# Open Science in the Times of AI:

## The Evolution of Scholarly Communication and Academic Research

FIRST WINTER SCHOOL 2025
Bankya
04-07 February 2025

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Science and Research Institute, UE - Varna

A

https://bit.ly/phdwinter

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## Who am I, what I do [today]…

My professional interests:

- AI literacy, AI in Teaching and Learning,
- Immersive Teaching and Learning,
- Social Media in Education,
- Multimedia and Interactivity in Education,
- Scholarly Communication and Research

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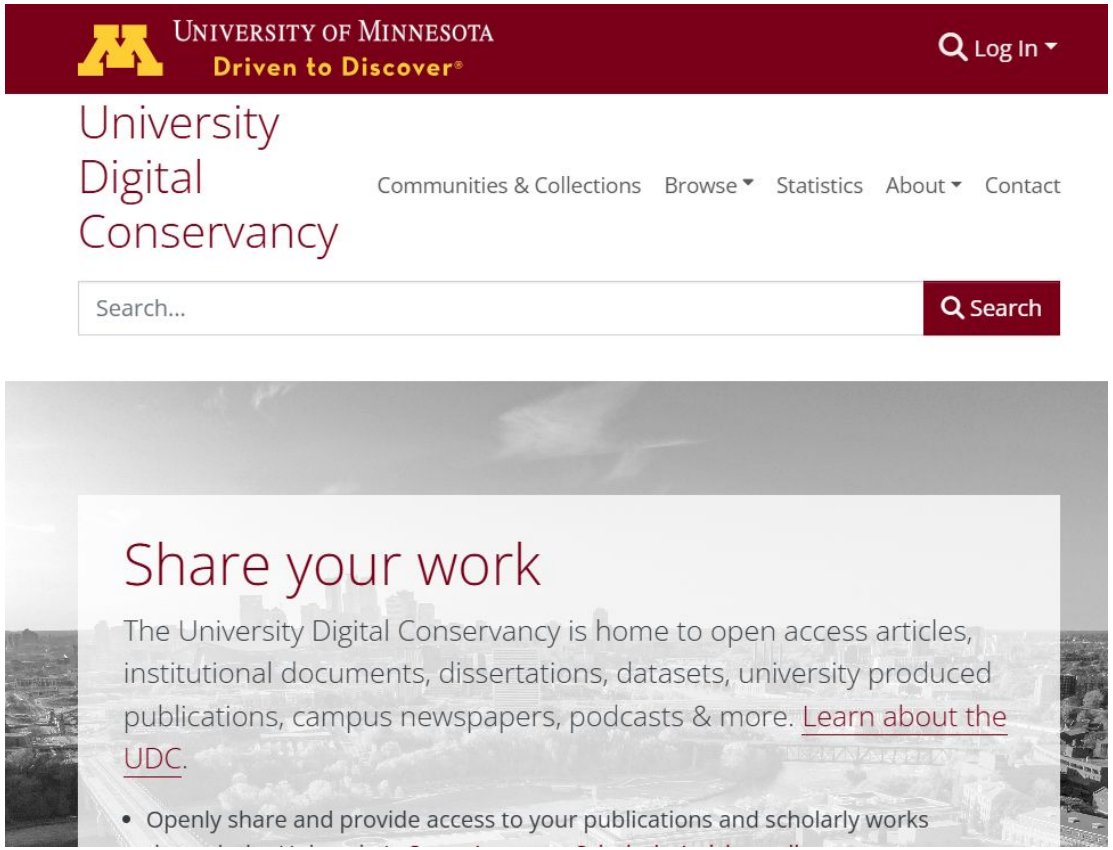
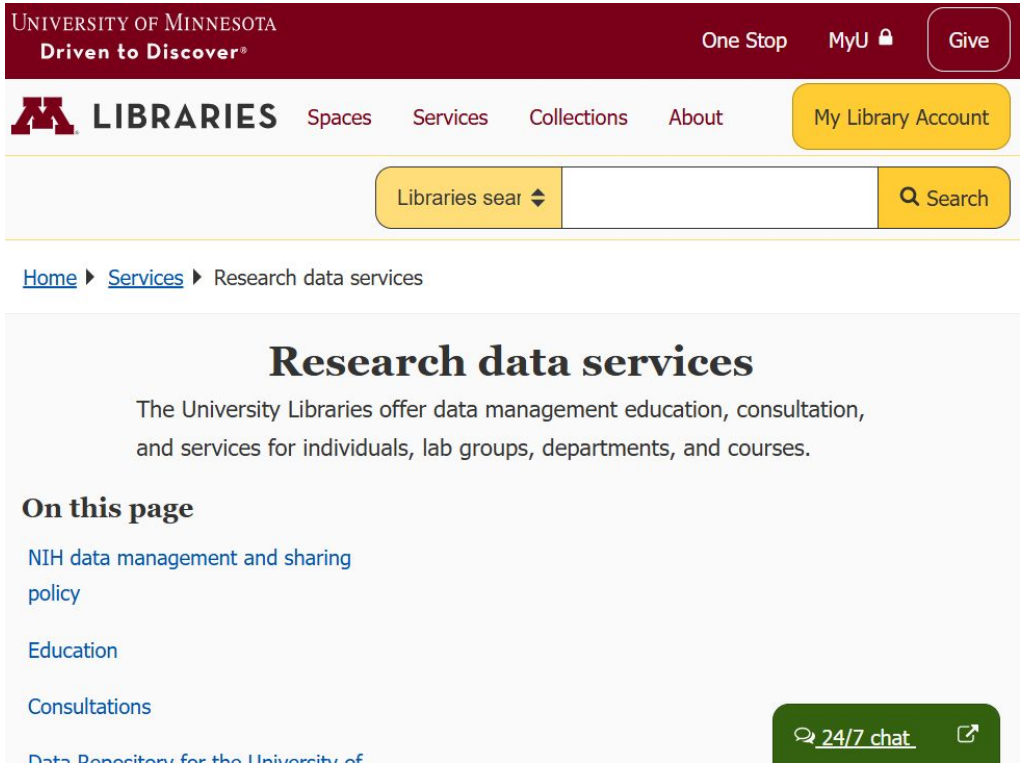
# REINFORCING



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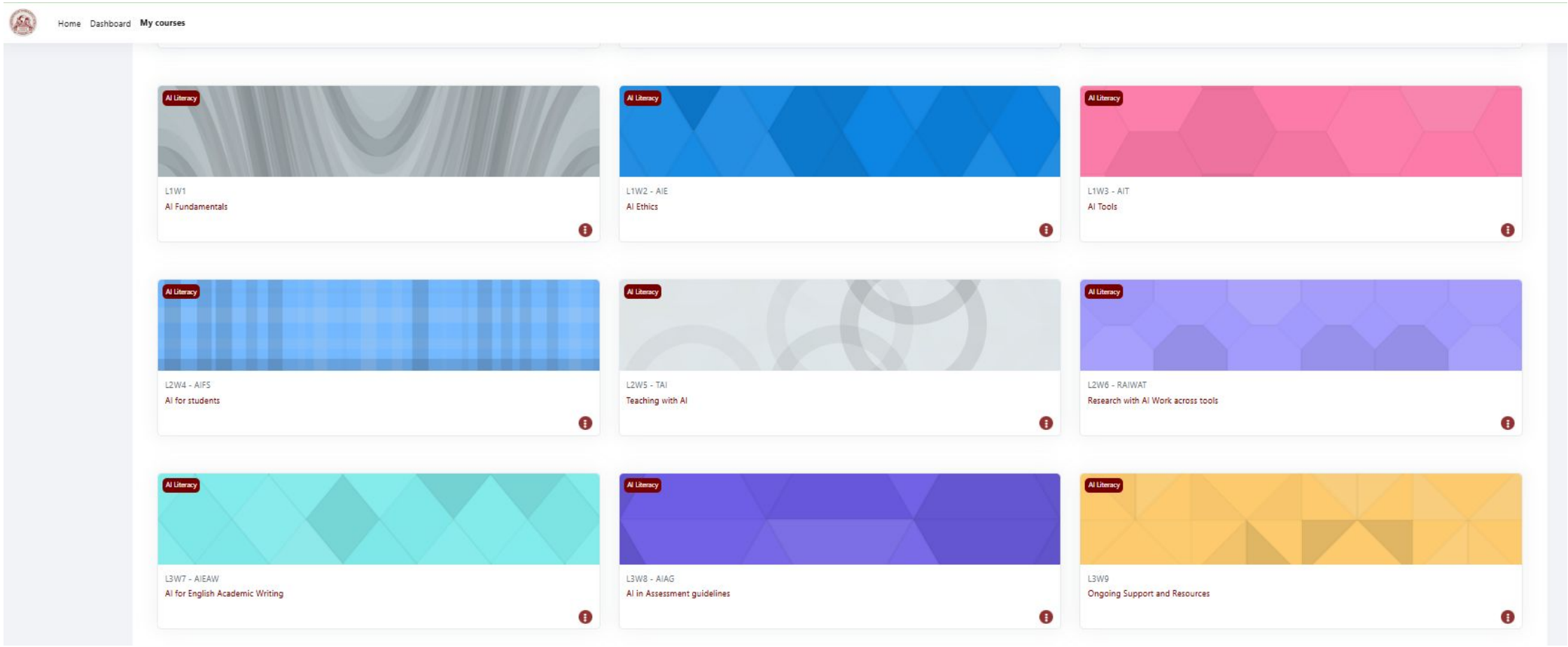
# AI Literacy at UE - Varna



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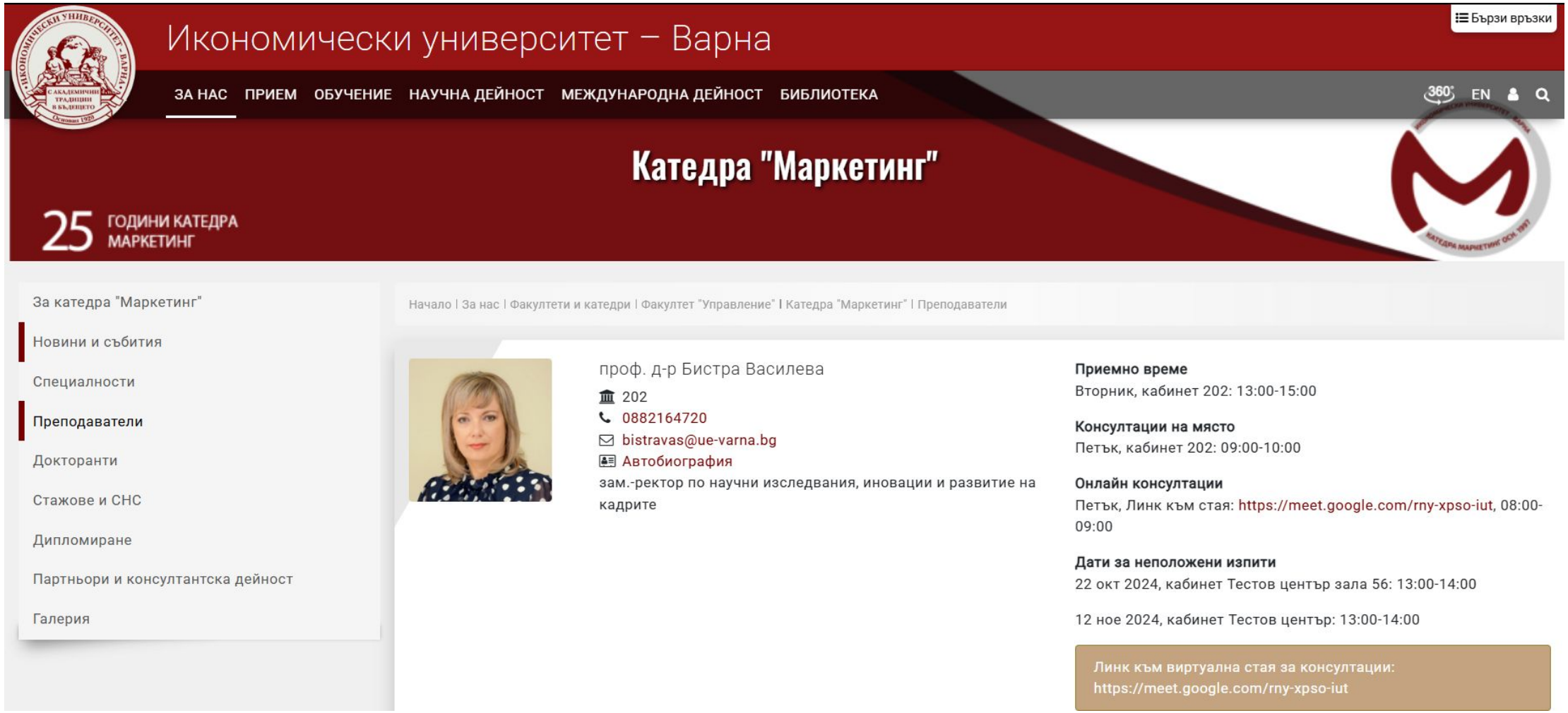
# Contact AI Doctoral Program at UE - Varna



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## Please take this short survey

Link to the survey

https://bit.ly/bgdoctoral

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# Open Access and Predatory Journals

El País English Edition
18h ·

A shady business network apparently run from a mansion on the outskirts of Birmingham is buying up long-standing scientific journals and converting them into fast-money machines by increasing the price they charge researchers for publishing, with little regard for quality

ENGLISH.ELPAIS.COM

**A shady business operated out of a British mansion is buying up scientific journals to earn millions by publishing mediocre studies**

[Libguides on Predatory Journals]

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**sahibzada mayed (صاحبزاده مائد)** • 3rd+
Abolitionist by Design // Decolonial Researcher // Fashionista g...
13h •

+ Follow ···

Research isn't neutral—it either upholds hierarchies of power or disrupts them.

We are often conditioned to believe that research is an objective pursuit of knowledge when in reality every aspect from whose voices are centered to how resources are distributed is political.

The illusion of objectivity and neutrality can be incredibly harmful because it serves as a scapegoat to avoid accountability and reinforce the status quo.

Research can be a tool for meaningful social change and transformation if it actively resists extraction and disrupts how power is concentrated, challenging the very systems that have turned knowledge into a commodity.

If you're ready to reimagine research as a practice of care and reciprocity, join us for our upcoming 5-week cohort in April. Details shared below 👇🏽

bit.ly/Reimagining-Research

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# The Role of the Scholarly Communication Librarian

- Over the past two decades, the role of the scholarly communication librarian has evolved from managing copyright and repositories to driving open access (OA) initiatives.
- Initially focused on authors' rights and alternative publishing, the position expanded with the OA movement to include negotiating agreements, managing open data, and promoting open educational resources.
- Variations in scope depend on institutional priorities, with research-intensive universities leading comprehensive OA efforts.
- The COVID-19 pandemic highlighted the critical importance of this role in ensuring equitable access to knowledge, solidifying its place as essential in advancing academic dissemination.

read more about Scholarly Communication Librarian responsibilities here >>>

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## Frameworks Re Scholarly Communications

- **Budapest Open Access Initiative (2002)**
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003)
- Bethesda Statement on Open Access Publishing (2003)
- Panton Principles for Open Data in Science (2010)
- Global Open Access Portal (GOAP) by UNESCO (2011)
- **San Francisco Declaration on Research Assessment (DORA) (2012)**
- Open Data Charter (2015)
- The Hague Declaration on Knowledge Discovery in the Digital Age (2015)
- **FAIR Principles (2016)**
- Plan S (2018)
- Open Science Agenda by UNESCO (2021)

more details here >>>

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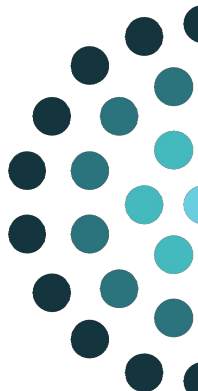
# Similarities and Differences in AI's Impact on Scholarly Communication in the USA and the EU

- The Equivalent of the 'Open Science' Structure in the USA
- The Impact of Generative AI on Academic Research in the USA and EU
- The Role of Private Companies in AI and Academic Research



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## The Equivalent of the 'Open Science' Structure in the USA

- The European Union's "Open Science" initiative aims to make scientific research more accessible and collaborative, promoting open-access publications, data sharing, and transparency.
- In the United States, while there isn't a direct equivalent under a unified banner like "Open Science," similar principles are promoted through various policies and institutions

read more here >>>

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# The Impact of Generative AI on Academic Research in the USA and EU

- GenAI is transforming academic research in both the US and EU by accelerating tasks like literature reviews, data analysis, and drafting.
- Both regions face similar challenges, including ethical concerns around bias, plagiarism, and credibility, as well as the need for AI literacy among researchers.
- However, the EU emphasizes strict regulations, ethical use, and alignment with societal values through frameworks like the AI Act, while the USA takes a more innovation-focused and decentralized approach, often driven by private-sector partnerships.
- These differences reflect broader cultural and policy priorities, shaping the integration of GenAI into academic workflows. read more here >>>

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## Role of Private Companies in AI and Academic Research

Private companies play a pivotal role in advancing AI in academic research, with distinct approaches in the USA and EU.

In the U.S., tech giants like Google, OpenAI, and Microsoft drive innovation through university partnerships, cloud infrastructure, and commercialization of AI tools, focusing on rapid adoption.

EU companies collaborate within regulated frameworks like Horizon Europe, emphasizing ethical AI use and societal benefits, though stricter regulations like GDPR can slow progress. please read more here >>>

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## AI and Academic Research

The AI application [at Yale Library] deploys AI-powered Large Language Models (LLMs) to rapidly “read,” summarize, and analyze digital texts—transcribed with Optical Character Recognition (OCR)—and then answer a set of questions about the content. LLMs are designed to mimic the human brain’s way of recognizing, interpreting, and learning from language patterns, but at exponentially higher rates of speed than a person can ( Yale Library, 2024).

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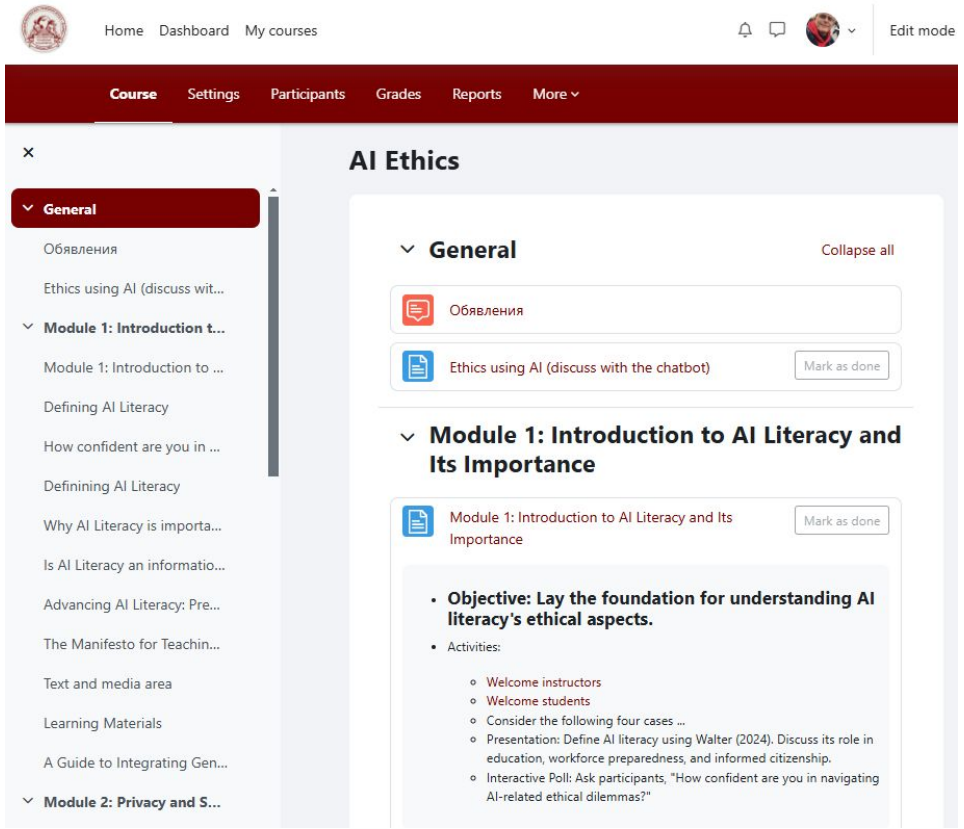
# AI Literacy

- Ethics
- Legal issues
- Copyright and Fair Use
- Plagiarism
- Privacy and Security
- Environmental issues
- Human-Centered AI
- Misinformation and Disinformation
- Data Literacy



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# AI Literacy

1. Technical Knowledge
2. Ethical Awareness
3. Critical Thinking
4. Practical Skills
5. Societal Impact

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# AI for Peer Review and Plagiarism Detection

https://elicit.com/
Features: AI-powered literature search and summarization for peer review.
Best For: Finding relevant papers, comparing studies, and generating research insights.
Limitations: Not a direct peer-review tool but aids in critical analysis.

https://plagiarismdetector.net/
Features: Checks for duplicate content and compares with online sources.
Best For: Quick plagiarism detection for short texts.
Limitations: Free checks are limited to 1,000 words per search.

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## AI in Experiment Design and Simulation

AlphaFold by DeepMind

*What it does*:

Predicts 3D protein structures using AI, aiding in drug discovery and understanding molecular interactions.

*Impact*:

Accelerates hypothesis generation and experimental design by simulating outcomes with high accuracy.

*Relevance*:

Opens new research possibilities in fields like biochemistry, molecular biology, and pharmaceutical sciences.

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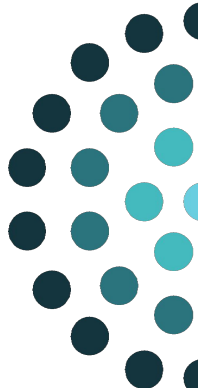
# AI Tools for Social Science

- AI Tools for Literature Review & Research Discovery
- AI Tools for Writing & Language Enhancement
- AI Tools for Data Collection & Survey Analysis
- AI Tools for Data Analysis & Statistical Computing
- AI Tools for Transcription & Qualitative Research
- AI Tools for Research Collaboration & Productivity

more info in Notes



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## AI for Academic Writing Assistance

Grammarly and Writefull

*What it does*:

Provides real-time feedback on grammar, style, clarity, and academic phrasing tailored for research manuscripts.

*Impact*:

Helps researchers produce polished, publication-ready articles by refining language and structure.

*Relevance*:

Supports non-native English speakers and doctoral students working on their theses or journal submissions.

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# AI in Research Data Analysis

IBM Watson for Genomics

*What it does*:

Uses AI to analyze genomic data, identify mutations, and suggest potential therapeutic pathways.

*Impact*:

Enables faster processing and interpretation of complex datasets, reducing manual effort and enhancing precision.

*Relevance*:

Particularly valuable for life sciences and health-related doctoral research with large datasets.

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# AI-Powered Literature Review and Discovery

Semantic Scholar

*What it does*:

AI algorithms analyze and summarize vast volumes of scholarly literature, identifying key papers, trends, and influential citations.

*Impact*:

Speeds up the literature review process, highlights connections across disciplines, and offers features like citation graphs and key phrase extractions.

*Relevance*:

Helps doctoral students and researchers stay up-to-date with relevant research efficiently.

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## AI Enhanced Search Engines

ResearchRabbit

*What it does*:

Allows users to create collections of academic papers and receive recommendations for related works.

Uses machine learning to suggest relevant studies, track research trends, and visualize connections between papers, authors, and topics.

*Impact*:

Streamlines the discovery of new and relevant research by offering personalized suggestions based on user-curated collections.

Enables real-time updates on new publications in specific areas of interest.

*Relevance*:

Ideal for doctoral students seeking a dynamic way to organize their literature review and stay updated on emerging research.

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## Dimensions

*What it does*:
Combines AI with a vast database of publications, datasets, and patents, linking them to funding sources and citations.
Offers contextualized search results based on keywords and relationships across research outputs.
*Impact*:
Facilitates a comprehensive understanding of the research ecosystem, including funding trends and collaboration opportunities.
Helps researchers identify influential studies and potential collaborators.
*Relevance*:
Ideal for doctoral students interested in understanding the broader impact of their field or identifying grant opportunities.

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## Scite.ai

*What it does*:
Highlights the influence and reception of research papers.
*Impact*:
Valuable for doctoral students seeking to understand how specific research has been received and its role in advancing the field.
*Relevance*:
Valuable for doctoral students seeking to understand how specific research has been received and its role in advancing the field.

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## Quo Vadis, Clarivate…

"In September, we acquired Alethea,6 an AI-powered students' content engagement platform created by Pangea. Alethea facilitates meaningful engagement with academic texts, class readings, and assignments through **personalized and adaptive guidance**. Faculty and librarians gain the insights they need to **analyze students' reading engagement** and rapidly adapt their teaching. By incubating new technology and startups like Alethea, we intend to **improve learning outcomes, enhance student's content engagement and grow library content usage.**" (The Impact of Generative... 2023)

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## How Does DeepSeek vs. ChatGPT?

- DeepSeek uses fewer computational resources during training and usage by utilizing techniques like inference-time computing while activating only the most relevant parts of the model for each task.
- While ChatGPT excels at general-purpose tasks, like writing essays and having casual conversations, DeepSeek specializes in reasoning capabilities, excelling in areas like solving math problems, tackling coding challenges, and handling logical reasoning tasks.
- DeepSeek uses distillation techniques to create smaller, efficient versions of its model that still retain strong reasoning capabilities. This makes it more adaptable for low-resource settings with limited computing power, like schools with limited tech budgets.

# DeepSeek Issues

DeepSeek AI fails almost all safety tests and often hallucinates. So it's now becoming clear that many of the company's efficiency shortcuts result in a system that's less trusted. Things like using 8-bit integers, not training the entire model, etc. just don't create the robustness of a more complete LLM. I'm really excited about some of the new algorithms here, but if the model isn't trusted then it's almost of no use at all. Let's see how this plays out.

https://www.linkedin.com/posts/bersin_deepseeks-safety-guardrails-failed-every-activity-7291629991572779009-vg-b/

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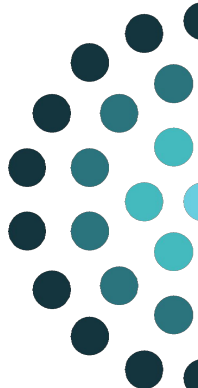
## DeepSearch announced by OpenAI

Internet search plus reasoning
https://www.linkedin.com/feed/update/urn:li:activity:7292018053029003264/
.

OpenAI's deep research is very good. Unlike Google's version, which is mostly a good summarizer of many sources, OpenAI is more like engaging an opinionated (often almost PhD-level!) researcher who follows lead.
https://www.linkedin.com/posts/emollick_openais-deep-research-is-very-good-unlike-ugcPost-7291972290425044992-Nb7-/



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## January 28, 2025: Ethan Mollick

- "1. three good choices right now: Claude from Anthropic, Google's Gemini, and OpenAI's ChatGPT.
- 2. There are also a trio of models that might make sense for specialized users: Grok by Elon Musk's X.ai is an excellent model that is most useful if you are a big X user;
- 3. Microsoft's Copilot offers many of the features of ChatGPT and is accessible to users through Windows; and the new DeepSeek, a Chinese model that is remarkably capable (and free)."

Want to know more about it? Here is the link

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## January 7, 2025: Chris Goodall

- Gemini 1.5 Pro with Deep Research tool researched and used 24 articles/papers/websites
- Stanford Storm researched and used 20 articles/papers/websites
- Corpora researched and used 179 articles/papers/websites

Want to know more 'bout it? Here is the link

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## Which tool to choose?

With new AI tools emerging daily, researchers need to stay adaptable, continuously testing and evaluating tools to identify those that best meet their current needs.
The fast-paced development of AI means that yesterday's solutions may be surpassed by more efficient or innovative options, making it essential to remain informed and open to change.

please read more about AI tools here

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# Hands-on Exercises with AI-powered Open Science Tools

- Life Sciences & Biomedical Research
- Social Sciences & Behavioral Research
- Humanities & Digital Scholarship
- Cross-Disciplinary Exercise: Open Science AI Challenge

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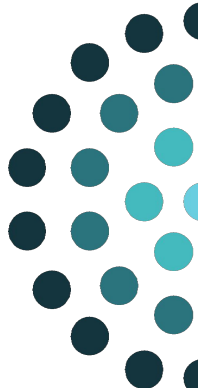
## Different Types of Prompting

1. Zero-Shot Prompting
2. One-Shot Prompting
3. Few-Shot Prompting
4. Chain-of-Thought Prompting
5. Negative Prompting
6. Instruction Prompting
7. Multimodal Prompting
8. Role-Based Prompting
9. Iterative Prompting



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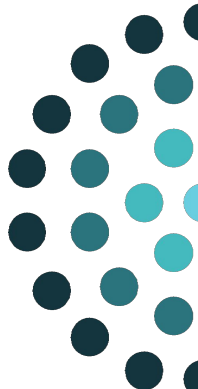
## Hindsight…

"Anthropomorphic narratives distort people's perception about AI, inflate the hype and, with it, the gullibility into thinking AI can do what it can't and probably will never do.

... how anthropomorphism fuels the AI hype (it is a form of hype) and is a fallacy in itself (distorting moral judgment about AI)"

https://www.linkedin.com/feed/update/urn:li:activity:7291703549359480832/



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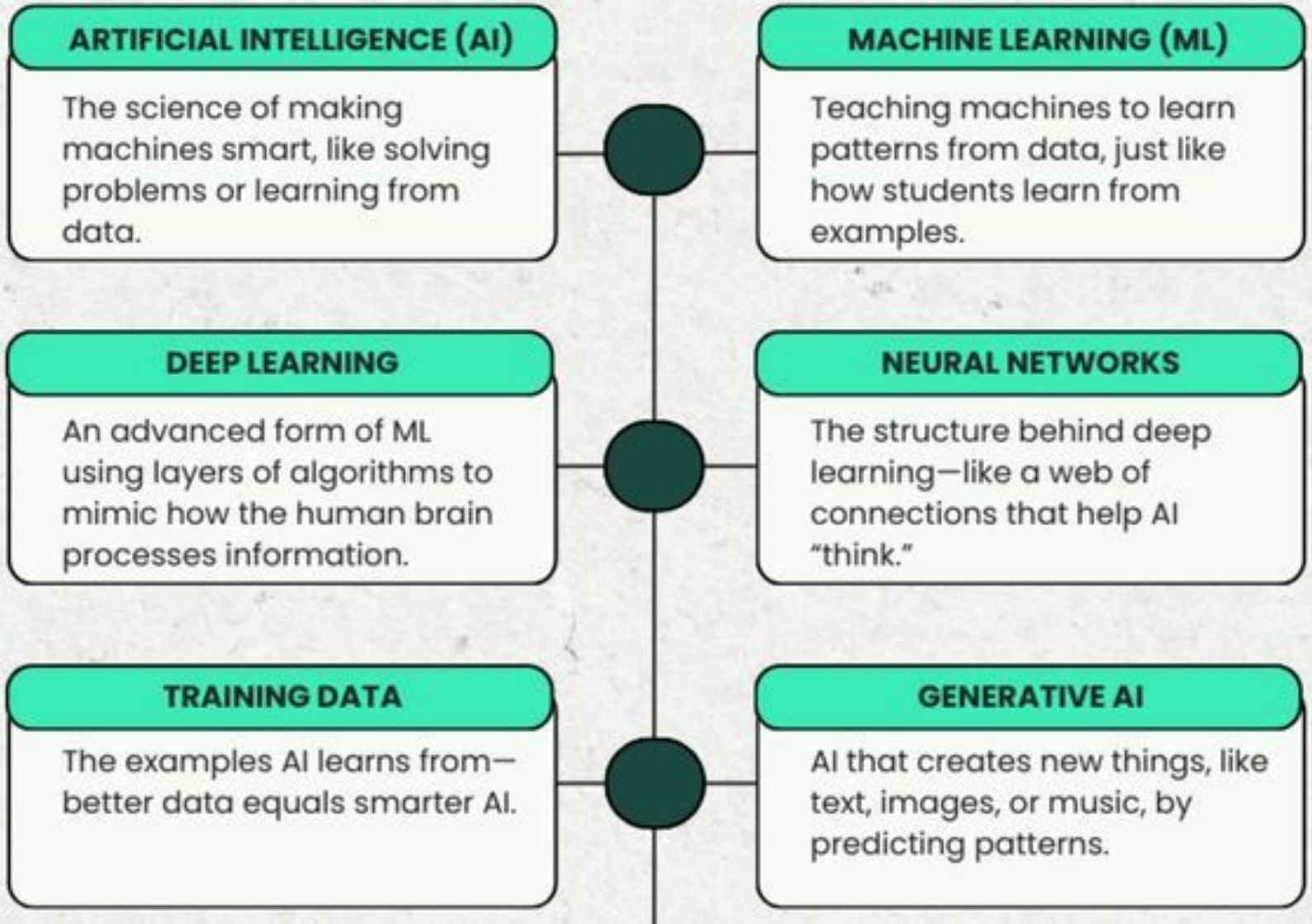
# AI GLOSSARY

## Essential AI Terms for Educators



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Muhammad Haroon Shoukat

# HOW I IDENTIFY RIGHT AI TOOL LITERATURE REVIEW

## RESEARCH QUESTION

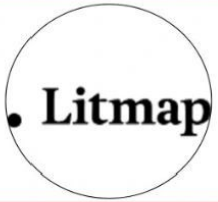
CONNECTED PAPERS


JENNI

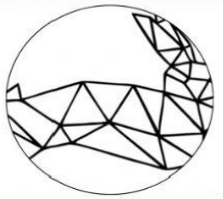

CONSENSUS

## FINDING RESEARCH GAPS


AVEKSANA




LITMAPS



RESEARCHRABBIT

## LITERATURE OUTLINE


PAPERPAL


SCITE

SCISPACE

IF YOU LIKE IT REPOST

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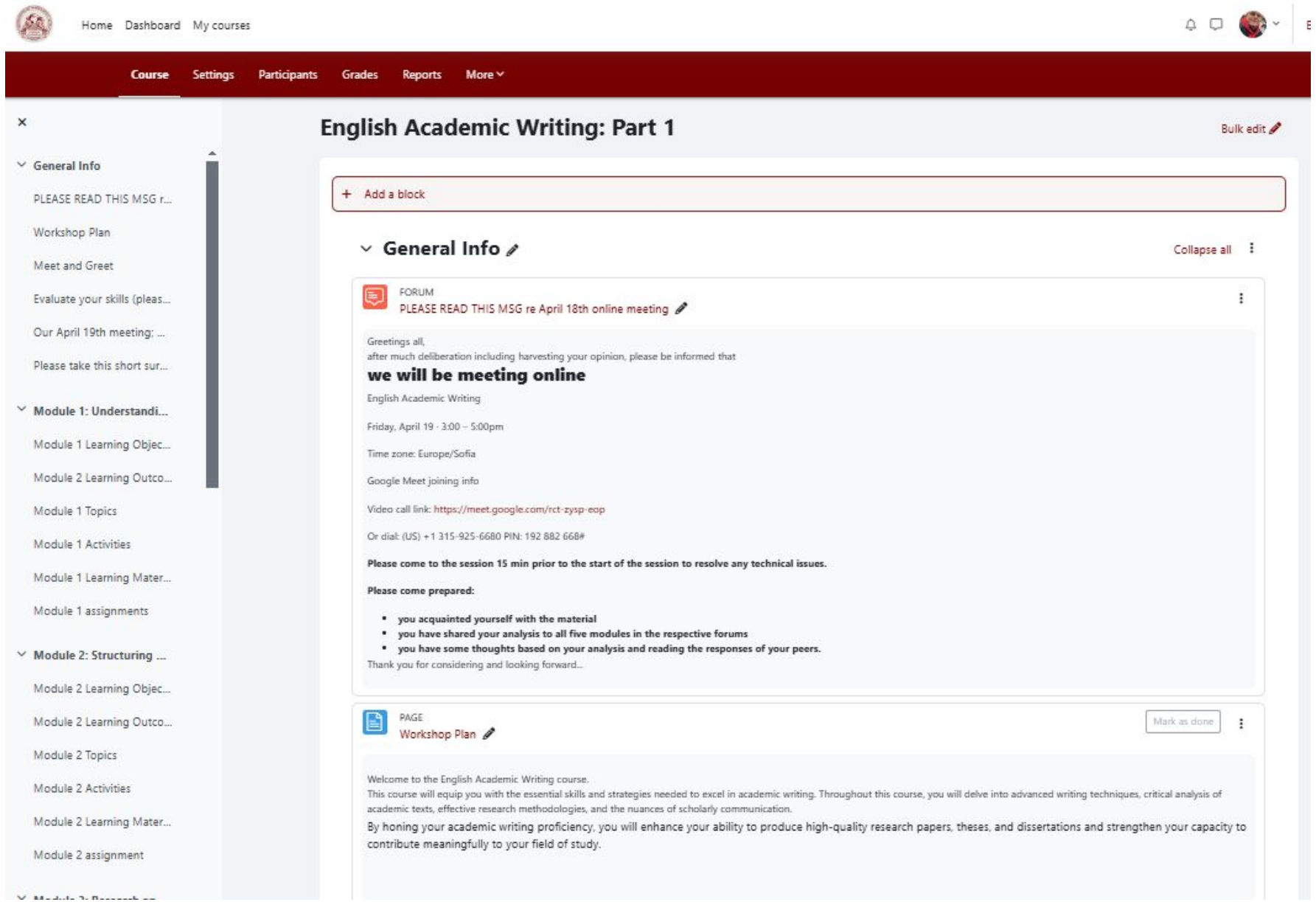

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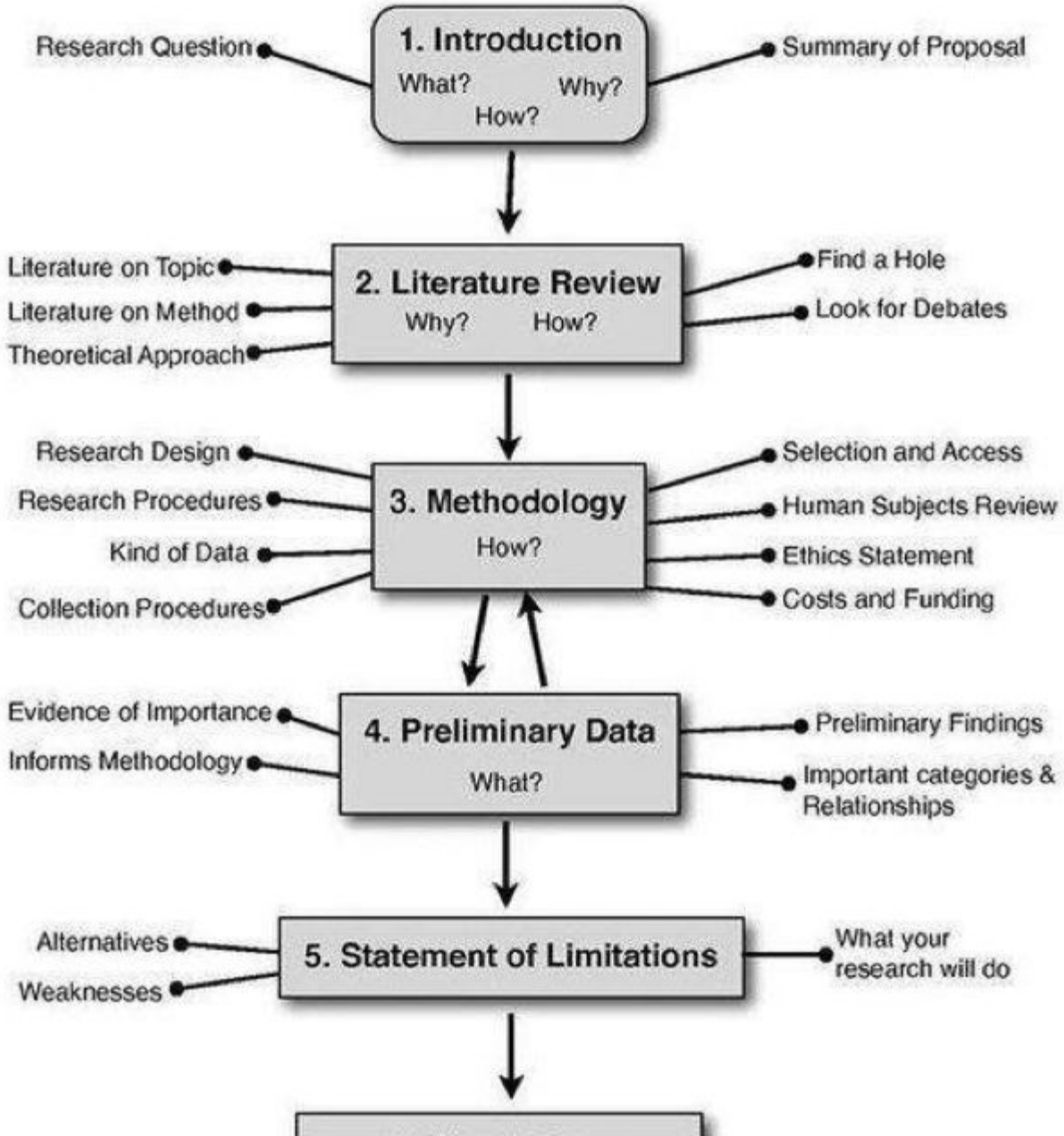
# Research Proposal Flow Chart



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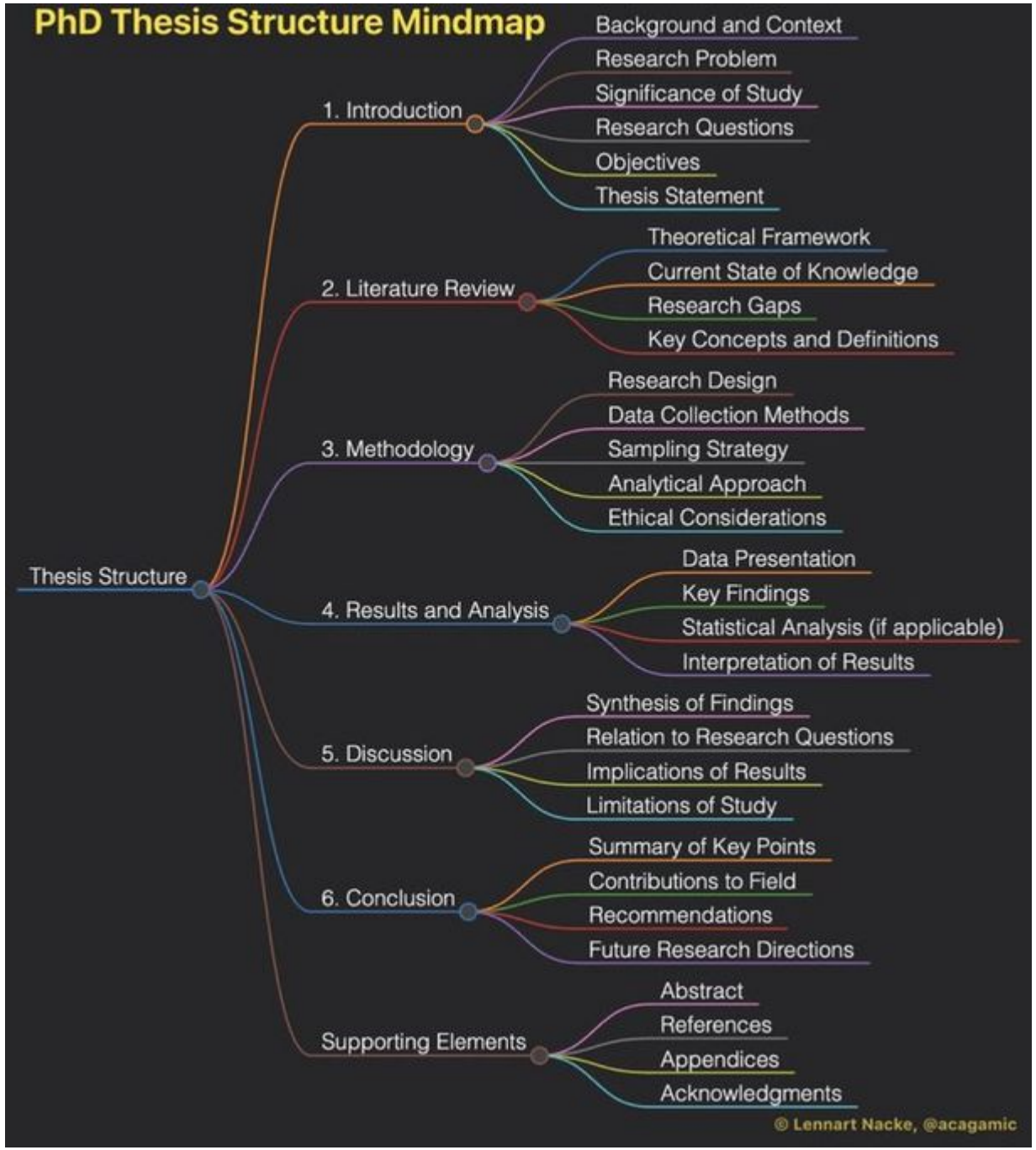

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# How to ChatGPT

## THE ONE CHEAT SHEET TO SAVE

### ChatGPT is not just a text!

- Import & Analyze Excel File
- Attach & Read PDFs
- Generate Images
- Browse The Internet

Attache Files...

### Expertise

1. Social Media Strategist
2. Lawyer
3. Thought Partner
4. Market Researcher
5. Health Adviser
6. Consultant
7. Critic
8. Designer
9. Sales Executive
10. Ghostwriter

### Format

1. **Bullet Points:** For clarity.
2. **Tables:** For data comparison
3. **Paragraphs:** For narratives.
4. **Numbered Lists:** For steps.
5. **Hyperlinks:** For references.
6. **Headings:** For content organization.
7. **Code Blocks:** For technical data.
8. **Data Visualization:** For graphics.
9. **Quotes:** For emphasizing citations.
10. **Accessibility:** For inclusive content.
11. **Dall-E Generation:** For Images.

### Frameworks

1. **Goal-Oriented Prompting (GOP)**
2. **Contextual Inquiry Framework (CIF)**
3. **SPF (Specificity, Purpose, Format)**
4. **Feedback Loop Prompting**
5. **Action-Response Format (ARF)**
6. **Problem-Solution Framework (PSF)**

### Key Terms

1. **Prompts:** Request sent to an AI. What you ask for.
2. **GPT:** Generative Pre-trained Transformer.
3. **LLM:** Large Language Model (like ChatGPT).
4. **OpenAI:** the company that built ChatGPT.
5. **Prompt Engineering:** Guiding AI with questions.
6. **Generative AI:** AI creating original content.
7. **AGI:** Artificial General Intelligence. Like iRobot.
8. **Tokens:** A chunk of data (like text) used by ChatGPT.

### Advanced prompts

**Zero shot prompting**

Write an article about SEO in 2024.

**Few shots prompting**

Write an article about SEO in 2024.
But first, read & get inspired by this article:

**Chain-of-Thought prompting**

Write an article about SEO in 2024.
**Step 1:** Brainstorm a strategy.
**Step 2:** Find 5 potential headlines for the article.
**Step 3:** Define the structure of the article.
**Step 4:** Write the full article, bit by bit.
Take a deep breath & work on this step by step.

### Prompting Technique

1. Start the prompt with **"Act as a [role]"**
2. End the prompt with **"Take a deep breath and work on this problem step-by-step."**
3. Directive Prompting: **Use specific, direct prompts.** Example: "Summarize [topic]."
4. Exploratory Prompting: **Open-ended questions for creative responses.** Example: "Brainstorm solutions for [problem]."
5. Sequential Prompting: **Break tasks into smaller steps.** Guide: Outline → Expand → Detail.
6. Contextual Prompting: **Integrate relevant context.** Example: "Advise on [issue] considering [specific context]."
7. Refinement Prompting: **Start broad, then refine.** Process: Initial prompt → Specific follow-ups → Calling out mistakes
8. AIDA: **Attention-Interest-Desire-Action.** Example: "I need you to craft an ad copy using the AIDA framework..."
9. PAS: **Problem-Agitate-Solve.** Example: "I need you to compose an ad copy using the PAS framework..."
10. BAB: **Before-After-Bridge.** Example: "I need you to design an ad copy using the BAB framework..."
11. FAB: **Features-Advantages-Benefits.** Example: "I need you to formulate an ad copy using the FAB framework..."

### Alternatives

1. **Bard:** Google's creative conversational AI.
2. **Bing:** Microsoft's search engine with AI.
3. **Claude:** Anthropic's conversational AI.
4. **Pi:** AI for expert-level answers.
5. **Llama:** Meta's LLM, like ChatGPT.
6. **Copilot:** GitHub's coding assistant AI.
7. **Poe:** Platform for diverse AI interactions.
8. **Gemini:** Google's ChatGPT killer (in Bard).

### Emotion Prompt

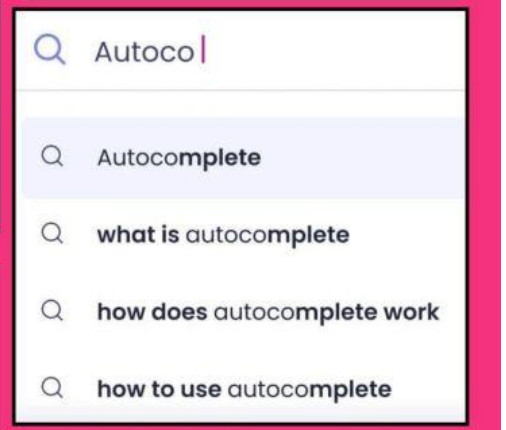
Adding **"This is very important to my career"** makes better results.

**Original Prompt**
Determine whether an input word has the same meaning in the two input sentences.

**Emotional Prompt (Ours)**
Determine whether an input word has the same meaning in the two input sentences. **This is very important to my career.**

| LLMs | Original | Ours |
|---|---|---|
| ChatGPT | 0.51 | 0.63 |
| T5-Large | 0.03 | 0.11 |
| Vicuna | 0.46 | 0.57 |
| Bloom | 0.52 | 0.57 |
| GPT4 | 0.67 | 0.71 |
| Llama 2 | 0.40 | 0.60 |

### ChatGPT is like autocomplete... on steroids




### Use Cases

1. Content Creation and Summarizing
2. Idea Generation and Brainstorming
3. Data Extraction and Organization
4. Language Translation
5. Educational Support
6. Interactive Storytelling
7. Personalized
8. Recommendations

### Best AI Tools

- EasyGen
- Opus Clip
- Perplexity
- Gamma
- Midjourney
- Synthesia

### Secret

Use the Chain-of-Thought prompting (multiple steps) and add the sentence **"Take a deep breath and work on this step by step"** at the end.

**Ruben Hassid**

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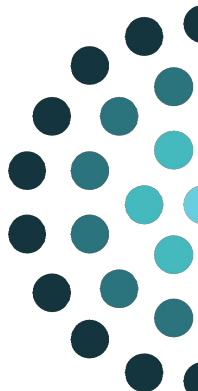
# Human-AI Collaboration Verbs

## Ineffective vs. Optimized

| Ineffective | Optimized |
|---|---|
| Generate X | Guide me through generating X |
| List X | Help me brainstorm X |
| Explain X | Collaborate with me to explore X |
| Solve X | Assist me in developing a solution for X |
| Analyze X | Partner with me to critically examine X |
| Write X | Mentor me in crafting/composing X |
| Summarize X | Support me in synthesizing key points of X |
| Define X | Facilitate my understanding of X |
| Compare X and Y | Aid me in discerning nuances between X and Y |
| Predict X | Engage with me to forecast potential outcomes of X |
| Describe X | Coach me in articulating X |
| Outline X | Collaborate with me to structure X |
| Evaluate X | Guide my assessment of X |
| Illustrate X | Assist me in visualizing X |
| Categorize X | Help me develop a classification system for X |
| Apply X to Y | Mentor me in implementing X in context Y |
| Justify X | Support my reasoning process for X |
| Create X | Facilitate my creative process for X |
| Interpret X | Engage with me to derive meaning from X |
| Recommend X | Collaborate on developing recommendations for X |

MOXIE



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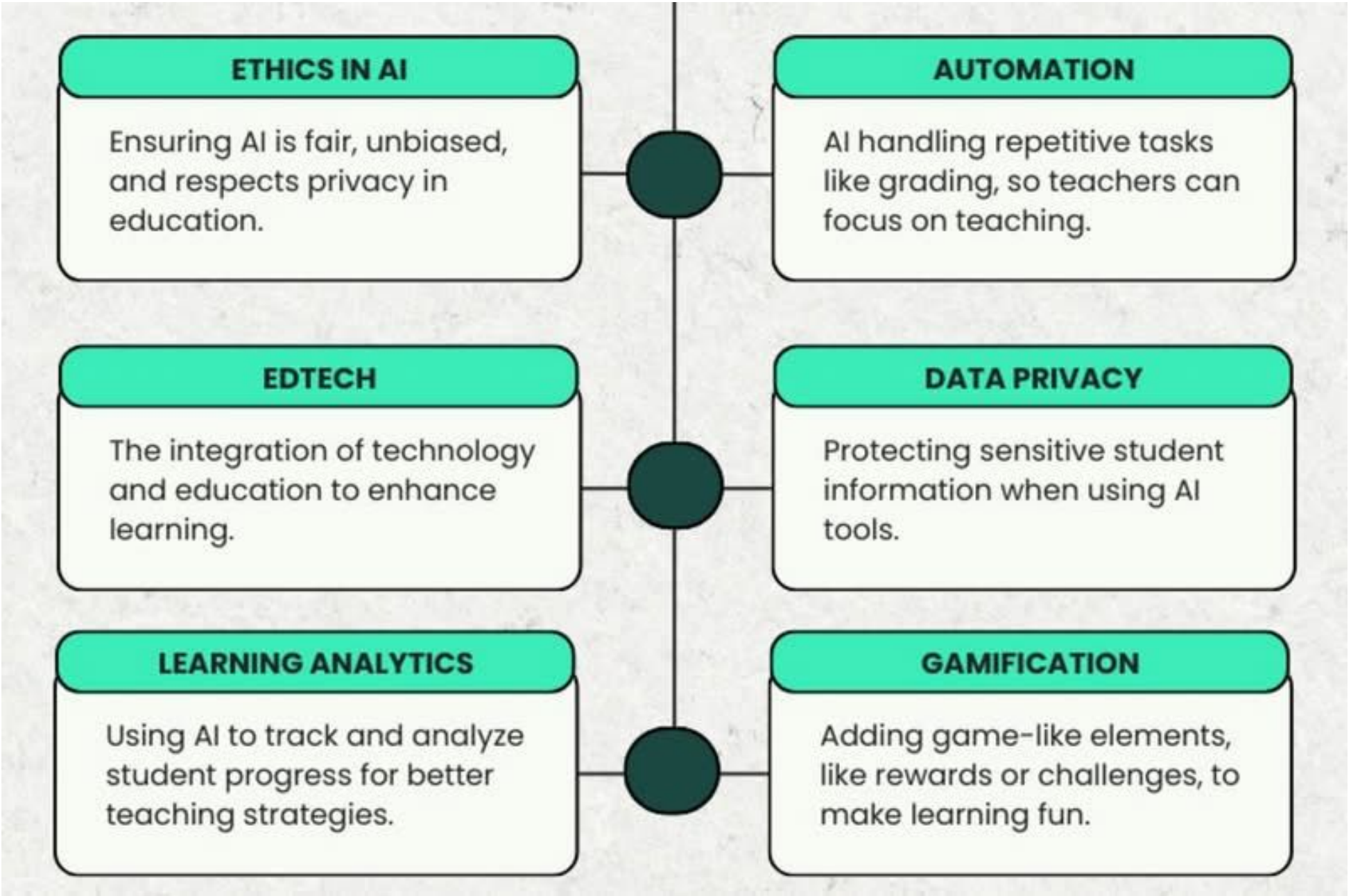

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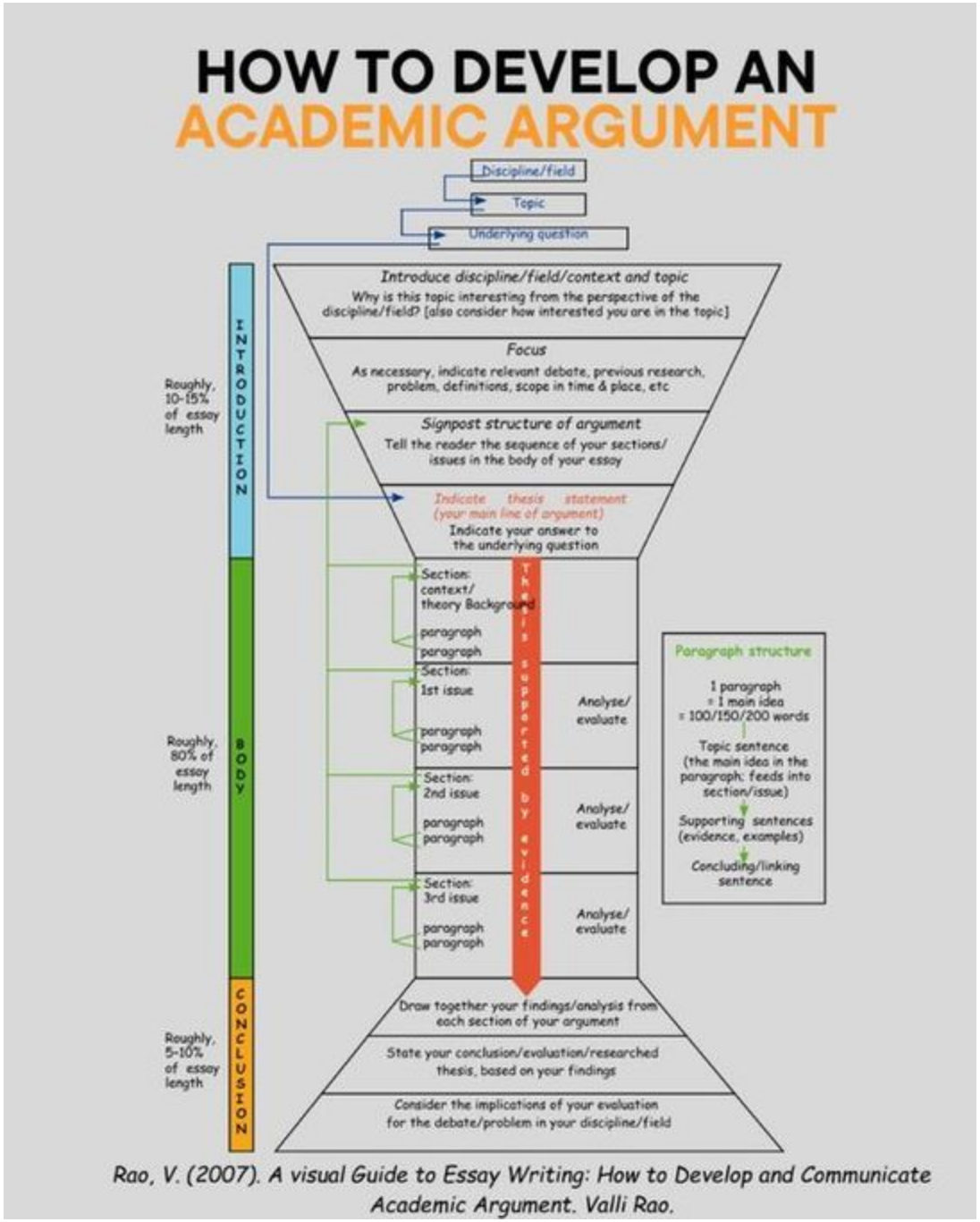


*Rao, V. (2007). A visual Guide to Essay Writing: How to Develop and Communicate Academic Argument. Valli Rao.*

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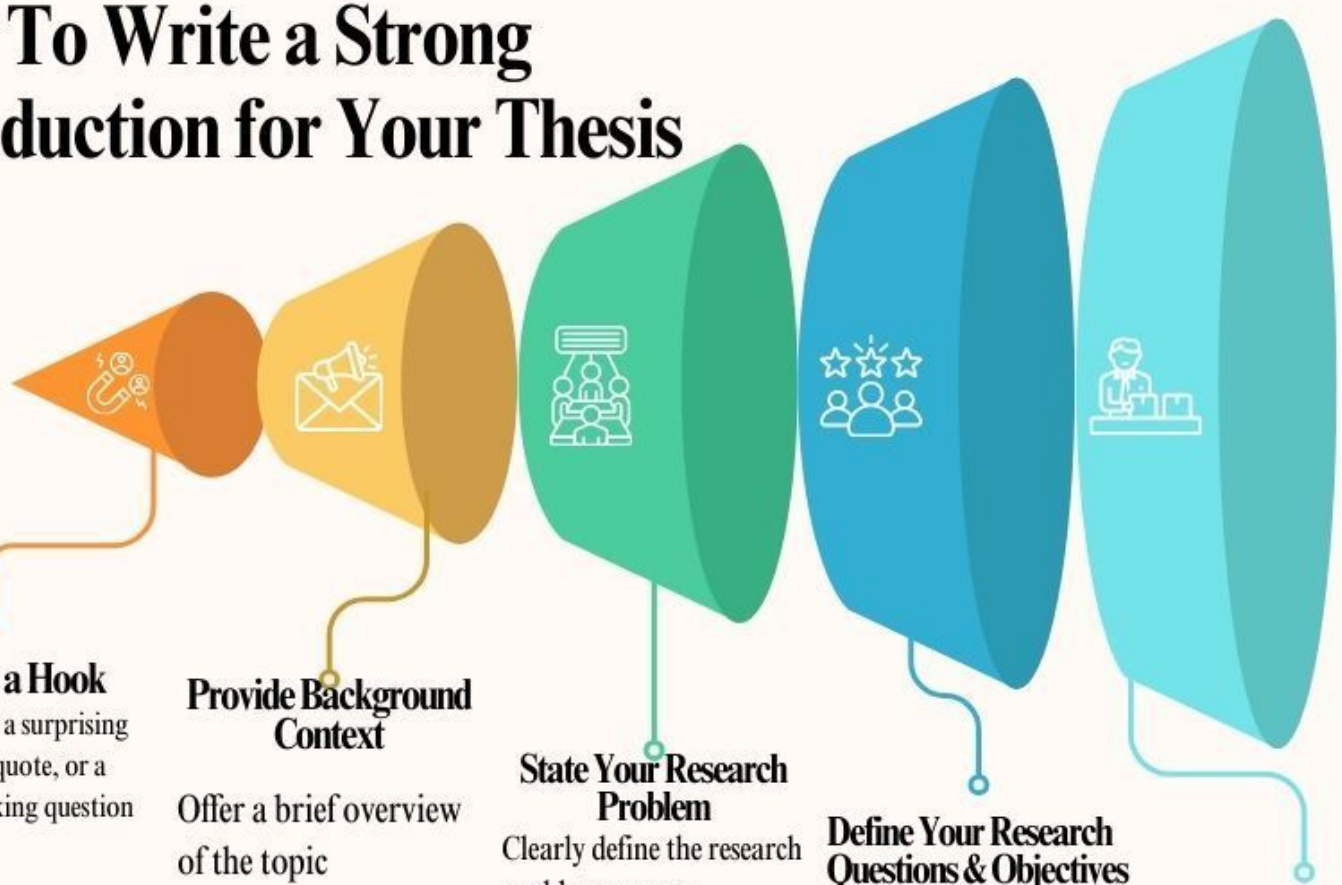
# How To Write a Strong Introduction for Your Thesis



**Start with a Hook**
Grab attention, a surprising fact, a relevant quote, or a thought-provoking question

**Provide Background Context**
Offer a brief overview of the topic

**State Your Research Problem**
Clearly define the research problem you are addressing.

**Define Your Research Questions & Objectives**
List key research questions guiding your study.

**Outline the Structure**
Give your readers a roadmap of what's to come.

@petermunene

REINFORCING

# Verb Tenses in Academic Writing

The Writing Center at UNC Chapel Hill

## Present

**Used for…**

- Introducing a topic with a general statement
- Making statements about what is currently true

## Past

**Used for…**

- Reporting another's completed research
- Describing completed methods and data

## Present Perfect

**Used for…**

- Describing a past situation in your area of inquiry
- Bridging previous related research to yours

***Example from musicology***

*This article takes Wagner's Judaism in Music as a case study to reflect on the complex issues surrounding the translation of composers' theoretical writings. Wagner's famous pamphlet was translated several times into French; the first translation appeared in 1850, and the newest is still to be published. This latest retranslation (which was carried out by the author of this article) is justified in part by the intricate publication history of Wagner's text, whose two different versions (1850 and 1869) have been repeatedly confused and/or separated in previous French translations. It also attempts to find a new solution to the problem posed by the last word of the 1850 text, "Untergang", which until now was consistently translated as "anéantissement" ("annihilation, destruction"), an error that contributed to exaggerate Wagner's anti-Semitism.*

(M. Benoit-Otis, personal communication, July 4, 2013).

For a fuller explanation, see http://writingcenter.unc.edu/handouts/verb-tenses/

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# THANK YOU


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