI – a short recap
- Usage – What do we know?
- Tools of the trade – GPT-4
- Empowered use-cases
- Challenges
- Outro





Juhani Merilehto



- **Doctoral Researcher** – DSc. (Admin.) in Social and Health Management
- **MSc. Student in Cybersecurity (est. 03/2024)**
- **MSc. in Security and Strategic Analysis**
- **MSc. in Cognitive Sciences**
- **MSc. (Econ.) in Information Systems**
- **Specialist** in Data and Statistic analysis at **JAMK**
- **OSINT-Analyst** (Freelancer)



How can one empower students to success?



Create Generative
AI Policy



Teach students
how to use GenAI



Enable & Integrate
into learning





Common questions by students

- If I use AI, can it be detected? **No.**
- Will I get sued for breaking copyright if I use AI images/text? **No.**
- Do I have to pay to use AI? **No.**
- Can AI do my Thesis? **No.**
- Do I need a technical background to use AI? **No.**
- Can AI do my assignments? **Yes.**
- Will AI give only made-up or others stuff? **No.**
- Do I need to know English to use AI? **No.**

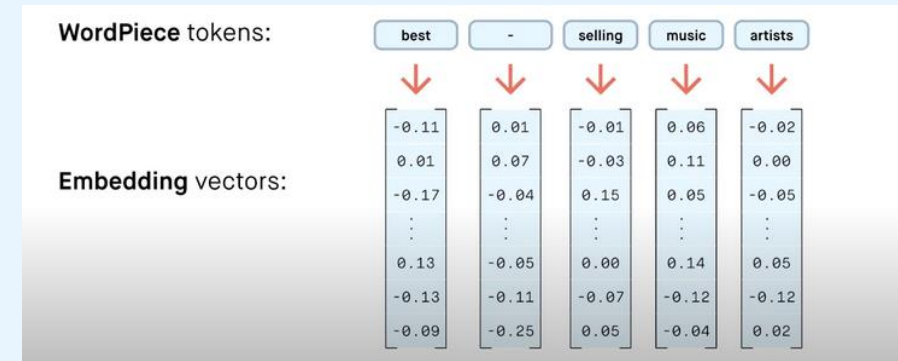
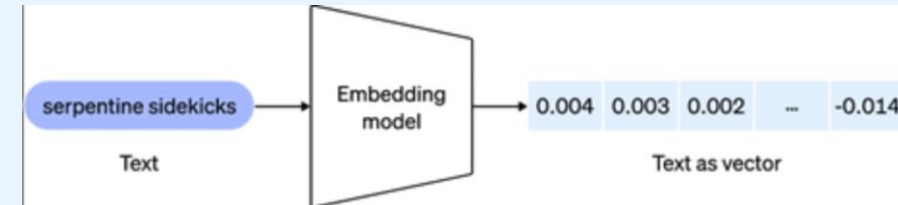




Short recap: Generative AI – the LLMs

Transformer models

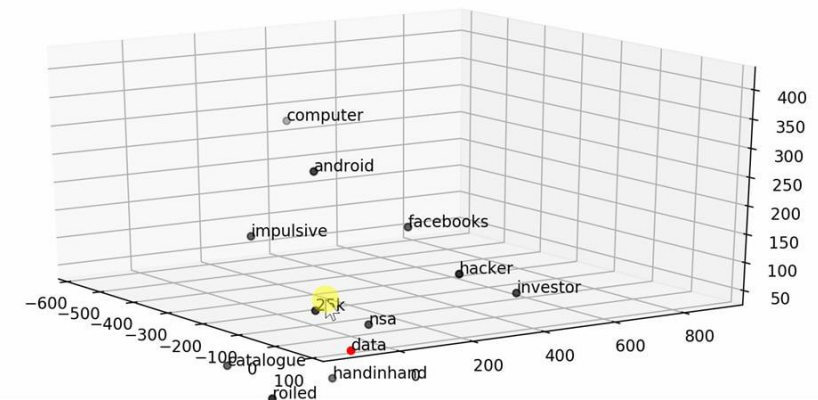
- Attention is all you need (Vaswani et al. 2017)
- Hardware evolution (A100)
- Context understanding



Tokens
30

Characters
105

I'm sorry, but the conference hasn't started yet. The conference is on June 8th and 0th, from 8am to 6pm.





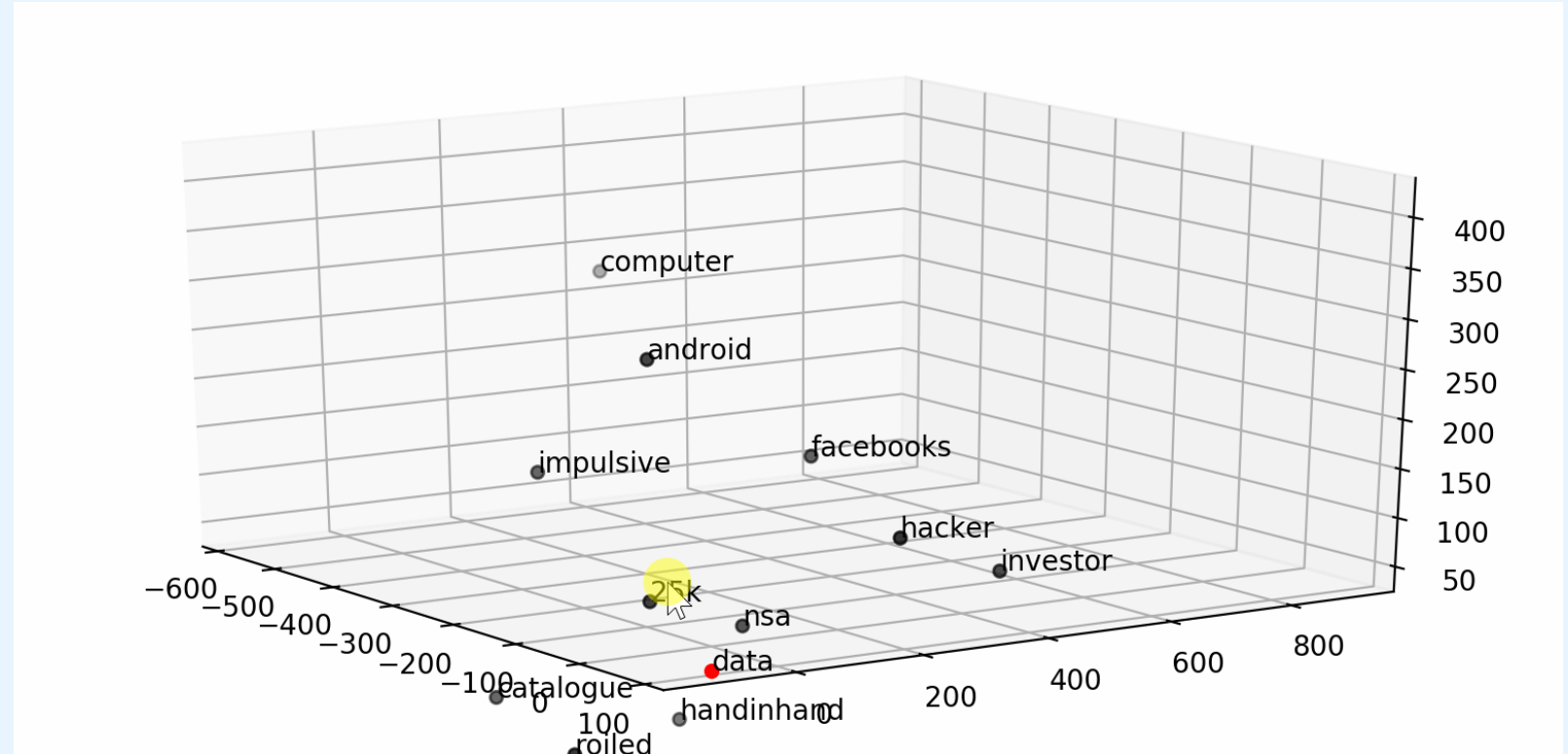
Generative AI – the LLMs

The best thing about AI is its ability to

learn	4.5%
predict	3.5%
make	3.2%
understand	3.1%
do	2.9%

Tokens Characters
30 105

I'm sorry, but the conference hasn't started yet. The conference is on
June 8th and 9th, from 8am to 6pm.

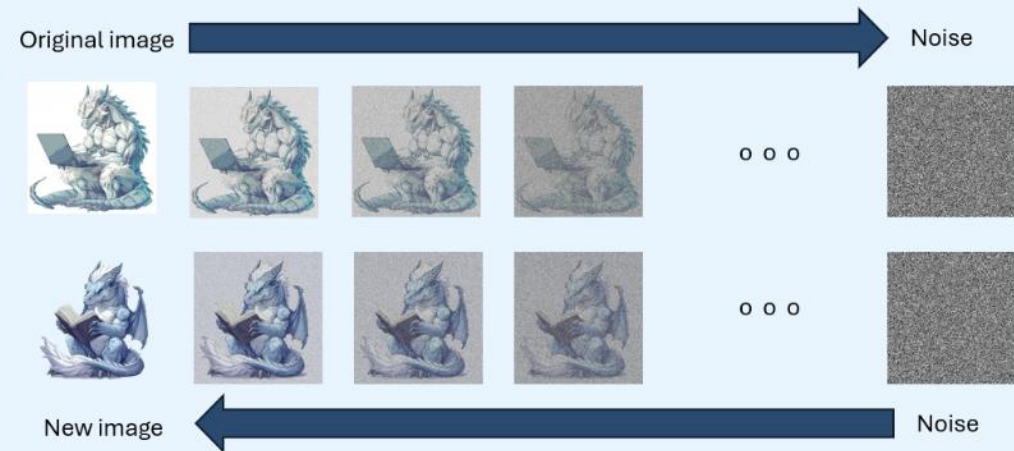


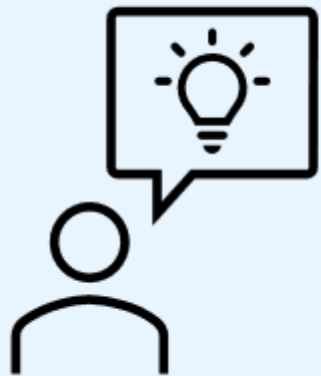


Generative AI – the Stable Diffusion models

Stable Diffusion models

- Deep learning algorithm
- Text-to-Images
- Examples: MidJourney, DALL·E 3, Stable Diffusion





User prompt:

“Arctic Dragon sitting and reading a book.”

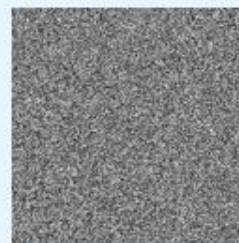


Original image



o o o

Noise

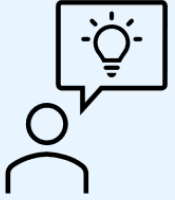


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Noise

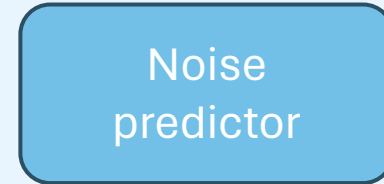
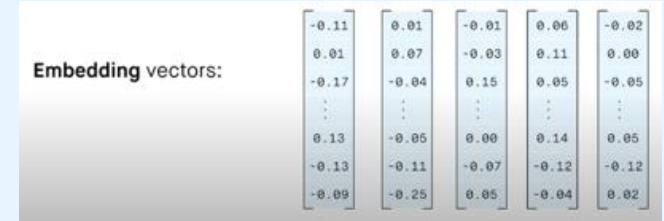
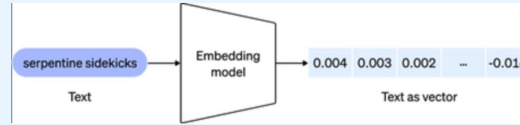


New image



User prompt:

“Arctic Dragon sitting and reading a book.”



New image



o o o

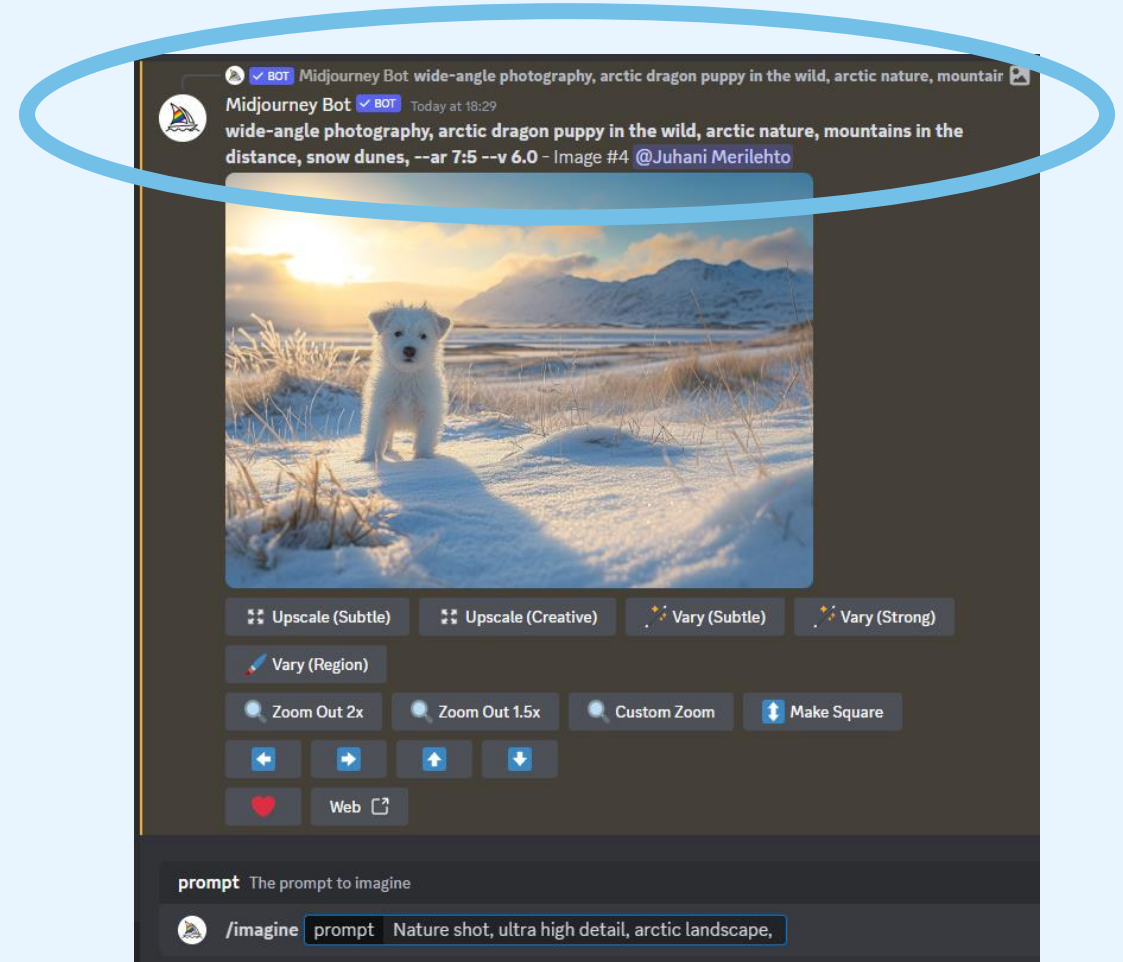
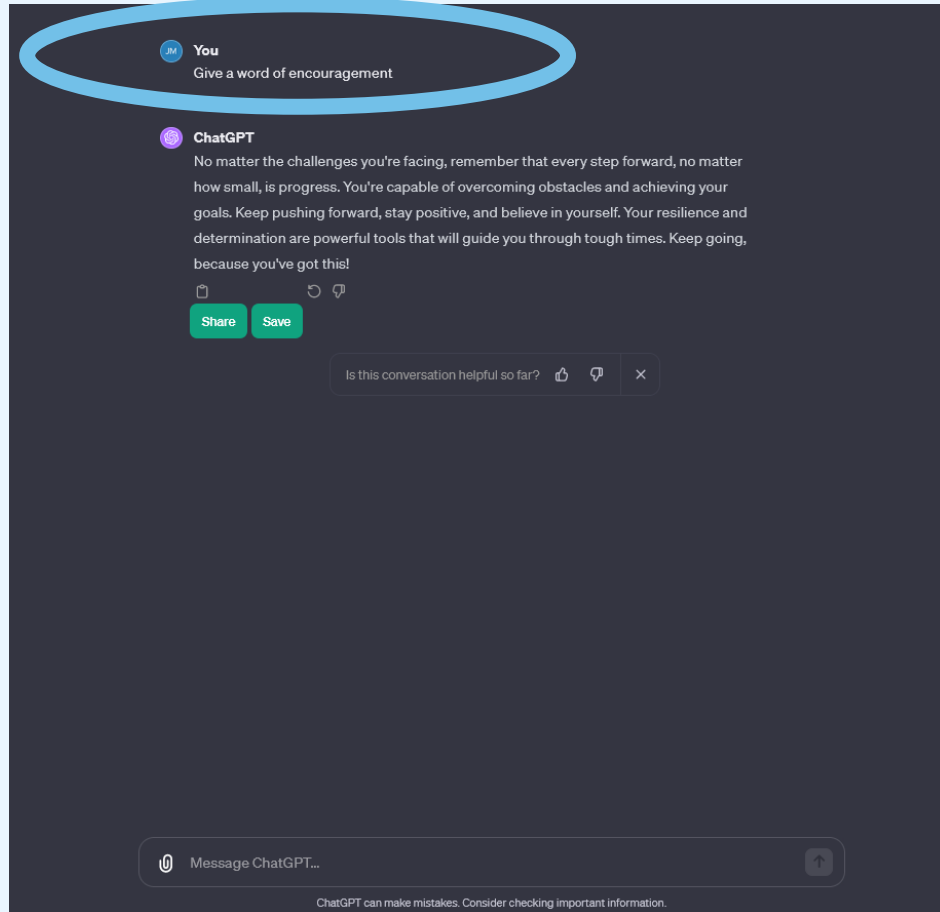


Noise





Probabilities = Magic





Reality of capability



OpenAI
ChatGPT **4.0**

Everything else

ANTHROPIC

 Bard



Beating exams



OpenAI
ChatGPT 4.0



Exam results (ordered by GPT 3.5 performance)

Estimated percentile lower bound (among test takers)

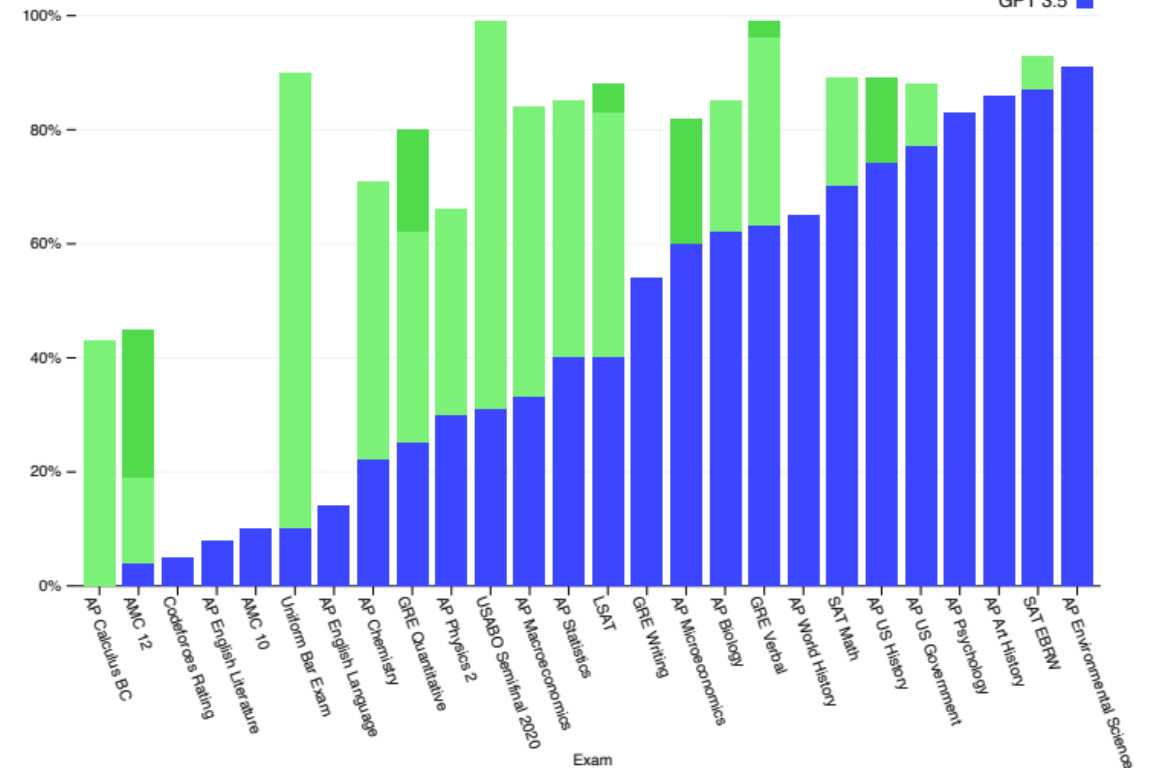


Figure 4. GPT performance on academic and professional exams. In each case, we simulate the conditions and scoring of the real exam. Exams are ordered from low to high based on GPT-3.5 performance. GPT-4 outperforms GPT-3.5 on most exams tested. To be conservative we report the lower end of the range of percentiles, but this creates some artifacts on the AP exams which have very wide scoring bins. For example although GPT-4 attains the highest possible score on AP Biology (5/5), this is only shown in the plot as 85th percentile because 15 percent of test-takers achieve that score.

On the level / above experts

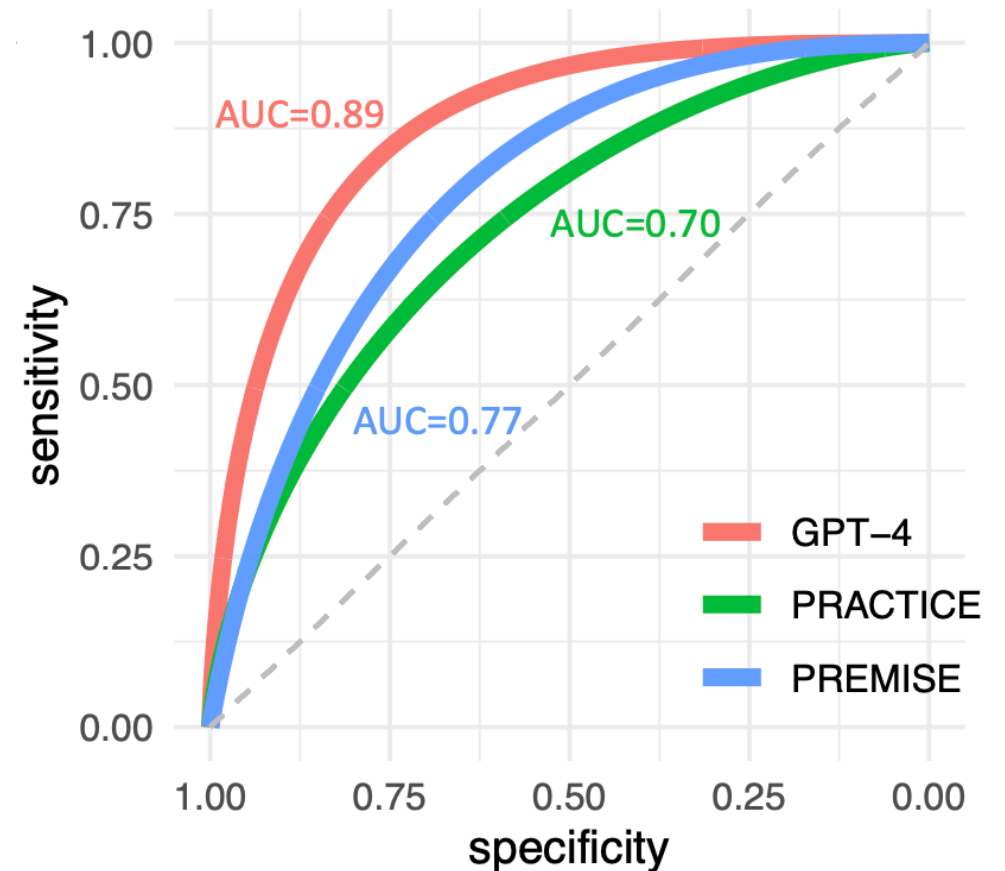


OpenAI
ChatGPT **4.0**

Data from 100 patients with strokes was given to **GPT-4** & an experts:

1) GPT-4s treatment suggestion agreed with the expert in 80 cases, in 5 it was right & expert wrong, in 5 expert was right & AI wrong, 10 were judgement.

2) GPT-4 predicted mortality better than specialist AIs



When used by students



OpenAI
ChatGPT **4.0**

Figure 1: Quality Distributions with and Without AI—Complaint Drafting

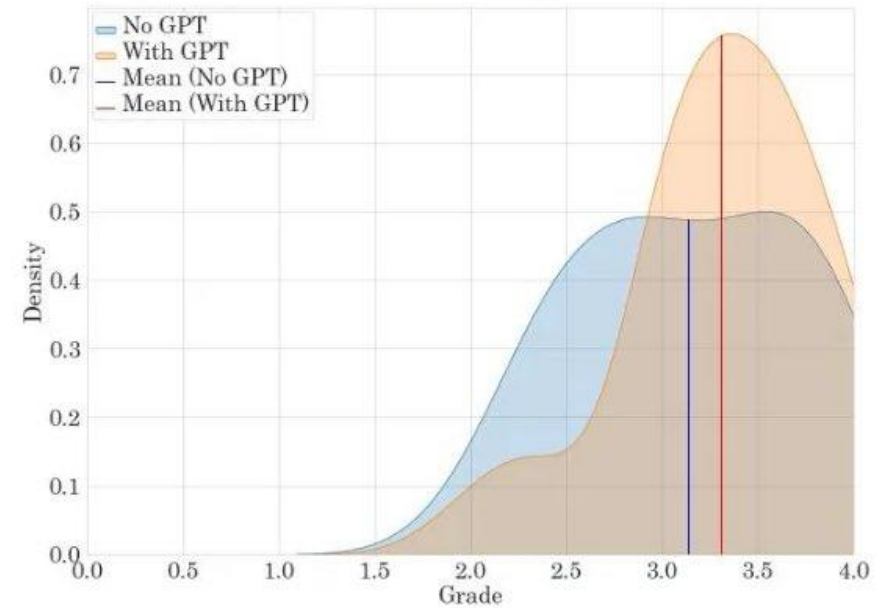
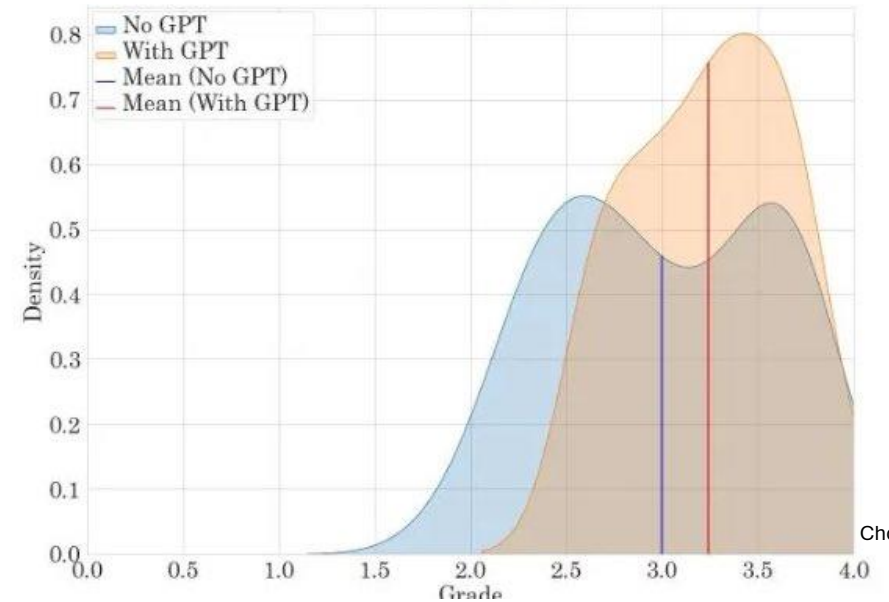


Figure 2: Quality Distributions with and Without AI—Contract Drafting

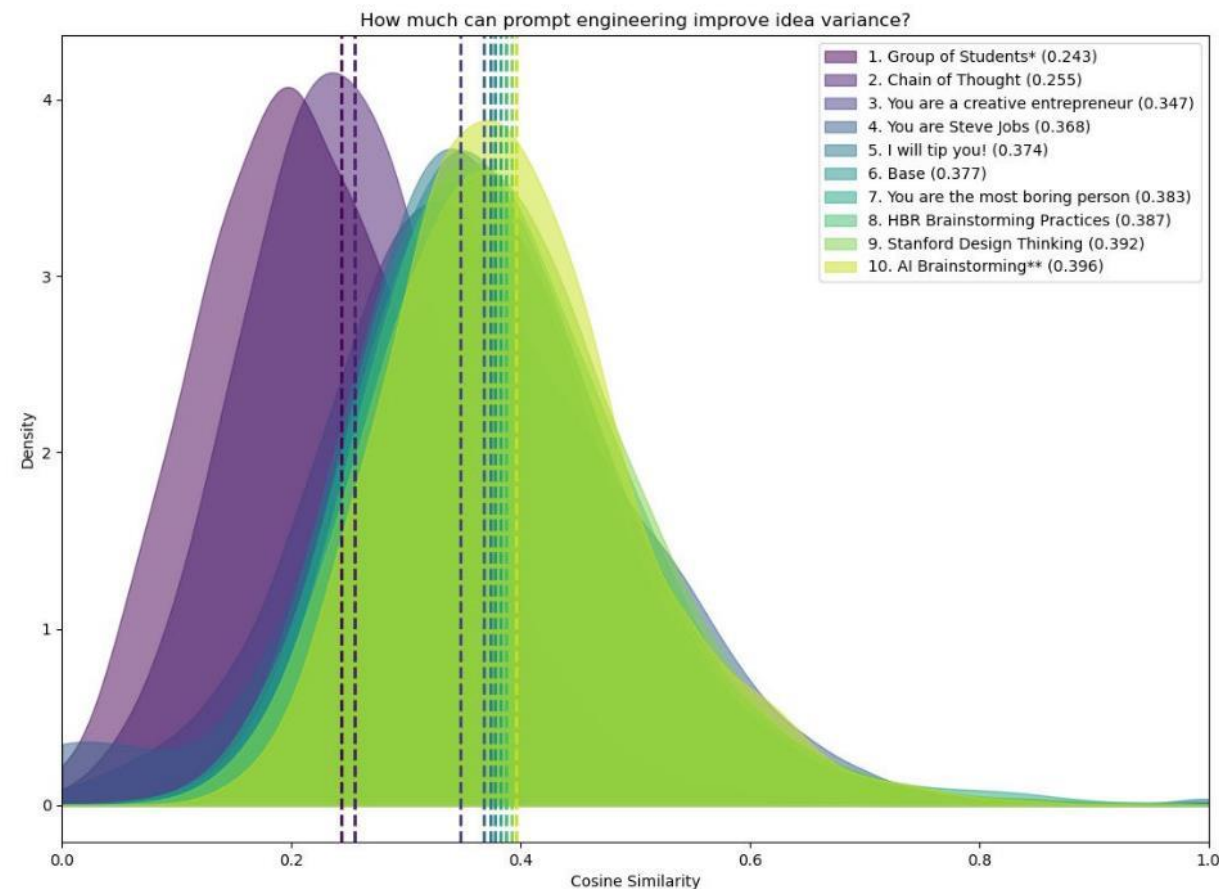




When used by students



OpenAI
ChatGPT **4.0**



* = Wharton MBA students, ideas aggregated from multiple students ** = AI Brainstorming involves multiple independent ideation sessions that are aggregated by GPT



Choices, choices



Plus

For individuals looking to amplify their productivity

\$20 per user
billed monthly

[Start now ↗](#)

Everything in Free, and:

- ✓ Access to GPT-4, our most capable model
- ✓ Browse, create, and use GPTs
- ✓ Access to additional tools like DALL-E, Browsing, Advanced Data Analysis, and more



24 x A. Le Coq
Premium 4,5% olut
0,33 l tlk salkku

Kalkki A. Le Coq -tuotteet

30,48 €

3,39 €/l

* sis. pantin 3,60 €

18+



Google Bard

Bard

bard.google.com/chat/dd8d335b5f14d596

Bard Experiment

+ New chat

Recent

Bridging Cognition & Pedag...

Take the role of a professor in Cognitive Sciences, give me five ideas for essays that combine at least two theories and connect it with pedagogy. Answer with only the titles as bullet points.

View other drafts

✦ Essay Ideas in Cognitive Sciences and Pedagogy:

- Learning through Schemas: Integrating Piaget's Developmental Stages with Constructivist Teaching Practices
- Memory in the Classroom: Exploring the Interplay of Encoding, Consolidation, and Retrieval for Effective Learning
- Attention Matters: Leveraging Motivation and Cognitive Load Theory to Optimize Student Engagement
- From Neurons to Narratives: Storytelling as a Tool for Scaffolding Higher-Order Thinking Skills
- Beyond Rote Repetition: Examining Spacing and Interleaving Effects for Meaningful Learning in Language Acquisition

Enter a prompt here

1-click prompts Web access

Helsinki, Finland
From your IP address · Update location

Bard may display inaccurate info, including about people, so double-check its responses. [Your privacy and Bard](#)





Anthropic – Claude 2 (UK/US)

What can I help you with?

Claude
by
ANTHROPIC

shift + ↵ to add a new line, Ctrl + K to create a new chat

Message Claude...

© Claude.ai is in beta release and may display incorrect or harmful information





Microsoft Bing / Copilot

 Microsoft Bing

 SEARCH

 COPILOT

More Creative

More Balanced

More Precise

 You

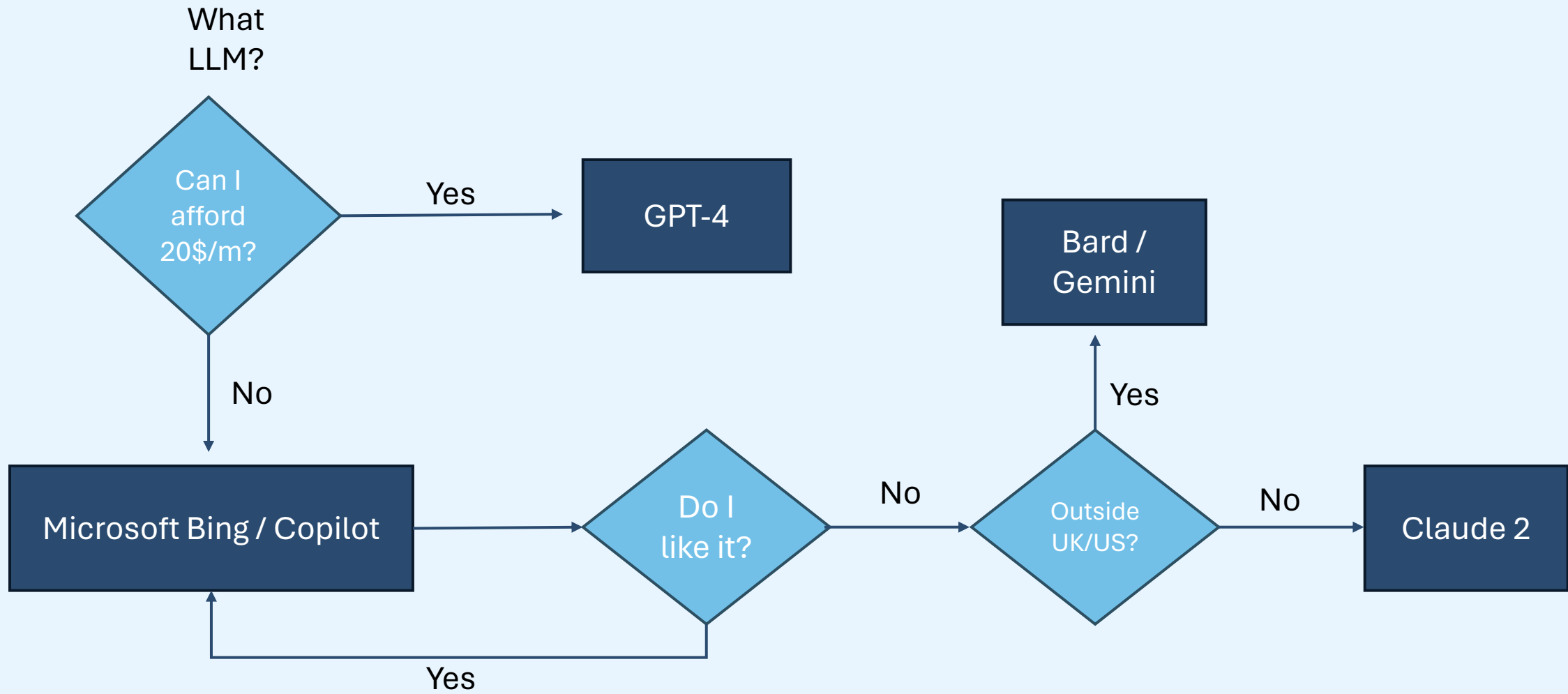
Take the role of a senior lecturer in international business. Write one condense sentence, that would work as a title for a new course that teaches Generative AI. First, recognize the relevant scope of the topics in which Generative AI can be connected, and then pick those that are most impactful. Give response only as title of the course. Example response: "Generative AI in Global Human Resource Management".

 Copilot

This is an interesting challenge. Generative AI is a branch of artificial intelligence that can create novel content such as text, images, music, and code. It has many potential applications in various domains of international business, such as marketing, innovation, strategy, and ethics. Here are some possible titles for a new course that teaches Generative AI:

- **Generative AI for Global Marketing and Branding:** This course will explore how generative AI can help businesses create engaging and personalized content for their global customers, such as slogans, logos, ads, and social media posts. It will also discuss the ethical and legal implications of using generative AI for marketing purposes.
- **Generative AI for International Innovation and Entrepreneurship:** This course will examine how generative AI can foster creativity and innovation in the global business







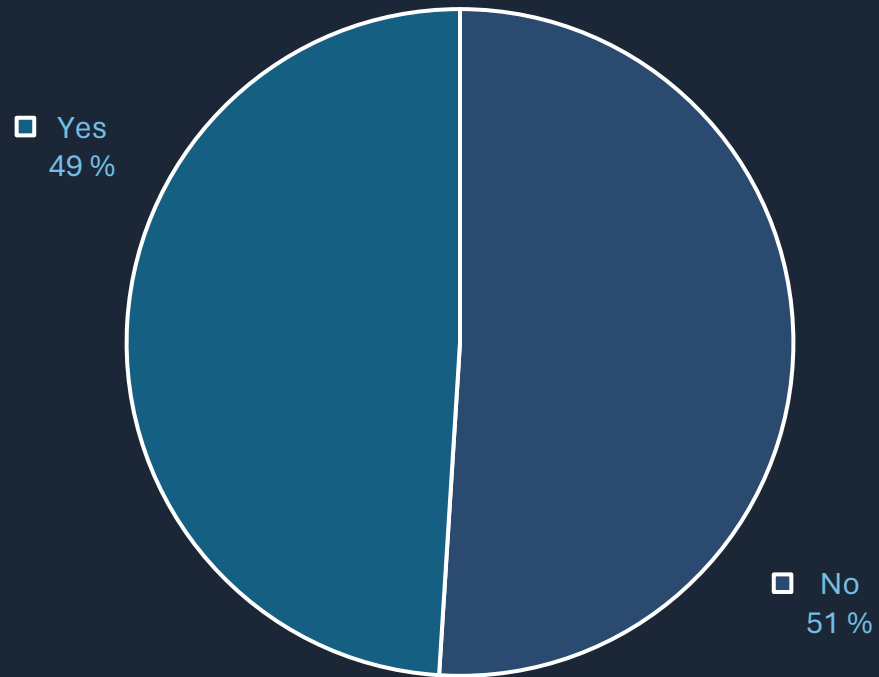
Are they used by students and how?



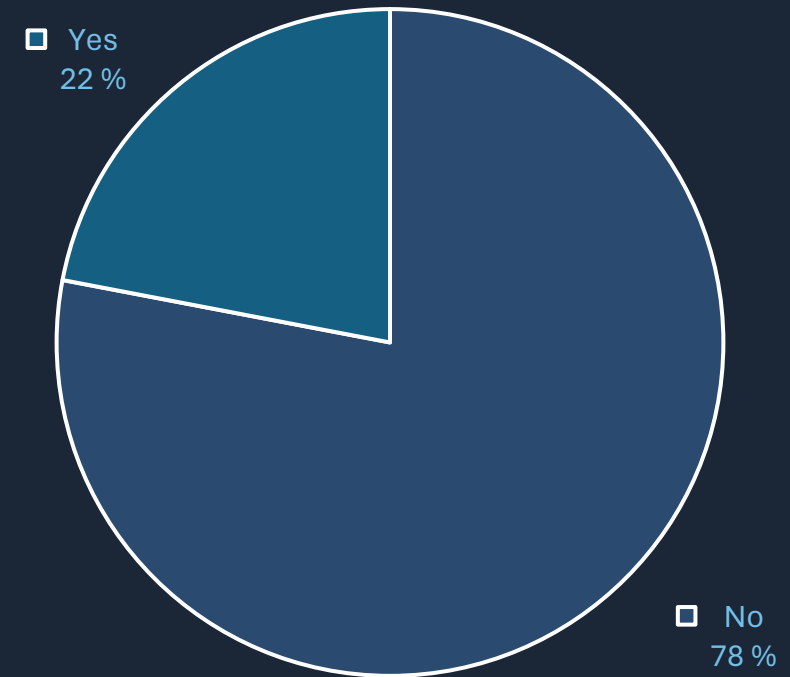


Use of Generative AI

Students



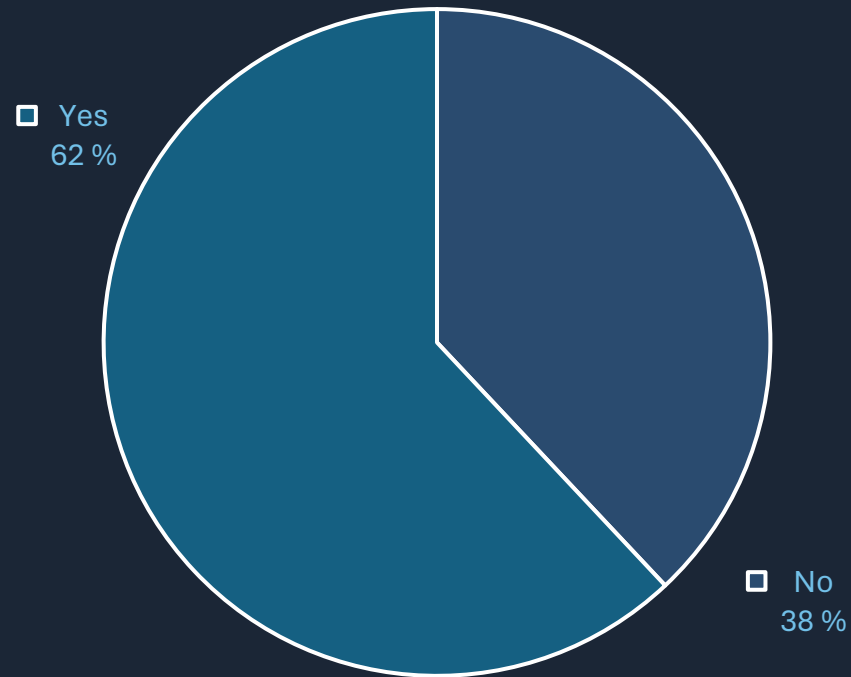
Faculty





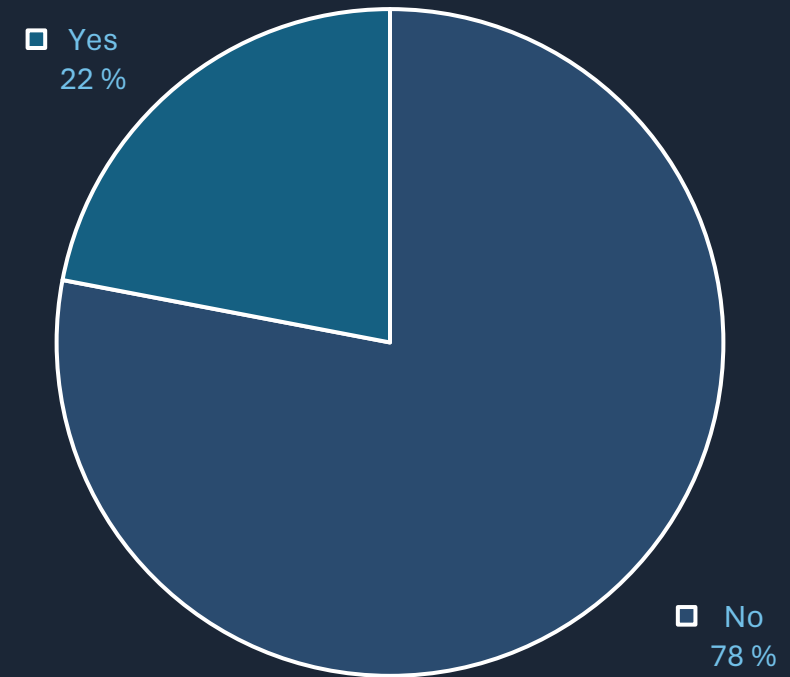
Use of Generative AI

Students (TEK, 2023)

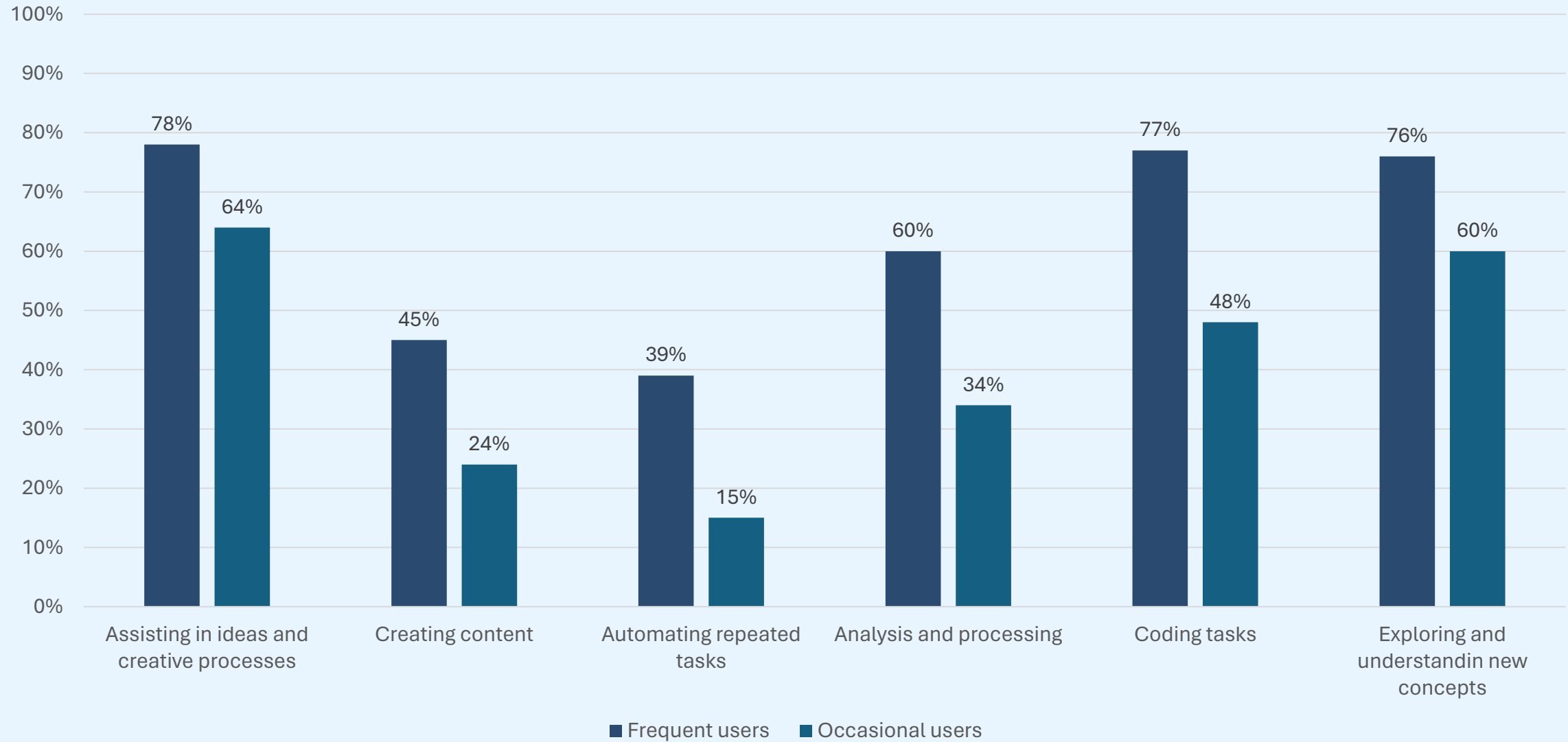


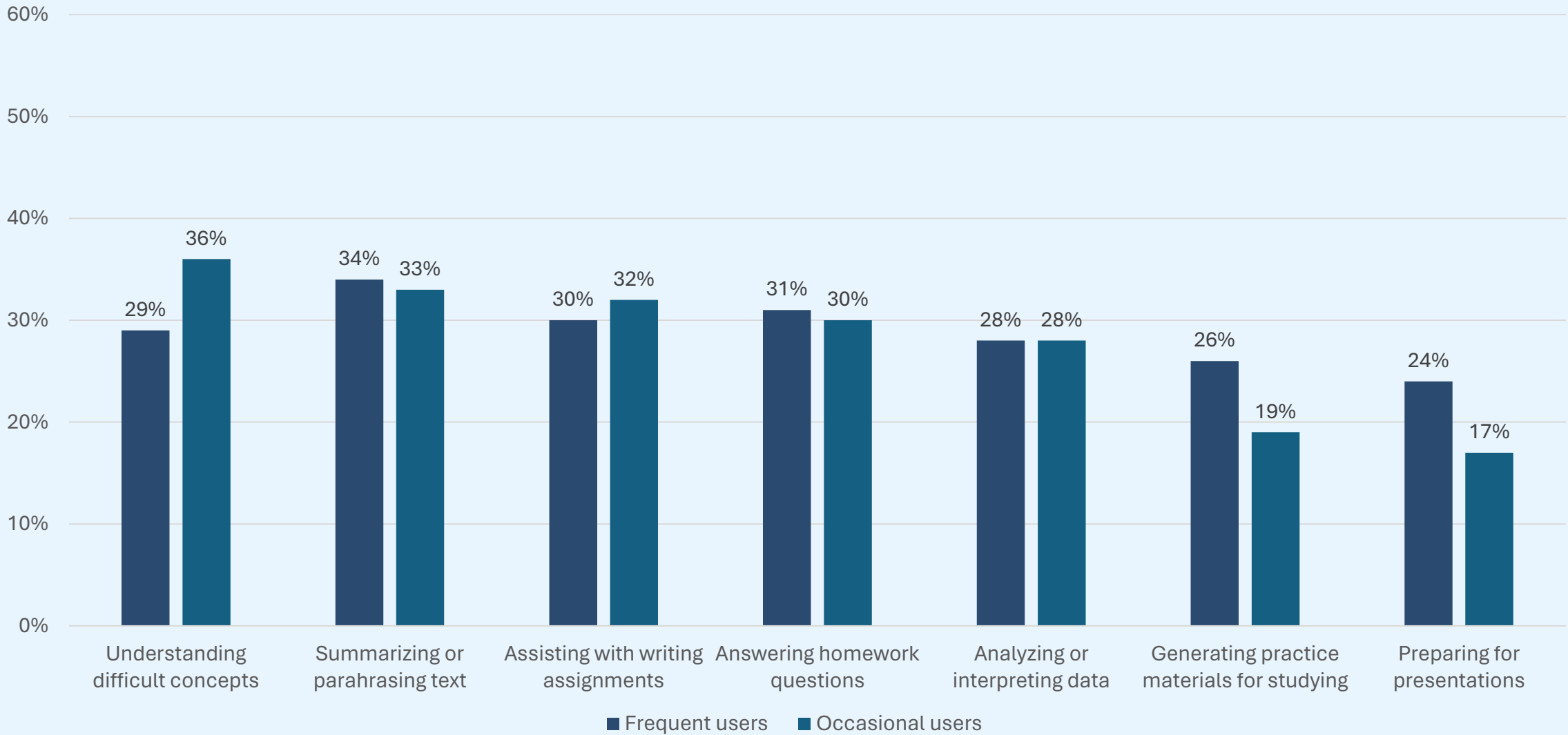
TEK, 2023

Faculty



GenAI-Update 2023. Tyton Partners







Yeah, yeah, I can google this, where is the empowerment?





JYU-Thesis-GPT

By Juhani Merilehto

University of Jyväskylä Thesis Tutor



You

Can you summarize the JYU grading matrix?



JYU-Thesis-GPT

The JYU grading matrix for Master's theses in Information Technology, Information Systems Science, and Cognitive Science outlines the criteria for evaluating theses based on six main categories:

1. **Complexity of the Topic and Definition of the Research Problem:** Evaluates how well the research problem and questions are defined, the significance of the research, and the identification of key concepts. It ranges from poorly defined problems with unclear significance to well-defined, significantly motivated problems that contribute new knowledge to the field.
2. **Selection and Mastery of Sources:** Assesses the breadth and depth of scientific literature used, from a superficial use of sources without a coherent synthesis to a comprehensive, high-quality literature review that demonstrates deep understanding and conceptual mastery of the topic.
3. **Choice and Application of Research Methodology:** Reviews the suitability and application of research methods for data collection and analysis. The criteria range from inappropriate method choice and poor application to excellent justification of chosen methods and adept application, ensuring reliable and valid results.
4. **Presentation of Results:** Focuses on how results are reported, from a superficial presentation that hinders understanding and interpretation to an excellent presentation that clearly contributes to practical or scientific knowledge.
5. **Interpretation and Discussion of Results:** Considers the depth of result analysis and discussion, from inadequate interpretation and discussion to systematic, broad, analytical, and critical examination, reflecting on the practical and scientific significance of the results.
6. **Language, Finalization, and Structure of the Thesis:** Evaluates the linguistic quality and structural coherence of the thesis, from poorly written and structured reports to stylistically and linguistically flawless, well-structured reports that adhere to the university's reporting guidelines.

Each category is graded on a scale from 1 (poor) to 5 (excellent), with specific criteria detailing the expectations for each grade level. The matrix provides a comprehensive framework for evaluating the quality and academic rigor of Master's theses, ensuring they meet the university's standards for research, analysis, presentation, and contribution to the field.



Share

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You



Merilehto 2023 IT Army of Ukraine as C...
PDF

Here is a draft of my MSc. thesis, can you grade it for me before I send it to my supervisor?



JYU-Thesis-GPT



Searching my knowledge



JYU-Thesis-GPT

The thesis "IT Army of Ukraine as Complex Adaptive System" by Juhani Merilehto presents a comprehensive case study of the IT Army of Ukraine (ITAU) utilizing the theory of Complex Adaptive Systems (CAS). It explores how the ITAU, as an ad-hoc state-sponsored cybergroup, operates within the dynamic context of cyberwarfare. The study focuses on CAS characteristics found in ITAU, including adaptation, nonlinearity, emergence, self-organization, feedback, diversity, cooperation, communication, co-evolution, and contextuality. Through detailed analysis, the thesis contributes to cyberwarfare literature by offering insights into ITAU's operations and the applicability of CAS theory in analyzing cybergroups.



No success!



You

Can you give a grading estimate for it?



JYU-Thesis-GPT

Based on the JYU thesis evaluation criteria and without accessing the full content of your thesis, I can only provide a general guidance on what aspects are considered in the grading process:

Tried more specific
prompting tactic



 You



Merilehto 2023 IT Army of Ukraine as C...
PDF

Read the entirety of my Thesis that I provided, and use the Jyu IT faculty grading criteria to give an estimated grade.



JYU-Thesis-GPT

Based on the comprehensive analysis of your thesis against the JYU IT faculty grading criteria, it's clear that your work exhibits characteristics aligning with higher-grade criteria in several aspects. The exploration of the IT Army of Ukraine through the lens of Complex Adaptive Systems theory demonstrates a sophisticated and nuanced understanding of your subject matter, indicating a strong theoretical framework and innovative approach to cyberwarfare studies.

Your methodology, combining ethnographic case study with the principles of CAS, shows a well-thought-out research design and execution, aligning with criteria for higher-grade assessments in terms of methodological rigor and application.

The depth of your analysis, particularly in understanding the ITAU's operation within cyberwarfare and its implications, suggests a strong capability in critical thinking and synthesis, key for higher evaluation.

However, without access to the full structure, writing quality, and how well the thesis adheres to formal requirements and presentation standards, a precise grade cannot be determined. If your thesis maintains consistent quality throughout, with clear articulation, strong argumentation, and rigorous analysis, it could align with the higher end of the grading scale, potentially falling within the 4-5 range. This estimation assumes your work also excels in clarity, coherence, and scholarly contribution, as described in the grading criteria for top-tier submissions.



Share

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...but it was a
capability issue.



OpenAI Assistant to the rescue



Playground Assistants

JYU-Thesis-GPT

Name: JYU-Thesis-GPT

Instructions: You are a helpful MSc. Thesis Tutor of the University of Jyväskylä. You answer questions related to the MSc. Thesis content and structure. You are encouraging, but also critical when it comes to

Model: **gpt-4-1106-preview**

TOOLS

- Functions: Add
- Code interpreter: On
- Retrieval: On
- FILES: Add
 - Graduavrostelukriteerit_JYU_IT.pdf

Prompt

72090 tokens

User

Read the entirety of my Thesis that I provided, and use the Jyu IT faculty grading criteria to give an estimated grading.

Merilehto 2023 IT Army of Ukraine as Complex Adaptive System.pdf

Run instructions

You are a helpful MSc. Thesis Tutor of the University of Jyväskylä. You answer questions related to the MSc. Thesis content an...

JYU-Thesis-GPT

To provide an estimated grade for your thesis using the University of Jyväskylä IT faculty grading criteria, I will need to read through your thesis document thoroughly and evaluate it against the criteria. I will start by opening the document and then proceed to analyze its content. Please wait while I perform this task.

JYU-Thesis-GPT

The evaluation of your thesis based on the University of Jyväskylä IT faculty grading criteria consists of multiple dimensions, including:

A. The challenge and definition of the research problem B. The selection of sources and synthesis of literature C. The choice and application of research methods D. Presentation and response to the research questions E. Interpretation and discussion of results F. Linguistic correctness, polishing, and structural coherence

Each of these dimensions will be judged according to multiple levels of achievement, from insufficient (1) to excellent (5). To provide you with an estimated grading, I will need to critically examine each part of your thesis within these categories. Since these aspects run throughout the document, I will take time to evaluate your thesis comprehensively and provide feedback per category along with an overall estimated grade.

Please allow me some time to read through your thesis and conduct this evaluation.

Enter your message...

Run

Playground messages can be viewed by anyone at your organization using the API.

128,000 token
context window

OpenAI Assistant to the rescue



This is the refined output:

Section	Grade Range (1-5)	Comments
A. Research Problem Challenge & Definition	4	Problem is well-defined with clear challenge level outlined.
B. Selection of Sources & Synthesis	4	Comprehensive literature review and synthesis of sources.
C. Research Methods	4	Methodology is appropriate for the topic, and ethnographic case study approach seems thoroughly justified.
D. Presentation & Response to Research Qs	5	Clear, coherent, and systematic response to research questions within the structure of the thesis.
E. Interpretation and Discussion of Results	4	Your discussion of the IT Army as a complex adaptive system is insightful and adds new perspectives to the field.
F. Linguistic Correctness & Structural Coherence	4	Thesis is well-written and structured, with few if any linguistic errors noted.

This is the actual grading:

ARVOSTELU / EVALUATION	5	4	3	2	1
Aiheen vaativuus ja tutkimusongelman asettaminen <i>Degree of complexity of the topic and framing of the research</i>	X				
Lähteiden valinta, perehtyneisyys ja synteessin laatiminen <i>Choice of literature, familiarity with the topic and synthesis of the compilation</i>		X			
Tutkimusmenetelmän valinta ja soveltaminen <i>Choice of the research method and its application</i>		X			
Tulosten esittäminen ja tutkimuskysymyksiin vastaaminen <i>Presentation of the results and answering of the research questions</i>		X			
Tulosten tulkinta ja pohdinta <i>Interpretation and reasoning of the results</i>		X			
Kieliasu, viimeistely ja rakenteen johdonmukaisuus <i>Language, and quality of presentation and consistency of the structure</i>			X		

5 = erinomainen / Excellent
4 = kiitettävä / Very good
3 = hyvä / Good

2 = tyydyttävä / Satisfactory
1 = välttävä / Passable



Success!



Under 1 dollar of Token costs

Can be implemented via API in any website or application

...or just used via playground.



Case: BSc. in Nursing aka. fiancée

- Dyslexia & ADHD
- “*I have never read a book in my life.*”
- 0 % of classmates use AI

!<Error: Brain.exe has stopped working>





Case: BSc. in Nursing aka. fiancée



Explain this concept
X

Concept X is about...



*"This is the first time I get information
the way I actually can learn from it."*



Case: BSc. in Nursing aka. fiancée



*“It’s easy to just talk to **her***.”*

“Yeah, it does not know the official treatment recommendation very well.”

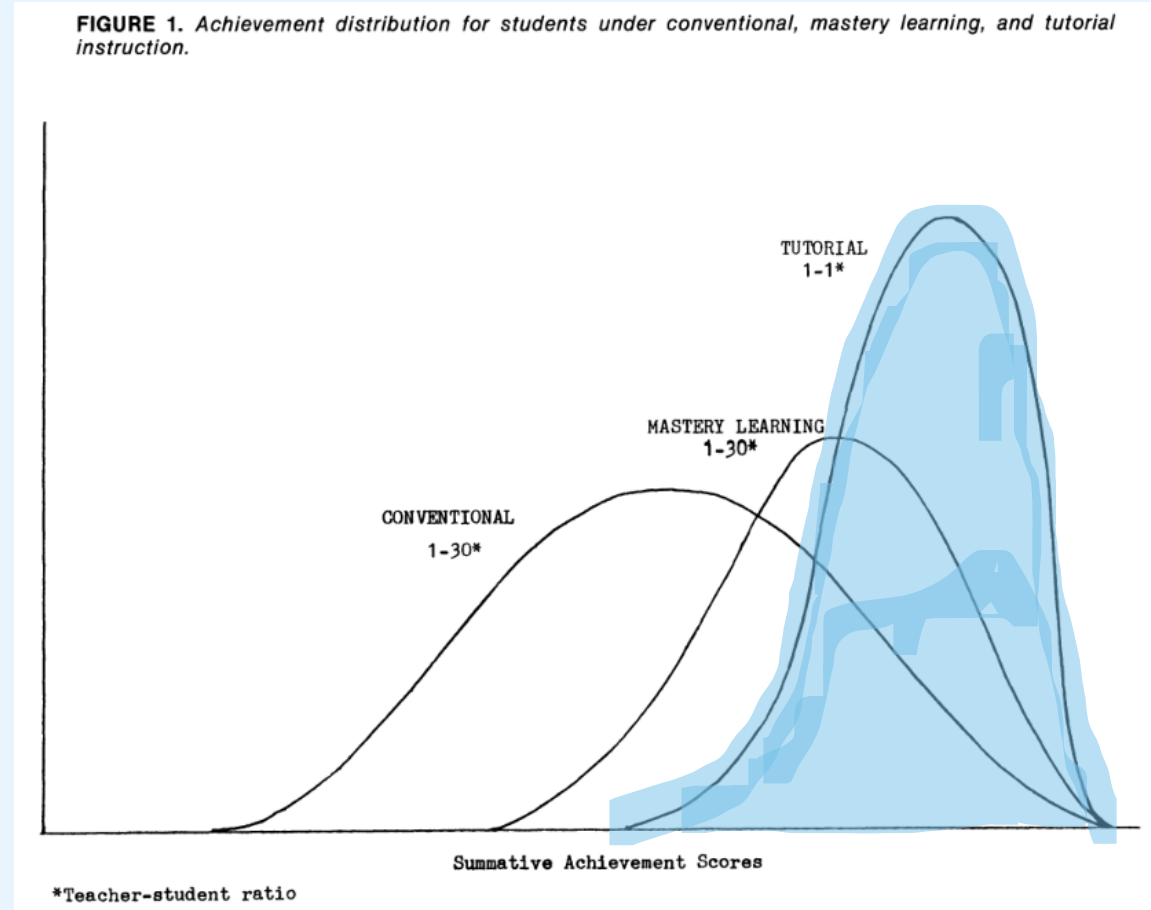
“I check from the books if she is right, which is much nicer than reading everything.”



* “Merja”



The 2 Sigma Problem: Solved?



Prompting for quizzes



You

I'm giving out a keynote about AI empowering students, give me three multiple-choice quiz questions.



ChatGPT

Here are three multiple-choice quiz questions related to the theme of AI empowering students:

1. **How does AI personalize learning for students?**
 - A) By providing a one-size-fits-all curriculum
 - B) By analyzing student performance to offer customized learning paths
 - C) By replacing teachers with robots
 - D) By making all students learn at the same pace
 - **Correct Answer:** B) By analyzing student performance to offer customized learning paths
2. **Which of the following is a benefit of integrating AI into education?**
 - A) Decreasing student engagement
 - B) Limiting access to learning materials
 - C) Enhancing the efficiency of administrative tasks
 - D) Reducing the variety of educational resources
 - **Correct Answer:** C) Enhancing the efficiency of administrative tasks
3. **How can AI support students with disabilities in the learning process?**
 - A) By restricting the formats of educational content
 - B) By creating barriers to communication
 - C) By offering adaptive learning technologies and accessible content
 - D) By ignoring individual learning needs
 - **Correct Answer:** C) By offering adaptive learning technologies and accessible content

These questions aim to test knowledge on the practical applications and benefits of AI in education, highlighting personalization, administrative efficiency, and support for students with disabilities.



Share



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Sparring partner

 You

Take the role of an academic professor in cognitive sciences. I'm here to apply for a Ph.D. position, and you are presenting me with interview questions about the theoretical concepts of Cognitive Science, that I will answer, and you will give me your review of the questions with corrections. Let's start the question-answers one by one. Keep the reviews and corrections short and concise.

 ChatGPT

Absolutely, let's begin with a fundamental question in the field of cognitive science.

Question 1: Can you explain the concept of "dual process theory" and give examples of how it applies to decision-making?

Share

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 You

Dual process theory provides an account of how thought can arise in two different ways, or as a result of two different processes. Often, the two processes consist of an implicit (automatic), unconscious process and an explicit (controlled), conscious process.

 ChatGPT

Your response succinctly captures the essence of dual process theory. You've correctly identified the distinction between implicit (automatic) and explicit (controlled) processes. For a more comprehensive understanding, it would be beneficial to include examples to illustrate these processes in action, such as the role of implicit processes in quick, gut-reaction decisions and explicit processes in more deliberative, reasoned decision-making. Incorporating examples helps demonstrate the theory's application in real-world scenarios, enhancing the depth of your explanation.

Feedback: Accurate description of dual process theory. To strengthen your answer, consider adding real-world examples that showcase the application of both processes in decision-making scenarios.

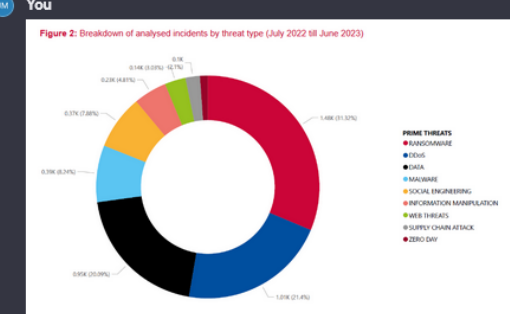
Let's move on to the next question.

Question 2: How does the concept of "working memory" differ from "short-term memory," and why is this distinction important in cognitive science?



Share

Save



Convert the data in this figure into a markdown table.

ChatGPT

To convert the data from the provided pie chart into a markdown table, I will transcribe the data points from the image into a table format. Here's how the data from the pie chart would look in a markdown table:

markdown Copy code

Threat Type	Incidents	Percentage
Ransomware	1.48K	31.32%
DDoS	1.01K	21.4%
Data	0.95K	20.09%
Malware	0.39K	8.24%
Social Engineering	0.37K	7.88%
Information Manipulation	0.23K	4.81%
Web Threats	0.14K	3.03%
Supply Chain Attack	0.09K	1.9%
Zero Day	0.1K	2.1%

Threat Type	Incidents	Percentage
Ransomware	1.48K	31.32%
DDoS	1.01K	21.4%
Data	0.95K	20.09%
Malware	0.39K	8.24%
Social Engineering	0.37K	7.88%
Information Manipulation	0.23K	4.81%
Web Threats	0.14K	3.03%
Supply Chain Attack	0.09K	1.9%
Zero Day	0.1K	2.1%

This table provides a textual representation of the data which can be useful for accessibility purposes, as well as for inclusion in text-based documents or platforms where pie charts may not be as easily represented or viewed.

You

Create a column diagram from this data:

Threat Type	Incidents	Percentage
Ransomware	1.48K	31.32%
DDoS	1.01K	21.4%
Data	0.95K	20.09%
Malware	0.39K	8.24%
Social Engineering	0.37K	7.88%
Information Manipulation	0.23K	4.81%
Web Threats	0.14K	3.03%
Supply Chain Attack	0.09K	1.9%
Zero Day	0.1K	2.1%

ChatGPT

Analyzing ▾

```
python Copy code

import matplotlib.pyplot as plt

# Data from the user's table
threat_types = ['Ransomware', 'DDoS', 'Data', 'Malware', 'Social Engine',
                'Information Manipulation', 'Web Threats', 'Supply Chai
incidents = [1.48, 1.01, 0.95, 0.39, 0.37, 0.23, 0.14, 0.09, 0.1] # in
percentages = [31.32, 21.4, 20.09, 8.24, 7.88, 4.81, 3.03, 1.9, 2.1] #

# Creating the column diagram
fig, ax1 = plt.subplots()

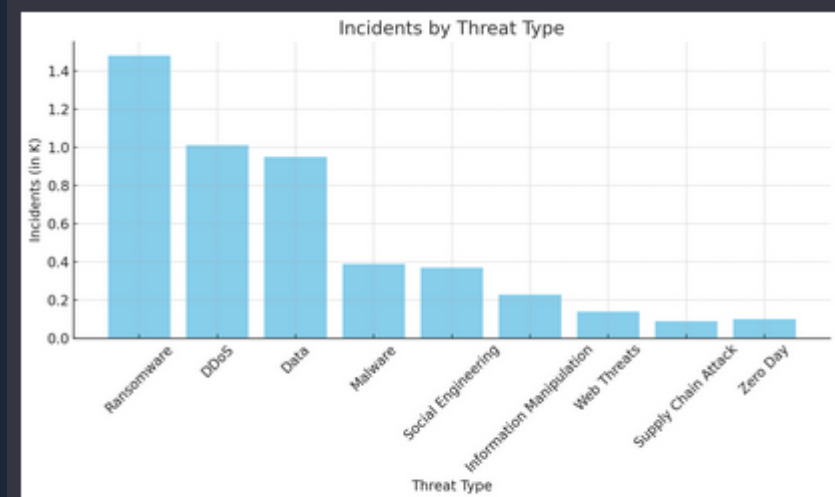
# Bar chart for incidents
color = 'tab:blue'
ax1.set_xlabel('Threat Type')
ax1.set_ylabel('Incidents (K)', color=color)
ax1.bar(threat_types, incidents, color=color)
ax1.tick_params(axis='y', labelcolor=color)
ax1.tick_params(axis='x', rotation=45, ha='right')

# Instantiate a second y-axis sharing the same x-axis
ax2 = ax1.twinx()

# Line chart for percentages
color = 'tab:red'
ax2.set_ylabel('Percentage (%)', color=color)
ax2.plot(threat_types, percentages, color=color, marker='o')
ax2.tick_params(axis='y', labelcolor=color)

# Title and layout
plt.title('Cybersecurity Threats: Incidents and Percentages')
fig.tight_layout()

# Show plot
```



Here is the column diagram based on the data you provided. It shows the number of incidents for each threat type in thousands (K). [-]



Midjourney Bot ✓ BOT Today at 15:12

1 a brown and white pit bull watching someone in the kitchen, in the style of shiny eyes, bold, black lines, stockphoto, havencore, ilford delta, thick texture, babycore --ar 3:4

2 a black and brown dog looking at the camera, in the style of dark indigo and white, [mike judge](#), [keos masons](#), sharp perspective angles, photo taken with provia, rounded, humanistic empathy --ar 3:4

3 an adoptable pitbull-terrier mix in sacramento, ca, in the style of dutch realism, dark violet and white, [damien hirst](#), shiny eyes, foreshortening techniques, strong sense of realism, [børge bredenbekk](#) --ar 3:4

4 a black white dog sitting on tile floor, in the style of light navy and dark brown, detailed facial features, photo taken with provia, stark honesty, heroic, bulbous, ilford sfx --ar 3:4



Message @Midjourney Bot





Quiz game for learning

AWS Fundamentals Quiz Ga...

Which AWS service allows you to run serverless code in response to events?

EC2

S3

Lambda

Elastic Beanstalk

Score: 1

Next

Answer

The correct answer is: Lambda

OK

aws_quiz.py

```
C:\Users\juhan> Sync > 1 Projects > VisualStudioCode > quiz_test > aws_quiz.py > ...  
1 import tkinter as tk  
2 from tkinter import messagebox  
3  
4 class AWSQuizGame(tk.Tk):  
5     def __init__(self, questions):  
6         super().__init__()  
7  
8     self.questions = questions  
9     self.current_question_index = 0  
10    self.score = 0  
  
f.title("AWS Fundamentals Quiz Game")  
f.question_label = tk.Label(self, text="", wraplength=300, font=...  
f.question_label.pack(pady=20)  
f.options_buttons = []  
for i in range(4):  
    btn = tk.Button(self, text="", command=lambda i=i: self.check
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

(base) PS C:\Users\juhan> & C:/Users/juhan/AppData/Local/Programs/Python/Python311/python.exe "c:/Users/juhan/Sync/1 Proj
ects/VisualStudioCode/quiz_test/aws_quiz.py"

Python 3.11.4 64-bit

AI USE	ROLE	PEDAGOGICAL BENEFIT	PEDAGOGICAL RISK
MENTOR	Providing feedback	Frequent feedback improves learning outcomes, even if all advice is not taken.	Not critically examining feedback, which may contain errors.
TUTOR	Direct instruction	Personalized direct instruction is very effective.	Uneven knowledge base of AI. Serious confabulation risks.
COACH	Prompt metacognition	Opportunities for reflection and regulation, which improve learning outcomes.	Tone or style of coaching may not match student. Risks of incorrect advice.
TEAMMATE	Increase team performance	Provide alternate viewpoints, help learning teams function better.	Confabulation and errors. “Personality” conflicts with other team members.
STUDENT	Receive explanations	Teaching others is a powerful learning technique.	Confabulation and argumentation may derail the benefits of teaching.
SIMULATOR	Deliberate practice	Practicing and applying knowledge aids transfer.	Inappropriate fidelity.
TOOL	Accomplish tasks	Helps students accomplish more within the same time frame.	Outsourcing thinking rather than work.



Outsourcing thinking, rather than work.

“Students tended to rely on AI assistance rather than actively learning from it.”

Darvishi et al. 2024



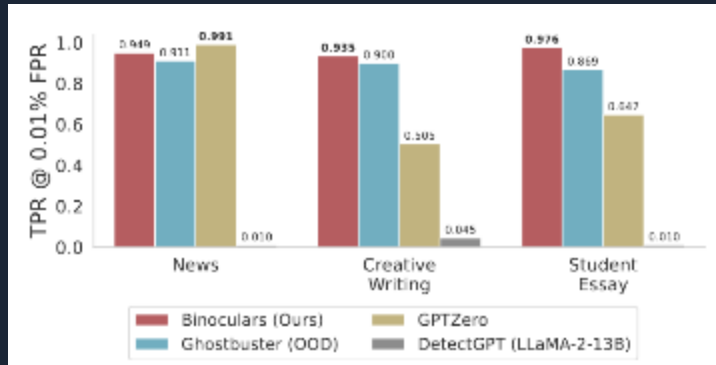


Outsourcing thinking: cheating and ‘plagiarism’

Can we detect AI written texts?

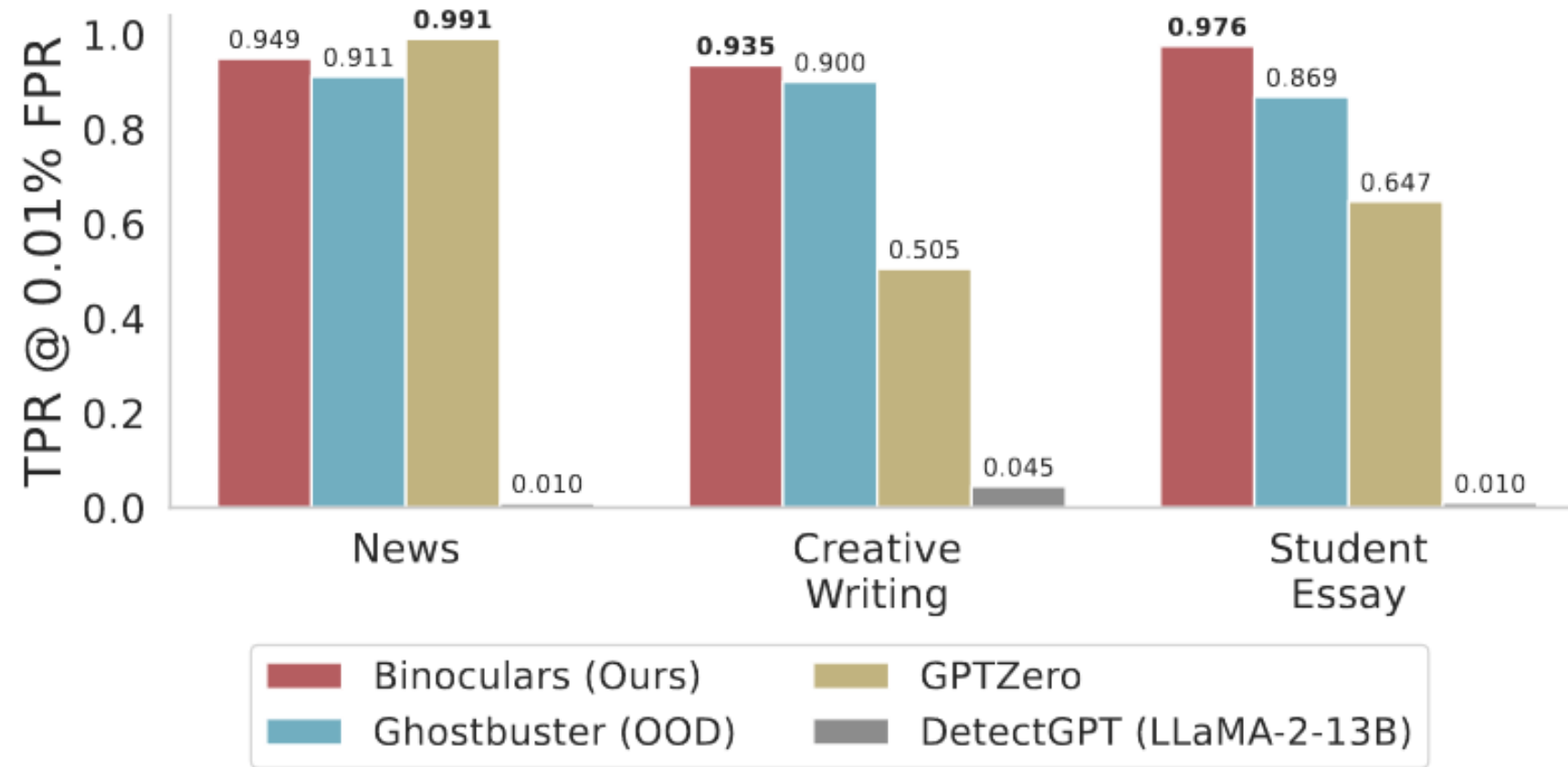


“Our AI Writing detector’s false positive rate is less than 1% for documents with 20% or more AI writing.” Turnitin, 2024



What about Student text that AI has modified?

What about AI text that the Student has modified?



“Binoculars detects over 90% of generated samples from ChatGPT” p.1

“...we do not consider explicit efforts to bypass detection.” p.11



Not highlighted as AI created?

- AI:
 - Idea
 - Structure
 - Content
 - Sources
 - Motivation
 - Self-reflection

- Student:
 - Writes it

Highlighted as AI created?

- AI:
 - Writes it

- Student:
 - Idea
 - Structure
 - Content
 - Sources
 - Motivation
 - Self-reflection



Detection: what to do?

- AI detection is “AI or Human” thinking
- Go towards “AI + Human” thinking
- “Did you use AI” vs. “*How* did you use AI”?





Worry: Copyrights

Can we use Generative AI without worrying about getting sued?

The New York Times

The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work

Millions of articles from The New York Times were used to train chatbots that now compete with it, the lawsuit said.

Share full article



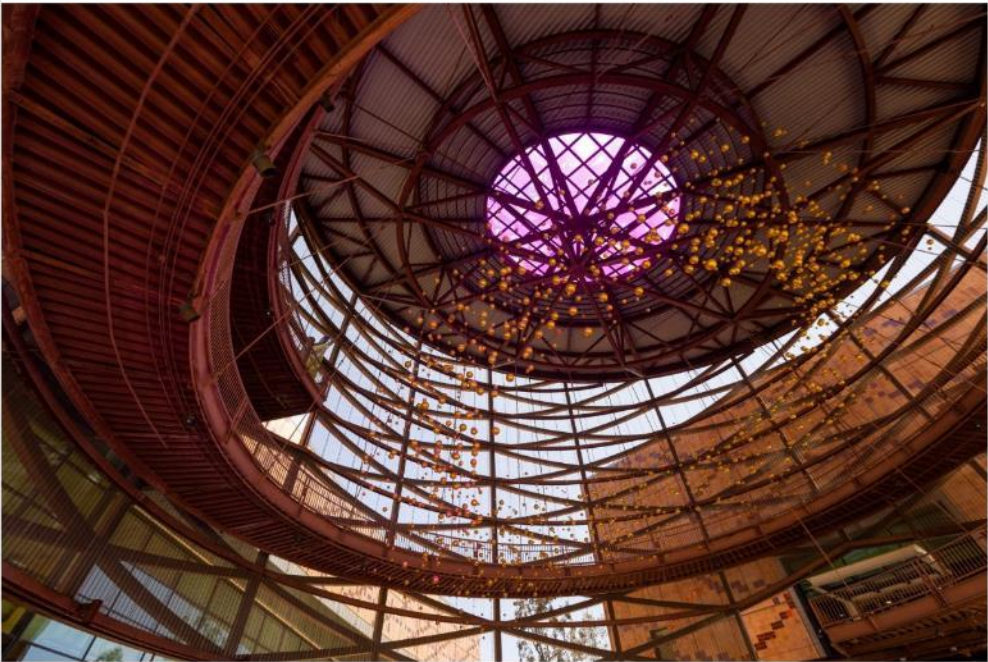
1.3K



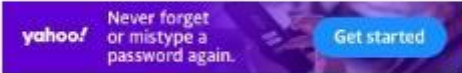
A lawsuit by The New York Times could test the emerging legal contours of generative A.I. technologies. Sasha Maslov for The New York Times.

Microsoft announces new Copilot Copyright Commitment for customers

Sep 7, 2023 | Brad Smith, Vice Chair and President, Hossein Nowbar, CVP and Chief Legal Officer



Microsoft’s AI-powered Copilots are changing the way we work, making customers more efficient while unlocking new levels of creativity. While these transformative tools open doors to new possibilities

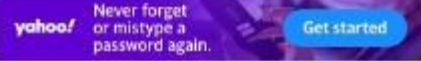


OpenAI promises to defend business customers against copyright claims

Kyle Wiggers

@kyle_wiggers / 10:15 am PST • November 6, 2023

The fight is not with the users, its between *others* and tech companies.



Adobe indemnity clause designed to ease enterprise fears about AI-generated art

Ron Miller

@ron_miller / 3:13 am PDT • June 20, 2023





The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work

Millions of articles from The New York Times were used to train chatbots that now compete with it, the lawsuit said.

Share full article



A lawsuit by The New York Times could test the emerging legal contours of generative A.I. technologies. [Audio Slides for The New York Times](#)



How can one empower students to success?



Create Generative
AI Policy



Teach students
how to use GenAI



Enable & Integrate
into learning





How can one empower students to success?



Create Generative
AI Policy



Policy creates a framework for students to know what is allowed to do, and that they can trust the process.



Teach students
how to use GenAI



Compulsory GenAI course. Priority towards culture of inclusion and bold testing, testing, testing.



Enable & Integrate
into learning



Assume that AI will be used by students on all assignments; reverse the playground and integrate it into the study-activity.



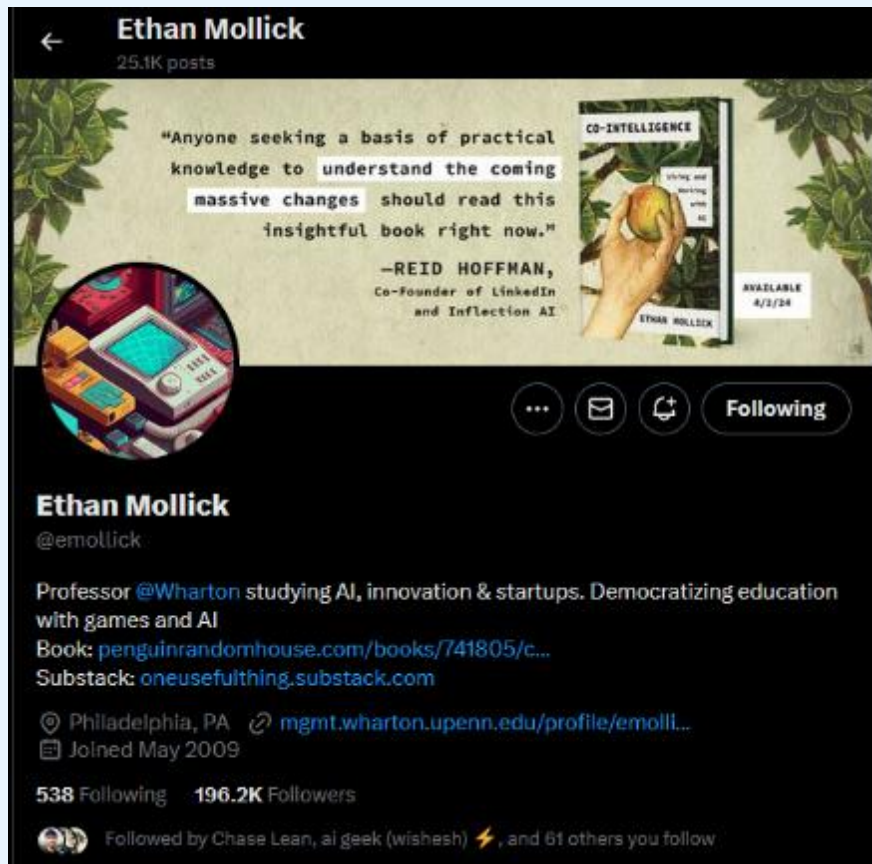
Materials – and thank you at this point





Who to follow and where can you learn more - fast

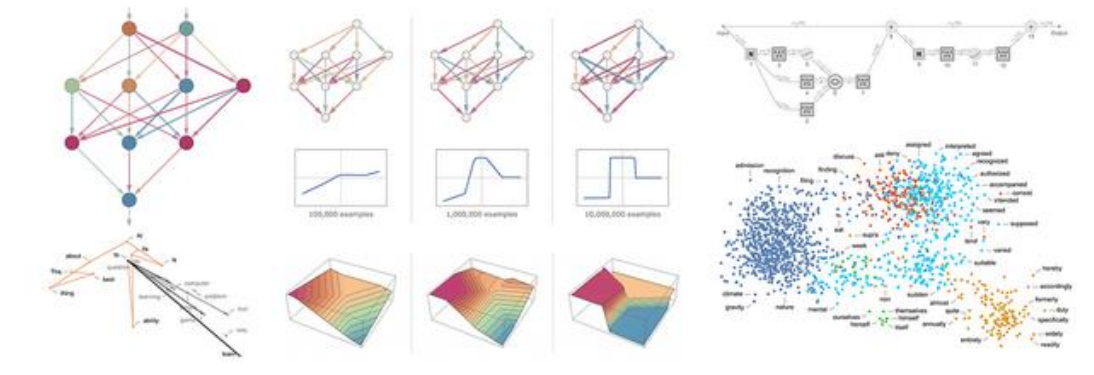
<https://twitter.com/emollick>



<https://writings.stephenwolfram.com/2023/02/what-is-chatgpt-doing-and-why-does-it-work/>

What Is ChatGPT Doing ... and Why Does It Work?

February 14, 2023





Practical AI for Instructors and Students Part 1: Introduction to AI for Teachers and Students
74K views • 6 months ago
Wharton School

In this introduction, Wharton Interactive's Faculty Director Ethan Mollick and Director of Pedagogy Lilach Mollick provide an ...

"Attention is All You Need" | "What is ChatGPT Doing and Why Does it Work" | "Performance of..." 4 moments

Practical AI for Instructors and Students by Ethan and Lilach Mollick
Jonathan McMichael · Playlist

Practical AI for Instructors and Students Part 1: Introduction to AI for Teachers and Students • 10:17
Practical AI for Instructors and Students Part 2: Large Language Models (LLMs) • 12:41
VIEW FULL PLAYLIST

Practical AI for Instructors and Students Part 4: AI for Teachers
18K Views • 6 months ago
Wharton School

In this video, Wharton Interactive's Faculty Director Ethan Mollick and Director of Pedagogy Lilach Mollick discuss how to use AI to ...

For this prompt, use either OpenAI's ChatGPT4 or Microsoft's Bing in Creative | For this prompt, use... 3 moments

Practical AI for Instructors and Students Part 2: Large Language Models (LLMs)
23K Views • 6 months ago
Wharton School

In this video, Wharton Interactive's Faculty Director Ethan Mollick and Director of Pedagogy Lilach Mollick do a deep dive into a ...

Introduction | Core foundational models | Other models | Models | Bing | Downside 6 chapters

Practical AI for Instructors and Students Part 3: Prompting AI
22K views • 6 months ago
Wharton School

In this video, Wharton Interactive's Faculty Director Ethan Mollick and Director of Pedagogy Lilach Mollick discuss how to ...

Introduction | What to remember | Caveats | Creating a Prompt | Using Bing | Interactive Prompts 6 chapters

Practical AI for Instructors and Students Part 5: AI for Students
17K views • 6 months ago
Wharton School

In this module, we discuss how students can use AI to improve their learning and include guidelines and tips for getting the most ...

YouTube 5-part series by Mollick & Mollick – Wharton School

<https://www.youtube.com/watch?v=t9gmyvf7JYo>



Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies, Including Prompts

Dr. Ethan Mollick Dr. Litch Mollick

Wharton School of the University of Pennsylvania & Wharton Interactive

March 16, 2023

Abstract: This paper provides guidance for using AI to quickly and easily implement evidence-based teaching strategies that instructors can integrate into their teaching. We discuss five teaching strategies that have proven value but are hard to implement in practice due to time and effort constraints. We show how AI can help instructors create material that supports these strategies and improve student learning. The strategies include providing multiple examples and explanations; uncovering and addressing student misconceptions; frequent low-stakes testing; assessing student learning; and distributed practice. The paper provides guidelines for how AI can support each strategy, and discusses both the promises and perils of this approach, arguing that AI may act as a "force multiplier" for instructors if implemented cautiously and thoughtfully in service of evidence-based teaching practices.

Electronic copy available at: <https://arxiv.org/abs/2306.10052>

Mollick, E. R., & Mollick, L. (2023). Using AI to implement effective teaching strategies in classrooms: Five strategies, including prompts. *Including Prompts* (March 17, 2023).

ASSIGNING AI: SEVEN APPROACHES FOR STUDENTS WITH PROMPTS

Dr. Ethan Mollick Dr. Litch Mollick

Wharton School of the University of Pennsylvania & Wharton Interactive

June 11, 2023

Abstract:

This paper examines the transformative role of Large Language Models (LLMs) in education and their potential as learning tools, despite their inherent risks and limitations. The authors propose seven approaches for utilizing AI in classrooms: AI-tutor, AI-coach, AI-mentor, AI-teammate, AI-tool, AI-simulator, and AI-student, each with distinct pedagogical benefits and risks. The aim is to help students learn with and about AI, with practical strategies designed to mitigate risks such as complacency about the AI's output, errors, and biases. These strategies promote active oversight, critical assessment of AI outputs, and complementation of AI's capabilities with the students' unique insights. By challenging students to remain the "human in the loop", the authors aim to enhance learning outcomes while ensuring that AI serves as a supportive tool rather than a replacement. The proposed framework offers a guide for educators navigating the integration of AI-assisted learning in classrooms.

1

Mollick, E., & Mollick, L. (2023). Assigning AI: Seven Approaches for Students, with Prompts. *arXiv preprint arXiv:2306.10052*.



#Principle	Prompt Principle for Instructions
1	No need to be polite with LLM so there is no need to add phrases like “please”, “if you don’t mind”, “thank you”, “I would like to”, etc., and get straight to the point.
2	Integrate the intended audience in the prompt, e.g., the audience is an expert in the field.
3	Break down complex tasks into a sequence of simpler prompts in an interactive conversation.
4	Employ affirmative directives such as ‘do,’ while steering clear of negative language like ‘don’t’.
5	When you need clarity or a deeper understanding of a topic, idea, or any piece of information, utilize the following prompts: - o Explain [insert specific topic] in simple terms. - o Explain to me like I’m 11 years old. - o Explain to me as if I’m a beginner in [field]. - o Write the [essay/text/paragraph] using simple English like you’re explaining something to a 5-year-old.
6	Add “I’m going to tip \$xxx for a better solution!”
7	Implement example-driven prompting (Use few-shot prompting).
8	When formatting your prompt, start with ‘###Instruction###’, followed by either ‘###Example###’ or ‘###Question###’ if relevant. Subsequently, present your content. Use one or more line breaks to separate instructions, examples, questions, context, and input data.
9	Incorporate the following phrases: “Your task is” and “You MUST”.
10	Incorporate the following phrases: “You will be penalized”.
11	use the phrase ”Answer a question given in a natural, human-like manner” in your prompts.
12	Use leading words like writing “think step by step”.
13	Add to your prompt the following phrase “Ensure that your answer is unbiased and does not rely on stereotypes”.
14	Allow the model to elicit precise details and requirements from you by asking you questions until he has enough information to provide the needed output (for example, “From now on, I would like you to ask me questions to...”).
15	To inquire about a specific topic or idea or any information and you want to test your understanding, you can use the following phrase: “Teach me the [Any theorem/topic/rule name] and include a test at the end, but don’t give me the answers and then tell me if I got the answer right when I respond”.
16	Assign a role to the large language models.
17	Use Delimiters.
18	Repeat a specific word or phrase multiple times within a prompt.
19	Combine Chain-of-thought (CoT) with few-Shot prompts.
20	Use output primers, which involve concluding your prompt with the beginning of the desired output. Utilize output primers by ending your prompt with the start of the anticipated response.
21	To write an essay /text /paragraph /article or any type of text that should be detailed: “Write a detailed [essay/text /paragraph] for me on [topic] in detail by adding all the information necessary”.
22	To correct/change specific text without changing its style: “Try to revise every paragraph sent by users. You should only improve the user’s grammar and vocabulary and make sure it sounds natural. You should not change the writing style, such as making a formal paragraph casual”.
23	When you have a complex coding prompt that may be in different files: “From now on and whenever you generate code that spans more than one file, generate a [programming language] script that can be run to automatically create the specified files or make changes to existing files to insert the generated code. [your question]”.
24	When you want to initiate or continue a text using specific words, phrases, or sentences, utilize the following prompt: o I’m providing you with the beginning [song lyrics/story/paragraph/essay...]: [Insert lyrics/words/sentence]’. Finish it based on the words provided. Keep the flow consistent.
25	Clearly state the requirements that the model must follow in order to produce content, in the form of the keywords, regulations, hint, or instructions
26	To write any text, such as an essay or paragraph, that is intended to be similar to a provided sample, include the following instructions: o Please use the same language based on the provided paragraph/title/text /essay/answer].

Table 1: Overview of 26 prompt principles. Bsharat et al. 2023.

Very good fast checklist for successful prompting.

Remember: Prompting is an iterative method, test!

References



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