



AI-Manual

Cutie

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# Introduction

# Foreword

This is a quick draft / proof-of-concept of a booklet about using AI in learning and education, the intention is to build it in several parts:

- Introduction with general tips for AI (bias, hallucinations, learning vs getting-things-done / dovenskabsfælden, ...)
- **List of learning activities** *Primary part.*
- Useful pedagogical concepts (zone-of-proximal-development, constructionistic learning(Papert), spaced repetition, blooms taxonomy, learning modalities, ...)
- Notes about AI (how does LLMs work, overview of tools ultimo 2024, RAGs, embeddings, ...)

with each section partly LLM-generated, but humanly worked through.

The thought is to make it as a physically printed book, as there is something nice about books and physicality. (Using the 17x22cm book format).

When opening a random page, it should usually start with a new activity/topic on the top left of the page opening, making it interesting to just browse around in.

# Learning activities

# Ad-Hoc Data Analysis and Visualization with LLMs

Large language models (LLMs) can simplify ad-hoc data analysis, making it easier to derive insights from data—especially for those without coding or data science expertise.

## Why Use LLMs for Ad-Hoc Data Analysis?

Ad-hoc data analysis is about quickly exploring data to answer specific questions or gain insights. LLMs allow users without coding skills to perform tasks like data cleaning, statistical analysis, and visualizations by making the LLM generate and execute the relevant code. This means that non-coders can transform raw data into insights . For students, researchers, and professionals without technical expertise, LLMs make data-driven problem-solving more accessible and intuitive.

LLMs are also valuable for generating visualizations and illustrations. They can transform data into meaningful visuals, such as charts, graphs, and even infographics, making complex information easier to understand and share. This visual capability helps users convey insights more effectively, especially when communicating results to non-technical audiences.

## **Caveats to Keep in Mind**

When using LLMs for data analysis, it's essential to understand what the LLM is doing. It may make errors or inefficiencies so the Users must carefully review the process and results.

## **Practical Tips**

Tools like Claude and ChatGPT can generate code for visualizations and analyses. For example:

“Create a word cloud of the most important concepts in this text.”

These LLMs can guide users through data exploration, help visualize findings, and make data analysis more approachable and efficient.

# Practice Foreign Language

Using ChatGPT Advanced Voice Mode to practice foreign languages can offer a flexible and effective way to improve fluency, comprehension, and confidence through interactive conversation.

## **Pedagogical Motivation**

Practicing foreign languages with ChatGPT Advanced Voice Mode helps learners build fluency in a low-pressure environment. It encourages consistent practice, which is essential for language acquisition. Learners can get real-time practice, engage in interactive conversations, and refine their pronunciation skills through repeated exposure to native-like language patterns. The ability to practice at any time makes it highly accessible and convenient, supporting personalized learning paths.

## **Caveats and Potential Dangers**

One challenge of using AI for pronunciation practice is that learners might adjust their pronunciation to be better understood by the AI, which may not always reflect the most accurate or natural way to pronounce certain words. It's important to use supplementary resources to ensure correct pronunciation.

Additionally, while ChatGPT can simulate realistic conversations, it does not replace the nuanced and unpredictable dynamics of speaking with a human. Real-life conversations require interpreting body language,



emotion, and spontaneity, aspects that are not fully replicated by AI.

## Benefits

Practicing with ChatGPT Advanced Voice Mode offers several benefits, such as immediate feedback, which helps learners correct mistakes in real time. The availability of an always-ready practice partner allows users to engage in consistent language practice without depending on others' schedules, promoting more frequent and flexible practice.

## Tips for Effective Use of ChatGPT Advanced Voice Mode

To get the most out of ChatGPT Advanced Voice Mode, consider asking specific questions to guide your learning:

- Use prompts like, “**How do I say [specific phrase] in [target language]?**” to expand vocabulary.
- After speaking a sentence, ask, “**Which part of my pronunciation needs the most improvement?**” to receive targeted feedback.
- Explore alternative phrasing by asking, “**What are other ways to say that?**” to build versatility in expression.

## How to do it

Initiate practice by saying, “**Let’s practice speaking in [target language].**” This helps set the language context, and you can continue by exploring different topics or responding to prompts to create a more immersive practice session.

# Generating Spaced Repetition Cards with LLMs

Using large language models (LLMs) to generate spaced repetition cards is an efficient way to improve learning retention through personalized, dynamic prompts.

## Pedagogical Motivation

Spaced repetition strengthens memory by revisiting information at optimal intervals. Tools like Anki use algorithms to schedule reviews just before the learner forgets, maximizing efficiency. LLMs help create tailored flashcards quickly, breaking down material into manageable parts to enhance long-term retention. This approach supports both students and professionals in mastering complex concepts.

## Caveats

AI-generated cards may lack context or contain inaccuracies if the source material is unclear. Additionally, generating flashcards manually is itself a learning process—by using AI, learners might miss out on the benefits of actively engaging with the material during card creation. Review and edit cards for accuracy. Over-relying on AI can also lead to shallow understanding—combine AI-generated cards with comprehensive study methods for deeper learning.

## Benefits

LLMs make it easier for learners to apply spaced repetition to their learning process by simplifying the generation of cards. This convenience encourages more consistent use of spaced repetition techniques, ensuring that learners can effectively reinforce their knowledge without the barrier of manually creating each card. Flashcards can cover definitions, key topics, and nuanced concepts, supporting versatile learning. LLMs adjust card complexity to match learner progress, ensuring an adaptive study experience.

## Tips

- Use prompts like “**Generate flashcards about [specific topic].**” to create focused cards.
- For fundamentals, ask “**Explain [concept] in simple terms.**”
- Diversify cards by requesting “**multiple-choice, true/false, and open-ended questions.**”

## How to Use LLMs for Flashcards

Input your source material (e.g., textbook excerpts or notes) and specify the type of cards needed, such as “**Generate spaced repetition cards for the key points.**” Refine generated cards, then add them to Anki or similar tools. Anki’s algorithm will schedule reviews for optimal retention.

LLMs are valuable tools for creating effective, diverse study materials, making the learning process more engaging and efficient.

# Information search

While LLMs may not be the best for information search, – they are really useful for helping out with search strategies, related areas to search within, etc.

Certain LLMs, such as Perplexity, are optimized for answering questions using academic knowledge and providing references.

Other LLMs include features like integrated search capabilities and APIs, such as library APIs.

## Caveats and Potential Dangers

LLMs may generate inaccurate or entirely fabricated references, including incorrect details about the content of those references. This phenomenon, known as ‘hallucination,’ occurs because the model generates responses based on patterns in the data it has seen rather than verified facts.

Always double-check the information provided, and read or verify the original content to ensure accuracy and reliability.

Use subject-specific search tools and library catalogs to find reliable information for your research.

## Benefits

Using LLMs can help you develop better search strategies by suggesting related terms and alternative approaches to searching. For example, when you are trying to gather information on a topic, LLMs can help you brainstorm related areas to explore and keywords you might not have considered. They are also effective for demonstrating different ways to frame a search query, making it easier to refine your approach. This versatility helps broaden your understanding and makes your searches more comprehensive, ultimately leading to more reliable and diverse information sources.

# Quizzes based on learning materials

Feed the LLM with an article, paper or similar, and ask it to make an interactive quiz about the content of this paper.

## Pedagogical motivation

Interactive quizzes based on learning materials offer significant pedagogical advantages, primarily through their ability to foster active learning, deliver immediate feedback, and improve recall and retention.

By encouraging active engagement, interactive quizzes transform the learning experience from passive consumption to active practice. Rather than simply reading or listening, students are prompted to recall, apply, and analyze the material, which leads to a deeper understanding. This active involvement helps solidify the information in their memory, making it easier to retrieve later. The more frequently students engage with the material through practice, the more likely they are to retain what they have learned.

## Prompt examples

A simple approach is to copy-paste or attach it, and then use a a prompt like:

Do an interactive quiz about the above/attached topic. Ask a question with 6 possible answers, let me reply, and then elaborate on the answer and ask another question.

and if the questions are too easy(or hard):

Continue, and make the questions harder.

# Reworking Notes and Course Materials

Reworking course materials—clarifying own notes, enhancing understanding, and turning content into cohesive resources can be an additional approach to learning. By reviewing and improving their materials with AI, students can boost their comprehension and retention.

## Usage and Benefits

Using AI to refine course materials means inputting notes or lectures into an AI platform that reorganizes, summarizes, or expands the content. For example, students can feed handwritten notes into an AI tool for clearer, more structured versions. The AI highlights key concepts, defines complex terms, and suggests connections between topics.

This process is active learning. Comparing original notes with AI-enhanced versions forces students to assess the information critically. Verifying AI content requires revisiting source material, reinforcing learning. This improves study materials and deepens engagement.

Teachers can use AI to create accessible teaching materials. Lesson plans or lecture notes can become simplified summaries or visual aids, catering to different learning styles.



## Cautions

AI-generated content can contain errors, especially with complex topics. Always verify AI output to avoid misunderstandings.

Over-reliance on AI may hinder critical thinking and note-taking skills. There are also ethical concerns, such as academic dishonesty if students use AI without understanding the content.

## Tips for Effective Use

- **Verify Content:** Always cross-check AI-generated information with reliable sources.
- **Use AI as a Tool:** Enhance learning materials, but continue practicing traditional study methods.
- **Be Ethical:** Ensure all work is understood and properly credited.
- **Choose Reliable Tools:** Use reputable AI platforms to minimize errors.
- **Engage Actively:** Use AI to prompt further questions and exploration.

# Getting Feedback on Draft Texts

Using ChatGPT to get feedback on draft texts can be a flexible and efficient way to improve your writing, refine ideas, and gain clarity through interactive suggestions.

## Pedagogical Motivation

Receiving feedback on writing drafts is crucial for developing writing skills. Using ChatGPT to get feedback on draft texts allows writers to iterate quickly and identify areas of improvement. It provides immediate and non-judgmental suggestions, making the revision process smoother and less intimidating. By using AI, learners can get tailored advice that focuses on specific concerns such as grammar, flow, tone, and structure, which can enhance both technical writing skills and creativity.

The ability to get instant feedback allows writers to refine their drafts in real-time, providing a convenient way to practice and improve. The interactive nature of ChatGPT also helps learners think critically about their choices, as the AI can pose questions or offer alternative ways to structure or express ideas, thereby deepening their understanding of effective writing techniques.

## Caveats and Potential Dangers

While ChatGPT provides valuable feedback, it is important to be aware of some limitations. AI feedback may not always align with nuanced or complex stylistic choices, and its suggestions can sometimes be overly general. Writers should be careful not to become too reliant on AI-generated feedback, as it might limit their personal voice and creativity over time.

Additionally, ChatGPT may occasionally miss contextual subtleties or cultural nuances that are critical in certain pieces of writing. It's essential to use AI feedback as a tool alongside human input, especially for texts that require emotional nuance or a deep understanding of context.

## Benefits

Using ChatGPT for feedback offers several advantages, including instant suggestions that can help writers identify and correct errors early. The tool is available anytime, which makes it perfect for students or professionals working on tight deadlines. Moreover, the iterative nature of the feedback helps writers learn progressively, refining their skills with each version of their draft.

The AI's ability to provide different suggestions for phrasing, tone, or structure can help broaden a writer's perspective. This can lead to more dynamic writing and the exploration of new approaches, ultimately improving versatility and adaptability.

## Tips

To get the most out of ChatGPT when seeking feedback on your drafts, consider specifying the kind of feedback you need:

- Ask **“Can you help improve the flow of this paragraph?”** if you are struggling with transitions between ideas.

- Use “**Does this sentence convey the intended tone clearly?**” to ensure your writing aligns with the desired emotional impact.
- Request alternative word choices by asking, “**What are some other ways to say this more concisely?**” to enhance clarity and precision.

## How to do it

Start by copying your draft text into the prompt and asking for specific feedback. You might say, “**Here is my draft introduction for an essay. Can you help me improve clarity and tone?**”. Continue the interaction by accepting or rejecting suggestions, discussing alternatives, and iterating on the draft until you feel satisfied with the outcome. The conversational nature of the process makes refining your text more engaging and insightful.

# Text Processing with LLMs

Language Learning Models (LLMs) can handle large-scale text management efficiently. They automate tasks like analyzing entire documents, making adjustments, and reducing manual effort significantly.

LLMs can process documents quickly, enabling widespread changes such as correcting formatting, replacing terms, and applying stylistic changes. This ensures consistency and saves time, especially for longer texts.

LLMs can also adjust the tone or voice of a document, making it suitable for different audiences. Whether adapting a formal report for a professional audience or making content more casual, LLMs can rework the tone while retaining the core message.

Another key feature is transforming keywords or notes into a complete draft. This helps users move from ideas to a structured draft quickly, providing a solid foundation for further editing.

## Caveats and Dangers

LLMs may sometimes alter the meaning of text, leading to misinterpretations. This happens because LLMs generate content based on learned patterns, which may not always capture the author's intent.

Additionally, LLMs may introduce an inconsistent voice that differs from the original tone, affecting documents that need a specific style. This can make the text feel disjointed or misaligned with its intended audience.

Don't rely too heavily on LLMs, as they may not always understand the full context or the specific nuances of your writing. Use them as a tool to assist you, but make sure to apply your own judgment and verify any changes made.

## **Tips for Effective Use**

Use LLMs to fix grammar and spelling mistakes, ensuring the text is error-free and reads smoothly.

LLMs can ensure consistent use of terms across the text to maintain clarity and uniformity, and also give rough feedback on the document.

# Transcription

Artificial Intelligence can be used for transcribing qualitative interviews, aiding students in refining their presentations and exam preparations, and also transcription of lectures to make them more reviewable.

## Practical Applications and Pedagogical Motivation

### Transcription of Qualitative Interviews

In research-oriented courses, students often conduct qualitative interviews to gather data. AI transcription tools can quickly convert these audio recordings into text, allowing for easier analysis and coding of responses. This accelerates the research process and enables students to focus on interpreting the data rather than transcribing it manually.

### Recording and Refining Thought Processes

Students can record their thought processes, explanations, or practice presentations using AI transcription tools. The transcribed text can then be reviewed, edited, and reworked to improve clarity and coherence. This practice encourages self-reflection and iterative learning, helping students to articulate their ideas more effectively and develop stronger communication skills.

## **Transcription of Lectures**

Teachers can use AI transcription tools to transcribe their lectures, providing students with written materials that complement oral presentations. This is particularly beneficial for students who may have difficulty keeping up with note-taking during class.

## **Benefits**

AI transcription tools provide several benefits in educational settings. One key advantage is time efficiency. They speed up the process of converting speech to text, allowing more time for engaging in meaningful learning activities.

Additionally, these tools improve accessibility by supporting students with hearing impairments or those who benefit from reading along with audio content.

They also enhance learning materials by creating comprehensive resources that students can revisit for study and revision.

Finally, AI transcription tools facilitate language learning by helping non-native speakers through written text accompanying spoken language, thereby aiding in comprehension.

## **Caveats and Considerations**

Despite their many benefits, AI transcription tools come with certain caveats and considerations. Accuracy can be an issue, as these tools may not always produce perfect transcriptions, especially when dealing with technical terms or accents.

Privacy concerns are also important to consider, as recording and transcribing conversations may raise ethical issues. It is essential to always obtain consent and adhere to data protection regulations.



There is also the risk of overreliance on technology, which might hinder the development of traditional skills such as note-taking and active listening.

Finally, the cost and accessibility of advanced transcription tools can be a barrier for some users, as many require subscriptions or fees.

## **Tips for Effective Use**

To make the most out of AI transcription tools, there are a few tips to consider. It is important to proofread transcriptions to ensure accuracy and completeness.

Using quality recordings can significantly improve transcription accuracy, as clear audio is easier for AI to process.

Combining transcription tools with other educational technologies, such as learning management systems, can provide streamlined access and integration.

Lastly, educating students on the ethical use of these tools is crucial, particularly around issues of consent and data privacy when recording others.

# Transforming Text into Speech

Transform text into audio format for multimodal learning.

## Pedagogical Motivation

Transforming text into speech offers numerous pedagogical benefits, particularly by leveraging multiple learning modalities, fostering engagement, and enhancing comprehension and retention. By presenting information in audio format, students are encouraged to engage with the content in different ways. This approach caters specifically to auditory learners and helps create a more inclusive learning environment. For instance, students who may struggle with reading often find it easier to understand material when it is presented audibly. By converting content into spoken form, learners are more likely to stay engaged and effectively retain information.

Additionally, audio content allows students to absorb information in situations where reading might not be practical, such as during commutes or while performing other activities. This convenience means that learning can become a more continuous process, offering more opportunities to revisit and reinforce material over time. Audio can also add a personal element, with conversational tones and storytelling that make learning more relatable and enjoyable.

In short, using AI to transform text into speech not only enriches the overall learning experience but also supports different learning preferences, making the content more accessible and engaging for all types of learners.

## Caveats and Potential Dangers

While text-to-speech technology offers numerous benefits, it also presents some challenges. Audio content is inherently linear, making it difficult for students to skim or quickly locate specific information compared to written text. Without visual cues such as headings or bullet points, complex ideas may be harder to understand and retain.

Listening also demands sustained attention, which can be challenging, particularly for longer content. Unlike reading, where learners can easily pause or skip sections, audio requires a continuous focus that may not be practical for all students. Moreover, the quality of the TTS voice matters—poor pronunciation or unnatural intonation can reduce engagement and comprehension.

Finally, TTS may not be accessible to students with hearing impairments. To ensure an inclusive learning experience, providing content in multiple formats is essential.

## Tips for Effective Use of Text-to-Speech

To effectively use text-to-speech technology, it's important to blend audio with written content, giving students the flexibility to choose their preferred format. Supplementing audio with visual aids like diagrams can further clarify complex topics, making them easier to understand.

Keeping audio content concise and segmented into shorter, manageable pieces can help maintain attention and prevent listening fatigue. The quality of the TTS voice is also crucial—using natural, clear voices can make the content more engaging and comprehensible.

Playback controls are vital for personalizing the experience, allowing students to pause, rewind, or speed up the content. High-speed playback is particularly helpful for quickly reviewing familiar material, making learning efficient.

Adding interactive elements such as quizzes or reflective questions can

further deepen engagement by prompting students to actively think about the content. Finally, ensuring accessibility by providing alternative formats, like transcripts, helps cater to diverse needs, ensuring everyone has equal access to the materia

## **Popular AI TTS Tools for Education**