

ChatGPT and Bing: A Practical Guide

- *A versatile guide for using AI professionally and in higher education***

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Introduction and basic info

Welcome to this practical user guide for ChatGPT and Bing. I have developed (and am developing) this document as a response to the ongoing disruption AI tools are causing in society, professional life, and in particular in higher education. ChatGPT and Bing are chatbots, but their capabilities - when used correctly and intelligently - can be force multipliers for individual productivity, creativity, and learning.

However, since ChatGPT first arrived in November, 2022, I have found that both colleagues (i.e. university professors) and students have struggled not only with how to use ChatGPT (and later Bing) effectively and efficiently, but also what intelligent use implies for teaching and research practice as a university. I have also increasingly found that this guide has been useful outside of the university context. Thus, I am adapting the guide to be more generally applicable to anyone who wants to understand how to use AI tools in a professional context, while still maintaining many examples that relate to the context I know best: University.

Why this document is necessary for the democratisation of AI skills

Here is a short list of some of the things I am going to explain in this document:

- How to have an AI explain what your teacher is teaching better than your teacher
- How to organise and structure ideas for essays and analysis
- How to use AI to generate training questions and exam questions (and indicative answers)
- How to integrate AI as a co-teacher in a university course and [develop new modes of learning](#)
- How to make AI your research co-pilot and creative partner
- How to use AI tools to make your research process more fun, creative, and efficient

There is an ever-increasing supply of people online who are coming up with more-or-less useful ways to use the tools in different settings. Some are trying to sell you stuff, some are trying to market their startup, and some are just generally useful. I take departure in much of the work by [Ethan Mollick](#) (you should [definitely check him out](#)) but also collate other people's work, and perhaps most importantly draw on the impressions I am getting in real time from students using it in the classroom and my own tinkering with it for teaching and research.

Since students inevitably will find a way to use ChatGPT, Bing, and other AI tools to cheat at exams, the solution to the advent of individualised AI tools is, in my view, not to try to suppress them. That will result in an 'open secret' about the incredible usefulness of AI tools, resulting in dysfunctional teaching. Instead, I strongly believe that it is educators' responsibility to adjust not only exam formats, but also teaching requirements and content to reflect these new capabilities. We did not freeze teaching when the pocket calculator and the internet became widely used, and we should not freeze teaching in the face of the individualised AI revolution. This is also the reason for why a large section in this document is dedicated to helping teachers integrate AI tools into their teaching practice.

From my point of view, many students are struggling to understand the capabilities of the different AI systems and how to use them to make studying easier. Inadvertently, the anecdotal evidence I have seen is that students can make their studying harder by trying to use the AI tools ineffectively, thus spending less time actually learning the material and getting behind on coursework. If you are one of those students, then this document is for you.

University teachers are, of course, scrambling to adjust exam formats to the age of AI-written text. However, my contribution is to offer ways that AI can enhance teaching, and it can make it incredibly easy to solve tedious tasks. This frees up time and effort by teachers to focus on interacting with students or being creative with didactical methods. If you are a teacher who wants to think about integrating AI into your teaching, then this document is for you.

Perhaps most interestingly, ChatGPT and Bing (and the host of secondary AI-powered tools already available) can act as powerful tools for researchers. This is perhaps a perspective that is being discussed the least. There is less developed guidance and ideas for researchers in the way they can use these AI tools to augment their research practice. If you are one of those researchers who want to learn more about (or contribute to) the discussion on the use of AI in research, then this document is for you.

As a general note, I want to stress that from this point on in time, the ability to use a tool like Bing or ChatGPT in a professional context is a skill that must be learned and understood. This is no different from the way understanding how to use computers became a tool in the 80s and 90s for office workers. But since there is no consolidated knowledge about how to use it, not standards for integration into workflows, no best-practice guidance in any way, and - perhaps most importantly - that you can use the tools as an individual immediately and in a meaningful way, it is necessary for all of us to develop some ideas about how to use AI productively. So that's why this document exists.

In the rest of this section, I will briefly explain what ChatGPT and Bing are, respectively. As a fun little exercise to the reader, you can try to spot which parts of the text were written by the AIs themselves, and which ones were written by me. You get 5 points for participation.

What is ChatGPT?

ChatGPT is a natural language processing tool driven by AI technology that allows you to have human-like conversations and much more with a chatbot. The chatbot can answer questions, assist you with tasks such as composing emails, essays, and code, and generate creative content such as poems, stories, and jokes.

ChatGPT is originally built on top of OpenAI's GPT-3 family of large language models, which are trained on billions of words from the internet. ChatGPT has been fine-tuned using both supervised and reinforcement learning techniques to improve its conversational skills. ChatGPT can understand your intent, context, tone, and emotions from your messages and

respond accordingly. In March 2023, GPT-4 was revealed and immediately made publicly available through the subscription plan for ChatGPT and through the API.

However, ChatGPT cannot access the internet. At its core, ChatGPT basically predicts what a legitimate output looks like given the input and its training. For example, if I ask ChatGPT to make a list of research articles in supply chain management about AI disruption, the default ChatGPT (version 3.5) will make up articles 100 % of the time because those articles do not exist. It has no way of “knowing” whether the articles exist or not, it only produces text that seems reasonable to the reader. This is an absolutely crucial point to be aware of. However, generally, the GPT-4 model (paid version) is better at conveying correct information and ‘hallucinates’ less.

What is Bing?

[Bing](#)¹ is the integration of a version of ChatGPT into the Bing search engine made by Microsoft. It retains many of the same features of ChatGPT, but is restricted in terms of maximum number of user inputs per day and the maximum number of messages in a chat session (although Microsoft has indicated that both of these restrictions, over time, will be lifted as the model improves).

There used to be two main differences between ChatGPT and Bing, with the first being Bing's ability to access the internet. Bing can integrate search results into its model output, which is an immense step forward in capability compared to ChatGPT. As I will discuss later, Bing can combine search terms and use them both for creative and productive reasons. The second difference is now known to be inaccurate, as it was discovered that Bing had actually been powered by GPT-4 - the newest version of the model behind ChatGPT - all along. This means that the underlying AI model is no longer a point of distinction between the two.

A note on current development of Bing and ChatGPT

Many of the examples used in this document are used with Bing before the 10th of March. As Microsoft and OpenAI continue to tweak the models and their integration in Bing, you may find that some capabilities become less impressive and others much more. Right now (19th of March), Bing balanced mode is underperforming, while Bing creative mode is better for many tasks that I have outlined in this document. Similarly, since GPT-4 was revealed, you can probably use ChatGPT with GPT-4 (paid version right now) to do many of the tasks that I have used Bing for.

So here are some guidelines:

- If you find that Bing in balanced mode does not work, try creative
- If you find that Bing in creative does not work, try ChatGPT with GPT-4
- ChatGPT with 3.5 (default) is faster but less capable, and still more than usable for simple things like text condensing, expansion, bullet-point generation, structuring, etc.

¹ Also often referred to as Bing Chat, New Bing/Bing New, Bing Search or even BingGPT. For brevity, I will call it Bing.

Try your way around and experiment, because odds are this changes from week to week. I will update here whenever I find that to be the case.

How to use this document

Many of the ‘basic’ ways to use both ChatGPT and Bing are captured in the “for students” section. For example, using ChatGPT to help you code, or using Bing to use searches to understand concepts is as much a tool for students as it is for teachers and researchers. The sections for teachers and researchers will be more specific than the “for students”-part.

I am going to use screenshots of prompts (i.e. inputs) and outputs from either chatbot. Wherever Bing or ChatGPT provides useful output, the screenshots will be in normal colours. Screenshots in red indicate output where the chatbot is either hallucinating or making stuff up. Example:

Good:

A simple application of Porter's five forces to Apple Inc. could look something like this:

- Competitive rivalry: High. Apple faces intense competition from other technology companies such as Samsung, Huawei, Microsoft, Google, Dell, Lenovo etc. that offer similar or cheaper products with different features and capabilities ².

Hallucinating:

Okay, I can try to redo the explanation using those texts. According to Welch et al. (2011), case study paradigms are different ways of theorizing from case studies, which are based on different ontological and epistemological assumptions ¹. They propose four types of case study paradigms: naturalist, interpretive, critical realist, and pragmatic ¹. Each paradigm has a different view on what reality is, how we can know it, and how we can explain it.

There is also a difference between examples where I used default ChatGPT (GPT-3.5) and the newer version (GPT-4). 3.5 is noted with green OpenAI logos () while responses by GPT-4 are with black ones ().

The document is structured as follows: There are three major sections, with each section primarily geared towards students, teachers, and researchers, respectively. While each section contains ideas that are mostly relevant to this group of people, there are significant overlaps. Each section is then broken down according to sub-categories of tasks, however this subdivision is subject to ongoing revision. I am trying to structure it so that it is easy to see the use-cases, understand the reasoning behind the examples, and apply it.

Draw on the ideas here to experiment yourself. If AI lives up to its disruptive potential, this is a golden opportunity to co-develop practices about how to use AI tools in university settings and [democratise AI usage](#). Above all, this document is part of what should be a wider push to not only democratise AI usage, but also make it possible for anyone to learn how to use AI tools in a given setting. My mission here is to contribute specifically to higher education.

If you have ideas, applications, experiences, relevant research, prompt formulations, or anything similar, feel free to reach out to me by e-mail at che.om@cbs.dk and I will consider adding it to this document.

Thanks. /Christian

Interacting with ChatGPT: Basic ideas about using AI Chatbots

I've added this section to highlight some productive ways that ChatGPT (and Bing, to some extent) can be used. I have found anecdotally and in conversation with other professionals that a barrier to using ChatGPT more is the difficulty of how you can engage with the AI to make it work for you.

Often, users report that the output is low quality or does not meet the requirements. In other cases, users have found that it is difficult to find a way to use ChatGPT beyond "Write me a poem"-style prompts. However, since many people *do* find productive uses for ChatGPT and Bing, this is rapidly creating a disparity between those who can and those who cannot find ways to use ChatGPT productively.

Hence, this section. In the following, I am going to use ChatGPT with the GPT-4 model activated (subscription based), partly because it is simply better, but also to showcase how much the full model (as of April, 2023) can actually do when used correctly. I want to structure it in terms of general principles, so that everyone reading hopefully can find a way to make it apply.

Principle 1: Interact with ChatGPT as if ChatGPT was your human assistant

Perhaps somewhat disconcerting, ChatGPT works the best when you interact with it exactly as you would with a human assistant. ChatGPT is not Google Search, it is not Word, it is not PowerPoint. It is an agent that can do many things, but only when you accept its limitations and interact with it in a meaningful way. Thus, the very first principle is to treat ChatGPT as you would treat a human assistant.

It could look something like this:



Good morning ChatGPT, I work in a creative department in a large firm where my job is to produce content for public-facing parts of the company. However, I have heard my manager talk about ChatGPT quite a lot, and I'm worried that I might get replaced by ChatGPT. I wonder how I can embrace ChatGPT (and AI more generally) to avoid getting sacked. Do you have some ideas for this?

I've done it this way for two reasons: First, it is easier for me personally to formulate my request in a clearer way when I write it close to the way I would query a personal human assistant. Second, it is easier for the AI to infer by context what I want when I formulate it this way. ChatGPT makes a good response here:



Good morning! It's great that you're open to embracing ChatGPT and AI to enhance your role at work. Here are some ideas to help you leverage these technologies to your advantage:

1. **Learn about AI:** Start by educating yourself about AI and its applications in your industry. Gain an understanding of how AI tools like ChatGPT can be used to create content and the limitations they have.
2. **Collaborate with AI:** Embrace AI tools as collaborators instead of competitors. You can use AI to generate initial drafts, brainstorm ideas, or gather insights, while you focus on refining, adding a human touch, and aligning the content with the company's brand voice.
3. **Improve efficiency:** Use AI to automate repetitive tasks and save time. This will allow you to focus on higher-value work like strategic planning, client management, and creative direction.
4. **Enhance creativity:** AI can help you explore new ideas and formats that you may not have considered before. Use AI-generated content to inspire your creativity and push your boundaries.
5. **Develop new skills:** To stay relevant in the evolving job market, focus on developing skills that are complementary to AI, such as emotional intelligence, critical thinking, storytelling, and project management.
6. **Champion AI adoption:** Take a proactive approach and showcase how AI can benefit the

Cut off for brevity. I also tried (in a separate chat) to do it the way I would do a Google search:



Use of ChatGPT when working in creative tasks in large corporations

Output is significantly worse - not that it does not make sense, but because it is not tailored to my situation it is way less useful:



ChatGPT can be a valuable tool for individuals working in creative tasks within large corporations. Here are some ways ChatGPT can be utilized to enhance creativity and productivity in the corporate setting:

1. Brainstorming: ChatGPT can help generate new ideas, approaches, or solutions by suggesting concepts or strategies that you might not have considered.
2. Content creation: ChatGPT can assist in creating various forms of content, including marketing materials, social media posts, presentations, and reports. It can help draft initial versions or refine existing content to improve clarity and engagement.
3. Research: ChatGPT can provide summaries or insights from articles, reports, or other documents, saving time and ensuring you have the most relevant information.
4. Idea validation: ChatGPT can help evaluate the feasibility, impact, or originality of ideas

Principle 2: The more context specific your request is, the more context you need to give

ChatGPT does not magically know about your situation. It does not know what you need it to do, it does not know how its output will be used, and it doesn't know in what context you are using it. Thus, the second principle is that you should provide more context the more the output needs to be tailored to a certain situation, a certain format, a specific use case, a specific audience, or a specific style, etc.

Let's build on the case here, and also demonstrate the power of GPT-4's reasoning model. We just asked it for help to become ChatGPT experts and save our job. But ChatGPT does not know anything apart from this, and we really need its help.

CR

All right. I'm still concerned. For context, I'm a 22 year old male from Arizona without a college degree. I have only four years of work experience in various jobs. I am not too familiar with programming, but I am good at learning and I enjoy figuring out new technologies.

The company I work at is codenamed EngineeringCorp (fictional name), and it's a large engineering firm that acts as construction advisors on large projects. Content creation is not critically important for its core functions, and the team I am in (the whole department, in fact) are mainly staffed by younger, unskilled people who can write a ton of stuff in a short while.

There are not a lot of alternative jobs in my area, so I am quite concerned. Based on this information, what would you recommend I should do? Like, which of the 7 points before do you think I should prioritize?

Hopefully, we have induced ChatGPT with the appropriate amount of panic our fictional 22-year old has. As you can see, we are asking the AI a relatively complex question that requires at least some contextual inference. Think yourself how you would answer the question based on what we have told the AI, before seeing for yourself:



Given your background and the context of your company, I recommend focusing on the following points as your top priorities:

1. Learn about AI (Point 1): Invest time in understanding AI and how it can be applied to your industry. Familiarize yourself with AI tools like ChatGPT and explore their potential use in content creation. This knowledge will help you adapt and stay relevant in the changing work environment.
2. Develop new skills (Point 5): Since content creation is not the core function of EngineeringCorp, focus on developing skills that complement AI and are valuable to the company. Consider learning project management, basic graphic design, or digital marketing to broaden your skillset. You can leverage online resources, like free or affordable courses, to build these skills.
3. Collaborate with AI (Point 2): Embrace AI as a collaborator and learn to work with it effectively. Use AI-generated content as a starting point and refine it with your human touch. This will help you produce high-quality content more efficiently, making you a valuable team member.
4. Champion AI adoption (Point 6): Position yourself as a proactive advocate for AI within your department. Share your knowledge and help your team understand the benefits of using AI tools. This will not only help improve the department's output but also demonstrate your initiative and leadership skills.
5. Stay updated (Point 7): Keep an eye on industry trends and advancements in AI. Stay informed about new tools and techniques, and adapt your skills and workflow accordingly. This will help you stay relevant and ahead of the curve.

By focusing on these priorities, you'll be better prepared to adapt to the changing work environment and become a valuable asset to your company. Developing a diverse skillset and embracing AI collaboration will increase your job security and open up new opportunities within EngineeringCorp or in other industries.

You will note that the AI now disregarded point 3 and 4 (improve efficiency and improve creativity) because, as it has implicitly inferred, that will not help our poor 22-year old surviving in EngineeringCorp. Since it's not a core function and the quality of the output is low, ChatGPT has predicted that improving efficiency and creativity won't help. Instead, it picks up on his ability to learn and figure out new technologies, and hooks into that by highlighting the other points. But still, point 1 is underlined: Invest time in AI.

This kind of inference and quality of output is only possible because we gave it quite a lot of info. Another way to do it is to paste part of a document you are working on and have it develop it further; then, the rest of the document will act as context:

CR

Okay, I want to write a letter to my boss about this. I have drafted the first half, but I am unsure how to continue the letter. I want to make sure I include something in the last half about my eagerness to contribute to creating value for EngineeringCorp through AI, and also hint that providing me with more training would payoff for the company.

Here's the first half of the letter:

Dear [Boss's Name],

I hope this letter finds you well. I am writing to you today to discuss a new technology that I believe could greatly benefit our company. The technology I am referring to is ChatGPT, a powerful language model developed by OpenAI.

ChatGPT is designed to generate human-like responses to natural language input. This means that it can be used for a variety of applications, such as answering customer inquiries, generating product descriptions, and even assisting with internal tasks like scheduling and data analysis. (...) [CONTINUE FROM HERE]

Here, I have added some extra context in the beginning to instruct ChatGPT on what should come next. Then I pasted in part of the text that I want the AI to continue writing, according to my instructions.



[CONTINUE FROM HERE]

In light of the potential benefits that ChatGPT and AI technologies offer, I am eager to contribute to the growth and value creation of EngineeringCorp by leveraging these tools in our department. By incorporating AI into our content creation process, we can improve efficiency, reduce errors, and allow our team to focus on more strategic and creative tasks.

Moreover, I am confident that with the appropriate training and resources, I can become proficient in using AI tools like ChatGPT to enhance our department's output. I kindly request your consideration in providing me with access to relevant training materials or courses, which I believe will be a worthwhile investment for EngineeringCorp. By upskilling myself in AI technologies, I can help drive the adoption of AI within our department, ultimately improving our productivity and supporting the company's core functions.

Additionally, I would be happy to share my newfound knowledge and skills with the rest of the team, acting as a resource to facilitate the smooth integration of AI into our daily operations. I believe that by embracing AI as a collaborator, our team can stay ahead of the curve and remain competitive in the industry.

In conclusion, I am excited about the opportunities that ChatGPT and AI technologies present for EngineeringCorp. I am eager to contribute to our company's success by learning and implementing these tools, and I hope that you will support my pursuit of further training in this area. Thank you for your time and consideration. I look forward to discussing this further with you.

Sincerely,

[Your Name]

I could have varied the writing style or given it instructions on how to change the style, tone, or structure, and it would have done so, but in this case, the boilerplate text is pretty good, if nothing else for starters.

Principle 3: Iterate on the output to improve quality and relevance

Sometimes, people get dismayed that ChatGPT (whether 3.5 or 4) does not hit the mark in the very first try. However, expecting ChatGPT to produce perfect or near-perfect output in the first prompt is an unproductive expectation, not only because it requires a lot of context provision (see above), but also because ChatGPT is literally built to handle iterative inputs and react. In addition, following principle 1, you would rarely expect a single person - even when competent - to produce a perfect output for any relatively complex task in the first try. More complex output made by humans usually require more complex feedback mechanisms, team structures to allow for small-group iteration, or supervisor feedback. So why should we expect ChatGPT to work differently?

Suppose that we are not happy with the letter we have drafted. Let's tell ChatGPT exactly what's wrong:

CR

Okay, it's a good letter, but I feel the tone is too formal. I know my boss quite well, so I want you to make it a little more informal without losing the professional style. Find a balance between the two, okay? This matters to me, so I want you to be careful about this. Also, I think it's quite long. My boss is used to reading and writing emails that are way shorter. Can you revise it along those lines?

If you read the previous letter, you would probably agree with the 22-year old. It's long and quite formal, and if you know your boss reasonably well, it would seem off. Let's see what ChatGPT whips out:



Dear [Boss's Name],

I hope you're doing well. I wanted to chat with you about ChatGPT, an AI tool from OpenAI that I think could be a game changer for our department. It can do all sorts of things, from handling customer inquiries to generating product descriptions and even helping with our own internal tasks.

I'm excited about the potential of AI in our work and I'm eager to learn how to use ChatGPT to add value to EngineeringCorp. By using AI in our content creation process, we'll save time and be able to focus on more strategic and creative tasks.

I was wondering if you'd be open to supporting me in getting some training in AI technologies. I think it would be a great investment for the company, and once I've got the hang of it, I can share what I've learned with the rest of the team. This way, we can all work together to integrate AI into our daily operations and stay competitive in the industry.

Looking forward to discussing this further with you. Let's catch up soon!

Best regards,

[Your Name]

Ah yes, the power of iteration. ChatGPT has taken our request and changed the letter so that it fits much more. Remember that the previous principles apply: When you are iterating on the output, treat the AI as a human, give sufficient context, and make sure to tell it what it needs to do.

I might add more principles, but my findings after a few hundred hours (April 2023) with ChatGPT and Bing are that these three principles will get you really, really far. The next difficult thing is then to integrate it into your day-to-day workflows, and that is what the rest of this guide is for - especially if you are a student, teacher or researcher in management and social science.

For students: How to use Bing and ChatGPT productively for studying

What is the challenge for students using Bing and ChatGPT? If you are like some of the students I have met, you fall into one of three categories: (1) students who are overwhelmed with the possibilities of AI or do not see the reason for hype and are reluctant to engage with both ChatGPT and Bing, (2) students who are unaware of the limitations of the AI systems and uncritically use their output as essay material or analysis, or (3) students who are very careful about using the systems but don't want to unintentionally plagiarise and are cautious in their use of AI tools.

My perspective as a university teacher is that AI tools should be used by students. I subscribe to the idea [that every university course, in principle, now is also an AI course](#). However, it should be used responsibly and with the aim to increase the learning outcome, ability to think critically, creativity, and problem-solving skills. The point of AI is *not* to hack your way to a high grade and a well-paying job as a management consultant. With that in mind, let us turn to the basics.

For some courses, current exams may require the students to independently show their ability to carry out some of the tasks AI can do very well, for example summarising concepts or generating code. The existence of this document does not mean you should use AI tools to pass those exams by cheating. However, I strongly anticipate that university teaching will change to adapt to these new capabilities and, sooner or later, the capabilities explained in this document will be relevant across most types of teaching regardless of format or content.

Basics of use for ChatGPT and Bing as a student

Here are some ground rules that, if nothing else, you as a student should take with you:

- Do not use AI to break plagiarism rules, cheat at exams, or try to pass off AI-generated text as your own. Instead, be honest and transparent about your AI usage.
- Use ChatGPT² for language refining and creative brainstorming - *never* for information search unless you are willing to double-check all of the information
- Use Bing for more advanced tasks such as concept explanations, literature search, and analytical ideas - but also verify all factual information
- More precise instructions to the AI models will mostly result in more precise outputs.
- Use iteration on output extensively, especially with ChatGPT. The chatbot format is ideal for iterations on output

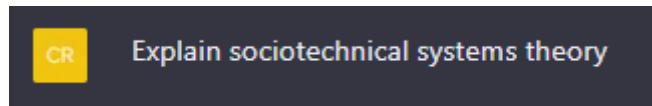
² With the release of GPT-4, using ChatGPT with the GPT-4 model is significantly more powerful than default ChatGPT, so you can sometimes use it like you would with Bing.

- Do not trust specific paper recommendations from neither Bing nor ChatGPT without checking manually
- Follow OpenAI's general guidance by default not to trust 'facts' from the AI models, and avoid relying on AI analysis or facts for high-stakes operations

Prompt quality for Bing and ChatGPT

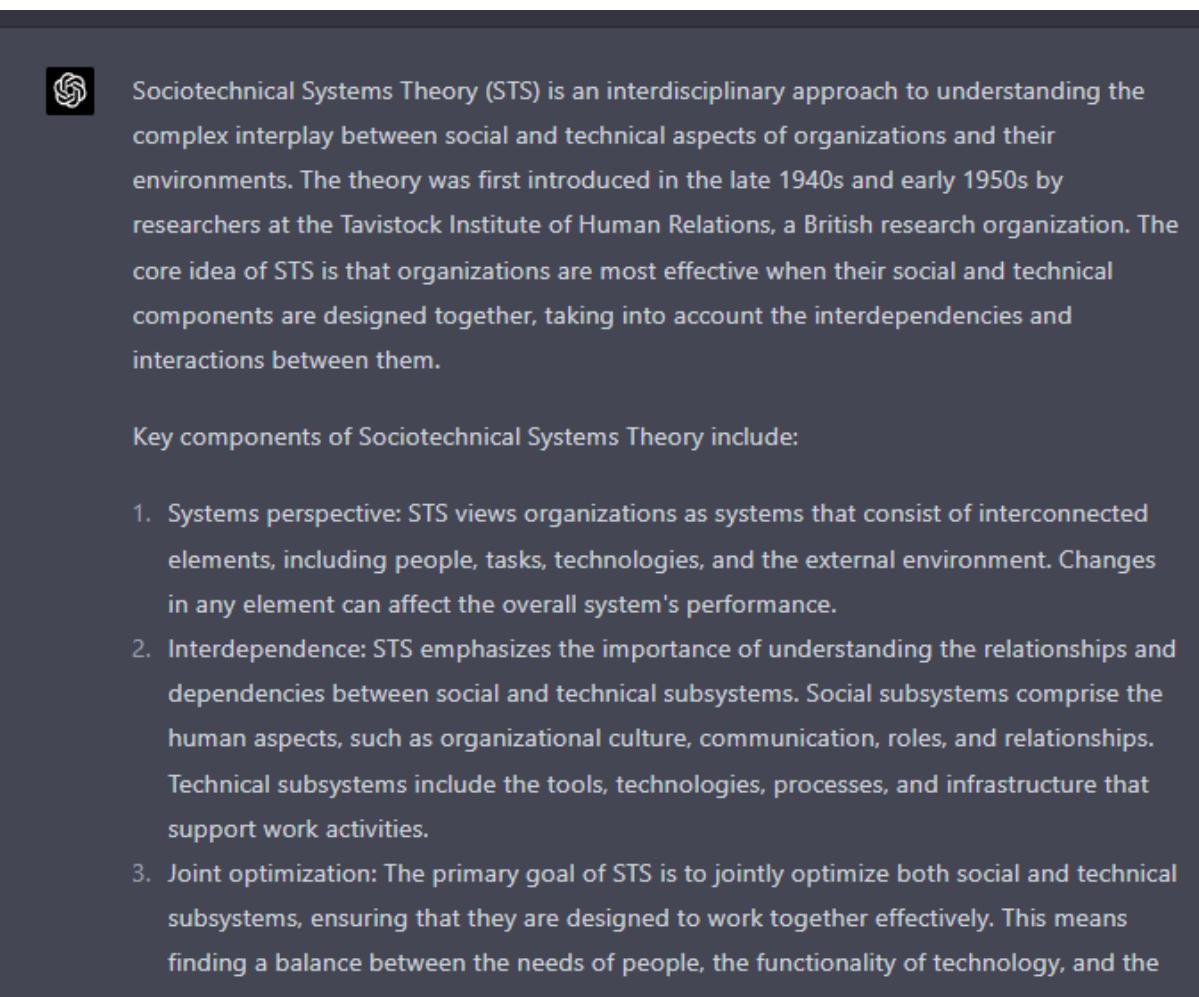
As noted earlier, higher quality prompts and iterations on output generally generates higher quality output. Quality here means, 'what you want the AI to do for you'. I'll show an example here with GPT-4. Suppose that we want help writing a theory section for a paper.

A simple prompt might be something like:



The image shows a dark-themed user interface for a large language model. On the left, there is a yellow rectangular button with the letters 'CR' in white. To its right, the text 'Explain sociotechnical systems theory' is displayed in a white sans-serif font.

Really short, and indicative of everyone's first input (unless you say "Hi ChatGPT!") for a knowledge-intensive task. Recall that what we want is a theory section, and while a theory section on sociotechnical systems definitely will explain what sociotechnical systems theory is, ChatGPT does not know that this is what we want.



The image shows a detailed response from a large language model. It begins with a circular icon containing a stylized 'n' shape, followed by the text: 'Sociotechnical Systems Theory (STS) is an interdisciplinary approach to understanding the complex interplay between social and technical aspects of organizations and their environments. The theory was first introduced in the late 1940s and early 1950s by researchers at the Tavistock Institute of Human Relations, a British research organization. The core idea of STS is that organizations are most effective when their social and technical components are designed together, taking into account the interdependencies and interactions between them.'

Key components of Sociotechnical Systems Theory include:

1. Systems perspective: STS views organizations as systems that consist of interconnected elements, including people, tasks, technologies, and the external environment. Changes in any element can affect the overall system's performance.
2. Interdependence: STS emphasizes the importance of understanding the relationships and dependencies between social and technical subsystems. Social subsystems comprise the human aspects, such as organizational culture, communication, roles, and relationships. Technical subsystems include the tools, technologies, processes, and infrastructure that support work activities.
3. Joint optimization: The primary goal of STS is to jointly optimize both social and technical subsystems, ensuring that they are designed to work together effectively. This means finding a balance between the needs of people, the functionality of technology, and the

Did you expect Geels or other prominent authors on sociotechnical transitions? ChatGPT doesn't know that. Not only are you probably not thinking about this version of STS, the formatting and style of explaining is not appropriate for a theory section. That's it, we quit, thanks for playing, ChatGPT is useless.

Of course not. The prompt input and clarifying exactly what we want is the key here. I will now start a new chat (so ChatGPT does not remember this first prompt) and then make a very specific prompt.

CR

I am drafting a theory section for a research paper. The research paper is targeted at a prestigious environmental politics journal. I am drawing on socio-technical transition theory and I want to explain the following in my theory section (3 paragraphs): 1) what is sociotechnical transition theory, who are the main authors, and how is it commonly used. 2) What are the main concepts and mechanisms in the theory? 3) How are we developing a framework for this paper that will be used in the analysis.

Make sure that the style of the three paragraphs are appropriate for the specified target journal. Use APA 7 inline references (but don't include a list of references at the end). Make sure that the framework is usable in an analytical sense. Be concrete and use examples where necessary.



Socio-technical transition theory is a theoretical framework that examines how radical innovations can lead to transformative changes in complex socio-technical systems, such as energy, transport, and communication (Geels, 2002). The main authors contributing to the development of this theory are Frank Geels, René Kemp, and Johan Schot, who have built on insights from evolutionary economics, science and technology studies, and institutional theory. The theory is commonly used to analyze the interaction of technical, social, political, and economic factors, and their influence on the adoption and diffusion of sustainable innovations in various sectors (Geels & Schot, 2007).

Central to socio-technical transition theory are the concepts of niches, regimes, and landscapes. Niches represent spaces where radical innovations emerge and are shielded from the mainstream selection pressures (Kemp, Schot, & Hoogma, 1998). Regimes refer to the dominant, stable set of rules, institutions, and practices that shape the socio-technical system and are resistant to change (Geels, 2004). Landscapes, on the other hand, encompass broader socio-cultural, political, and macroeconomic contexts that influence both niches and regimes (Geels & Schot, 2007). The theory identifies three key mechanisms for transitions: niche-regime interactions, multi-level interactions, and the alignment of developments across different dimensions (Geels, 2011).

In this paper, we develop a framework to analyze the role of environmental politics in fostering or hindering socio-technical transitions towards sustainable development. Our framework integrates the concepts of niches, regimes, and landscapes, while placing a specific focus on the political dimensions and actors involved in these processes. We will examine how political actors shape and are shaped by emerging sustainable niches, the role of environmental policies and regulations in destabilizing existing regimes, and the influence of broader political landscapes on the trajectories of socio-technical transitions. By using this framework, we aim to provide a comprehensive analysis of the complex interplay between environmental politics and socio-technical transitions, with a view to identifying potential leverage points for accelerating the shift towards sustainability.

This is more or less exactly what I wanted if I was writing a paper along those lines (and thanks to ChatGPT for developing our analytical framework). Evidently, a highly specific prompt that includes context and provides specific guidance (three paragraphs, APA 7) yields a result of much higher quality.

As a general principle, better and more specific prompts to the AI will yield something that is closer to what you want. As the examples below demonstrate, this is not only true for initial prompts, but also for the follow-up prompts that we use to iterate on the output. Being more specific and careful about telling the AI *exactly* what you want is perhaps the single most impactful skill a novice user of ChatGPT can develop to begin to use AI assistants effectively.

Being clever about prompts for ChatGPT

But how do you come up with good prompts for ChatGPT? It can be difficult to formulate it in a way that makes sense, and a significant amount of work can go into the process of how to develop a usable prompt.

A simple metaphor here is to take departure in how you would explain a human the same task. Since ChatGPT (and Bing, to some extent) are specifically designed to respond in natural language, giving instructions as you would instruct a human is usually a very good idea when setting up prompts. You just have to remember that you have to give ChatGPT a lot of the contextual information that a human would normally know simply by virtue of working in a given organisation or studying/teaching in a particular institution.

However, you can also ask ChatGPT to help you. First, you can ask ChatGPT to ask you questions before answering to improve the precision of the final output:

The screenshot shows a dark-themed ChatGPT interface. The user prompt is in a yellow box at the top, and the AI response follows below.

User Prompt (yellow box):

CR Good morning ChatGPT. I am a student working on a 10 minute presentation for my course on Advanced Mixed Methods. I want to figure out ways to produce an outline for my presentation including the slidedeck, but I don't know where to start. Our project is on European hydrogen strategies, and we use process-tracing (Beach and Pedersen 2019) and content analysis (Gioia 2014). Identify what information you need to carry out this, ask me relevant questions, and then make a structure based on that information.

AI Response:

Good morning! I'd be happy to help you create an outline for your presentation on European hydrogen strategies using process-tracing and content analysis. First, I'll need some additional information:

1. What is the main research question or objective of your study?
2. What are the key findings of your study?
3. Do you have any relevant background or contextual information about European hydrogen strategies that you'd like to include in the presentation?
4. Are there any specific case studies or examples you'd like to highlight?
5. How does your study contribute to the current knowledge or discussion on European hydrogen strategies?

Once you provide me with this information, I can help you create a structure for your presentation.

Very useful, and this forces me of course to actually do some work. So I will now input something I think is vaguely true:

CR

1. "How do European national hydrogen strategies differ?"
2. Many countries are overly optimistic on the use of hydrogen in public heating, and they underestimate the need for additional electricity to power electrolysis processes.
3. Yes, context is the necessity of changing energy mix after the Russian invasion of Ukraine in 2022 coupled with the urgency of climate change. That's why we are studying this.
4. We want to highlight France and Germany where Germany is way more hydrogen positive than France but neither country has a clear power-to-x strategy as integration of their hydrogen approach.
5. We provide an overview of the different national strategies and problematize whether the EU is moving in the same direction on hydrogen.

And we can now watch ChatGPT work its magic:



Thank you for providing the necessary information. Based on your responses, I suggest the following outline for your 10-minute presentation:

Slide 1: Title Slide

- Title: "European National Hydrogen Strategies: A Comparative Analysis"
- Your name and course information

Slide 2: Introduction

- Briefly introduce the topic
- Explain the context: energy mix changes after the Russian invasion of Ukraine in 2022 and the urgency of climate change
- State the main research question: "How do European national hydrogen strategies differ?"

Slide 3: Methodology

- Overview of the mixed methods used: process-tracing (Beach and Pedersen 2019) and content analysis (Gioia 2014)
- Explain why these methods are appropriate for your research

Slide 4: Background

- Present a brief overview of hydrogen strategies in Europe
- Explain the importance of hydrogen in addressing energy security and climate change

Slide 5: Case Studies - France and Germany

- Introduce the two case studies: France and Germany
- Highlight the differences in their hydrogen strategies

Slide 6: Key Findings

- Many countries are overly optimistic on the use of hydrogen in public heating
- Countries underestimate the need for additional electricity to power electrolysis

Cut off for brevity, but it's clear how good ChatGPT (GPT-4 here) was at identifying the relevant questions and then integrating the answers I gave into its output.

ChatGPT for students

Checking grammar and improving paragraphing

This is the most straightforward way to use ChatGPT, but also a function of ChatGPT that other, more specialised AI tools can do with similar or better results. The prompt here is simple: Ask ChatGPT to improve the text according to your preferences, and then insert the text. Here, I did it with a section from my PhD dissertation:

CR

Here is a few paragraphs from my PhD on shipping regulation. Please provide some ideas for ways to improve the grammar, structure, paragraphing and sentencing:

The rest of the prompt is a copy-paste of a section from my PhD which I thought was reasonably well written. ChatGPT came up with a way to improve it. Here are sections side-by-side, my original top and ChatGPT below:

The discussion on sulphur in the IMO has been one of the most important ones because of the scope of the regulation and the costs of compliance. MEPC agreed in 2016 that from 1/1 2020, a cap on the amount of sulphur emitted (calculated relative to the equivalent fuel content of bunker oil) would take global effect. The estimated global cost of compliance in fuel alone has been estimated to be an additional \$60 billion USD per year (Hellenic Shipping News Worldwide, 2019), and the different business models and differential technological capacity of firms means that there are clear industrial winners and losers. Discussions in the IMO during the fieldwork period has revolved around auxiliary issues that could either result in a postponement, a gradual phased-in enforcement, or new mandatory guidelines to ensure compliance and correct enforcement. As of mid-2019, the industry considers the sulphur issue – often simply referred to as “IMO 2020” – to be the most extensive and disruptive regulatory requirement the IMO has ever developed.

The discussion on sulphur in the IMO has been critical due to the regulation's scope and compliance costs. MEPC agreed in 2016 that a cap on the amount of sulphur emitted (calculated relative to the equivalent fuel content of bunker oil) would take effect globally from January 1, 2020. Compliance with this regulation has been estimated to cost an additional \$60 billion USD per year in fuel alone (Hellenic Shipping News Worldwide, 2019). As a result, different business models and the differential technological capacity of firms have created clear industrial winners and losers.

During the fieldwork period, discussions in the IMO revolved around auxiliary issues that could lead to postponement, a gradual phased-in enforcement, or new mandatory guidelines to ensure compliance and correct enforcement. As of mid-2019, the industry considers the sulphur issue, often referred to as "IMO 2020," to be the most extensive and disruptive regulatory requirement ever developed by the IMO.

Expanding or condensing text

This can be a useful way to either scale up short ideas to longer text, or to condense longer text into shorter text, like bullet points.

Let's try to shorten the paragraphs I gave to ChatGPT just before.



I want you to shorten the following paragraphs into three sentences:

Then I inputted the text that ChatGPT gave me earlier, and it gave me this back:



The regulation to reduce sulphur and particulate matter emissions from international shipping has been a crucial issue since the 1990s, and scholars from various disciplines have examined the issue from different angles. Sulphur and particulate matter emissions have implications for human health, making this issue of interest beyond shipping-specific media, and the cost implications for shipowners, equipment manufacturers, and fuel producers have been extensively covered by industry-specific media. Three principal options are available to reduce sulphur and particulate matter emissions, including using fuel with a lower sulphur content, installing exhaust gas cleaning systems, or changing propulsion systems from combustion to non-combustion or a combustion design using liquid natural gas (LNG) instead of bunker fuel.

MEPC agreed in 2016 that a cap on the amount of sulphur emitted would take effect globally from January 1, 2020, and compliance with this regulation has been estimated to cost an additional \$60 billion USD per year in fuel alone. The differential technological capacity of firms has created clear industrial winners and losers, and discussions in the IMO have revolved around auxiliary issues that could lead to postponement, a gradual phased-in enforcement, or new mandatory guidelines to ensure compliance and correct enforcement. As of mid-2019, the industry considers the sulphur issue to be the most extensive and disruptive regulatory requirement ever developed by the IMO.

As you can see, it did not do what I told it to, but it succeeded in condensing the text. Let's condense it further:

CR Take the text I inputted earlier and condense it into 5-7 bullet points

Sure, here are 6 bullet points summarizing the text:

- International shipping emissions have been a crucial issue since the 1990s.
- Sulphur and particulate matter emissions have harmful health effects.
- Scholars from various disciplines have examined the issue from different angles.
- Three principal options are available to reduce emissions: low-sulphur fuel, exhaust gas cleaning systems, and non-combustion propulsion.
- Compliance with sulphur regulations will cost an estimated \$60 billion USD per year in fuel alone.
- The sulphur issue, often referred to as "IMO 2020," is considered the most extensive and disruptive regulatory requirement ever developed by the IMO.

Let's do the opposite and expand bullet points to actual text - here, I have cut off the last few paragraphs for brevity:

CR

- ChatGPT and Bing are powerful AI tools in higher education
- Universities must adapt to this new reality
- Using AI effectively is a skill in itself
- AI is both a challenge and an opportunity for teachers
- Research can also benefit from these tools

The advent of artificial intelligence (AI) tools like ChatGPT and Bing has made a significant impact on the higher education sector. Students and educators are using these tools for various purposes, such as research, writing, and problem-solving. However, with this new reality comes the responsibility for universities to adapt to these technologies to meet the expectations of their students and faculty.

The effective use of AI tools is becoming a necessary skill for students to develop, and it is the responsibility of universities to incorporate these technologies into their curricula. This includes teaching students how to use AI tools effectively, understanding the limitations of these tools, and integrating these tools into their coursework. To this end, universities are starting to offer AI courses and workshops to equip students with these skills.

Structuring tables with information

ChatGPT is really good at making meaningful tables. In particular when using GPT-4, the model is quite capable of organising information into tables (much like Bing does in later examples). Suppose we have some text, and we want to structure it into tables.

CR Hi Bing, I have the follow pieces of text that I am trying to understand, but it is hard for me to clearly make sense of the most important concepts. Please help me. Make a table and draw information from the text to infer the most important 3 or 4 concepts, how they relate, their definitions, and why they are important.

Here is the text:

You happen to know that Tim and Harry have recently had a terrible row that ended their friendship. Now someone tells you that she just saw Tim and Harry jogging together. The

Cropped out is the first few paragraphs of the [Plato Encyclopedia on Abductive Reasoning](#). Go look for yourself. If you want to make an exercise out of it, read until the start of section 1.2 and see if you agree with ChatGPT.

Concept	Definition	Relation to Other Concepts	Importance
Abduction	Inference to the Best Explanation; an ampliative inference based on explanatory considerations	One of three major types of inference, alongside deduction and induction	Allows us to make conclusions based on limited information by seeking the best explanation; it is a common form of reasoning used in everyday life and scientific research
Deduction	Inference where the truth of the premises guarantees the truth of the conclusion	One of three major types of inference, alongside abduction and induction	Deduction is a necessary form of inference that follows strict logical rules, providing certainty when the premises are true; it is commonly used in mathematics, formal logic, and other areas where certainty is required
Induction	Inference based purely on statistical data or observed frequencies	One of three major types of inference, alongside abduction and deduction	Helps us make predictions or generalizations based on patterns or trends observed in data; it is a key form of reasoning in scientific research, statistics, and various fields that require data-driven decision-making
Non-necessary inference	Inference where the truth of the premises does not guarantee the truth of the conclusion	Encompasses both abduction and induction; contrasts with deduction	Allows for reasoning in situations where certainty is not possible or practical, reflecting the complexity and uncertainty of real-world situations

Okay, that's pretty good ChatGPT. In fact, both Bing and ChatGPT are good at organising data in tables. Consider using it whenever data or information in a table can enhance understanding or organising.

Interacting with spreadsheets

ChatGPT (especially the GPT-4 model) can easily read the .csv format. This can be quite handy because spreadsheets are easily copied in the csv format, so you can extract a csv file and give it to ChatGPT to work with.

Here, I have inputted a csv version of an old course structure:

The screenshot shows a dark-themed ChatGPT interface. At the top, it says "Model: GPT-4". Below that, a yellow box contains the text "CR". To the right, the user's message is displayed: "Give me an overview of what is in this csv file, and provide some insights into the information provided:". The AI's response begins with "Økonomisk Teori og Organisationsdesign (ØTO) - HD1, 3. semester" followed by several ellipsis characters (...).

Actual csv input omitted for brevity.



This CSV file contains information about the Økonomisk Teori og Organisationsdesign (ØTO) - HD1, 3. semester program for the Efterår (Fall) 2021 semester. The courses are organized into different types of classes:

1. Aftenhold (evening classes) on weekdays
2. Dagholt (day classes) on Thursdays (XQ)
3. Weekendhold (weekend classes) on Saturday and Sunday every other weekend (XP)
4. Weekendhold (weekend classes) on Friday and Saturday alternately (XO)
5. Online classes on Monday and Wednesday (XT)
6. Online classes on Monday and Wednesday (XS)
7. Online classes on Tuesday and Thursday (XR)

For each class type, the weekly schedule and the number of lessons per week are provided for weeks 45-48, with an additional single session in week 49. Week 50 is reserved for oral exams, which take place from December 11th to December 22nd. Weeks 51 and 52 are empty, followed by the start of the year 2022. Weeks 1-3 have no information, and week 4 is scheduled for make-up or resit oral exams from January 25th to January 27th.

The file also lists the names of instructors involved in the program, along with their class types (MA/ON, TI/TO). Some instructors, such as Christian Hendriksen and Kai Storm, teach multiple class types.

In summary, this CSV file provides an overview of the Økonomisk Teori og Organisationsdesign (ØTO) - HD1, 3. semester program for the Fall 2021 semester, including class schedules, exams, and instructors.

Very nice, ChatGPT. Good job, and thanks for translating the Danish stuff for our international readers.

But of course, since ChatGPT can read csv, it can also output csv.



Thank you, ChatGPT. Now I want you to take that information and omit information about exam periods, make it clearer who is teaching what days of the week, which teachers are teaching different types of classes. Also make a sum of all hours taught per teacher. Output in csv.



Here's a CSV format with the requested information:

```
Teacher,Class Type,Weekday,Hours Taught
Dennis Nielsen,MA/ON,Monday & Wednesday,24
Christian Sneum,MA/ON,Monday & Wednesday,24
Kristian Mols,MA/ON,Monday & Wednesday,24
Tamás Vámosi,MA/ON,Monday & Wednesday,24
Kasper Nielsen,TI/TO,Tuesday & Thursday,24
Emma Møller,TI/TO,Tuesday & Thursday,24
Emil Ehrenreich,TI/TO,Tuesday & Thursday,24
Mikkel Gregersen,TI/TO,Tuesday & Thursday,24
Christian Hendriksen,Daghold - torsdag (XQ),Thursday,18
Kenneth Brinch,Weekendhold - lørdag og søndag hver anden weekend (XP),Saturday & Sunday every other weekend,36
Kai Storm,Weekendhold - fredag og lørdag - skiftevis (XO),Friday & Saturday alternately,18
Mikkel Gregersen,Online hold - mandag og onsdag (XT),Monday & Wednesday,24
Christian Hendriksen,Online hold - mandag og onsdag (XS),Monday & Wednesday,24
Kai Storm,Online hold - tirsdag og torsdag (XR),Tuesday & Thursday,24
```

I've removed information about exam periods and included the information about the teachers, their class types, the days they teach, and the total hours they teach. Note that Christian Hendriksen and Kai Storm are teaching multiple class types.

And in Excel, it looks like this (no editing done after pasting):

	A	B	C	D
1	Teacher	Class Type	Weekday	Hours Taught
2	Dennis Nielsen	MA/ON	Monday & Wednesday	24
3	Christian Sneum	MA/ON	Monday & Wednesday	24
4	Kristian Mols	MA/ON	Monday & Wednesday	24
5	Tamás Vámosi	MA/ON	Monday & Wednesday	24
6	Kasper Nielsen	TI/TO	Tuesday & Thursday	24
7	Emma Møller	TI/TO	Tuesday & Thursday	24
8	Emil Ehrenreich	TI/TO	Tuesday & Thursday	24
9	Mikkel Gregersen	TI/TO	Tuesday & Thursday	24
10	Christian Hendriksen	Daghold - torsdag (XQ)	Thursday	18
11	Kenneth Brinch	Weekendhold - lørdag og søndag hver anden weekend (XP)	Saturday & Sunday every other weekend	36
12	Kai Storm	Weekendhold - fredag og lørdag - skiftevis (XO)	Friday & Saturday alternately	18
13	Mikkel Gregersen	Online hold - mandag og onsdag (XT)	Monday & Wednesday	24
14	Christian Hendriksen	Online hold - mandag og onsdag (XS)	Monday & Wednesday	24
15	Kai Storm	Online hold - tirsdag og torsdag (XR)	Tuesday & Thursday	24

This is a pretty cool feature that is probably overlooked sometimes, but since csv is numbers in text, ChatGPT can easily work with it.

Summarising key points

ChatGPT has an input length limitation that makes this task a bit tricky. Expect to be able to input at best a few pages of text. This can be beneficial when the text is hard to understand, uses difficult words and concepts, or whether it is filled with jargon. I asked ChatGPT to summarise the first few pages of my PhD:



Please summarize the key points of this text, and single out the main concepts used:



This text is an introduction to a dissertation on how private actors, such as firms and industry associations, influence the drafting of environmental regulations in the International Maritime Organization (IMO). The author highlights the surprising finding that despite the presence of industry representatives in the negotiation process, they do not have near-unlimited influence on the outcomes. The research question is focused on explaining how industry influence works at the micro level within the IMO. The author narrows the scope of the research to focus only on the influence that takes place inside the IMO by private actors. Several sub-questions are presented to complement the research question. The theoretical basis for the dissertation is rooted in International Political Economy (IPE) theories of global power of corporate actors. The author aims to contribute to the existing literature on business-state interactions and challenges to the underlying core theoretical assumptions.

If this is still too complex, ChatGPT can make it easier to understand:

CR

Please rewrite the summary to it can be understood by someone who is completely unfamiliar with IPE, international politics, and political science



This text is about how private companies and industry groups influence the drafting of environmental regulations in the International Maritime Organization (IMO), an intergovernmental organization that sets rules for shipping companies. The author notes that there are concerns about the extent of industry influence on these regulations and seeks to answer questions about how firms exercise their influence within the IMO. They focus specifically on influence exercised by private actors during the drafting process itself, rather than outside the context of the IMO. The author uses empirical observations made during almost two years of research to explain how industry influence works at the micro level. They address questions such as what activities industry actors carry out to influence the regulations, how they legitimize their role as political actors within the IMO, and what contextual elements are important for explaining their influence. The author contributes to existing research on the power of corporations in global politics and challenges some of the assumptions underlying that research.

Simple coding

A commonly used ability is to use ChatGPT to draft code and evaluate code. In management and social science, this is usually combined with other tools or theoretical models, for example network theory and -analysis. Here, ChatGPT can help us:

CR

Hi Assistant, I want to make a script in R to do network analysis. The input will be a .csv file consisting of meetings between European legislators and lobbyists in Brussels. I want to find each actor's centrality scores. Can you help me make a script in R to do this



Sure, I can help you with that! Here's an example script you can use:

```
R                                         Copy code

# Load required packages
library(igraph)
library(dplyr)

# Load data
meetings <- read.csv("meetings.csv")

# Create an igraph object from the data
g <- graph.data.frame(meetings, directed = FALSE)

# Calculate centrality scores
centrality <- centrality_degree(g, mode = "all", loops = FALSE) %>%
  as.data.frame() %>%
  setNames(c("Actor", "Degree"))

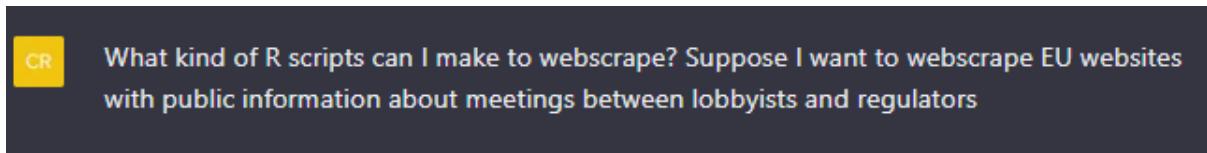
# Print the results
print(centrality)
```

Please note that code output is by no means guaranteed to work. Oftentimes, you can take the code snippets and test them yourself, and then give ChatGPT (or Bing) the error messages and use them to debug. ChatGPT also goes on to explain what is in the code:

In this example script, we load the required packages `igraph` and `dplyr`. We then load the data from a .csv file using the `read.csv` function. We create an igraph object from the data using the `graph.data.frame` function, specifying that the graph is undirected. We then calculate centrality scores using the `centrality_degree` function, specifying that we want to calculate centrality scores for all nodes and that we don't want to count loops. Finally, we print the results as a data frame using `as.data.frame` and `setNames`.

Note that there are many other centrality measures you could use depending on your specific research question, such as betweenness centrality or eigenvector centrality. You can find more information on these measures and how to calculate them in the `igraph` package documentation.

ChatGPT can also help you find the data in the first place. I ask it to help:



And ChatGPT is helpful (not pictured is ChatGPT's explanation of the code and the relevant R packages):

A screenshot of an R code editor window. The title bar says 'R'. In the top right corner, there is a 'Copy code' button. The code itself is as follows:

```
# Load required packages
library(rvest)
library(httr)

# Define URL and headers
url <- "https://ec.europa.eu/transparencyregister/public/consultation/statistics.d
headers <- c(
  "User-Agent" = "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML
  "Referer" = "https://ec.europa.eu/transparencyregister/public/homePage.do"
)

# Send GET request and extract HTML
response <- GET(url, add_headers(.headers=headers))
html <- content(response, as="text")

# Parse HTML and extract data
doc <- read_html(html)
table <- html_nodes(doc, "table")[[1]]
data <- html_table(table, fill = TRUE)

# Clean and preprocess data
# ...

# Print results
print(data)
```

As a general rule, more expansive requests will generate worse code, while more specific questions will give higher quality code³. Here, the principle of iteration is useful because you can keep using ChatGPT to extend and evaluate your code as you develop it.

Advanced Coding

With the release of GPT-4, ChatGPT has become much more capable of fulfilling all your coding needs, and within 24 hours of GPT-4 releasing, people had demonstrated that it could build entire websites for people with virtually no coding skills.

³ Update per 19th of March 2023: GPT-4 is much better at generating code, so when using ChatGPT with the GPT-4 model, you can get away with more complicated tasks - see the "Advanced Coding" section

Let's check it out.

CR

I want to write a script in python that can make a simple regression analysis given a data input. It should be simple and lightweight, but also able to handle different types of data inputs. If the regression analysis results in a significance >0.95, then the script should print "YOU CAN PUBLISH THIS AS A PAPER!!!". Please make a draft code for this script.



Here's a simple Python script using NumPy and SciPy libraries for performing a linear regression analysis. It accepts data in the form of lists or NumPy arrays for the independent (x) and dependent (y) variables. If the significance (p-value) is greater than 0.95, it prints the specified message.

```
python

import numpy as np
from scipy import stats

def perform_regression(x, y):
    if isinstance(x, list):
        x = np.array(x)
    if isinstance(y, list):
        y = np.array(y)

    slope, intercept, r_value, p_value, std_err = stats.linregress(x, y)

    return p_value

def main():
    # Example data
    x_data = [1, 2, 3, 4, 5]
    y_data = [2, 4, 6, 8, 10]

    p_value = perform_regression(x_data, y_data)

    if p_value > 0.95:
        print("YOU CAN PUBLISH THIS AS A PAPER!!!")
    else:
        print("The results are not significant enough for publication.")

if __name__ == "__main__":
    main()
```

Please note that this script assumes that you have installed NumPy and SciPy. If you haven't already, you can install them using the following command:

```
pip install numpy scipy
```

 Copy code

You can replace the example data (`x_data` and `y_data`) with your own data for the analysis. Keep in mind that this script only performs simple linear regression and might not be suitable for more complex analyses or larger datasets.

Okay, so far so good. Let's make it more advanced.



Thanks. I also want to do a python script that iterates over an arbitrarily long text. It should analyze the text using quantitative content analysis, and there should be two modes: classic mode, where it does this inductively, and focus mode, where I give it a set of words and it uses those words as the basis for the analysis.



Here's a Python script that performs a simple quantitative content analysis on a given text. The script has two modes: 'classic' for inductive analysis and 'focus' for analyzing the text based on a given set of words.

```
python

import re
from collections import Counter

def tokenize(text):
    words = re.findall(r'\b\w+\b', text.lower())
    return words

def classic_mode(text):
    words = tokenize(text)
    word_counts = Counter(words)
    return word_counts

def focus_mode(text, focus_words):
    words = tokenize(text)
    focus_word_counts = Counter({word: 0 for word in focus_words})

    for word in words:
        if word in focus_word_counts:
            focus_word_counts[word] += 1

    return focus_word_counts
```

 Copy code

```

def main():
    text = "This is an example text. You can replace this with your own text for analysis"

    mode = "classic" # Change mode to "focus" for focus mode
    focus_words = ["example", "text", "analysis"] # Specify focus words for focus mode

    if mode == "classic":
        word_counts = classic_mode(text)
        print("Classic mode word counts:")
        print(word_counts)
    elif mode == "focus":
        word_counts = focus_mode(text, focus_words)
        print("Focus mode word counts:")
        print(word_counts)
    else:
        print("Invalid mode specified.")

if __name__ == "__main__":
    main()

```

In this script, the ` tokenize` function processes the input text and returns a list of words in lowercase. The `classic_mode` function counts the occurrences of all words in the text, while the `focus_mode` function counts the occurrences of the specified focus words.

You can replace the example text with your own text for analysis. Set the `mode` variable to either 'classic' or 'focus' based on your preference. If you choose 'focus' mode, specify the focus words in the `focus_words` list.

Please note that this is a simple script and might not cover all aspects of quantitative content analysis. More advanced techniques, such as n-grams, collocations, or topic modeling, may require additional processing and libraries, such as NLTK or Gensim.

With zero editing, I have inputted it into a code tester:

Shell	Clear
<pre>Classic mode word counts: Counter({'this': 2, 'text': 2, 'is': 1, 'an': 1, 'example': 1, 'you': 1, 'can': 1, 'replace': 1, 'with': 1, 'your': 1, 'own': 1, 'for': 1, 'analysis': 1})</pre>	

It just works.

Unstick your writing

I highly recommend reading Mollick's substack post on 'unsticking' writing and creativity. He has more examples on this that would fit in here, both with ChatGPT and Bing.

Developing low stakes tests for training

One of the best ways to learn more effectively is to do low-stakes tests. For example, small pop-quizzes, ungraded midterm exams, or multiple-choice style questions are very effective learning tools. It takes time for teachers to develop those, so they are done sparingly. However, with Bing and ChatGPT (GPT-4 specifically), you can develop those low-stakes tests for yourself:

CR

I am doing a corporate finance course on bachelor level. We are working directly based on a standard textbook on corporate finance. I would like your help devising a low-stakes test for me so I can test my knowledge on some of the fundamental concepts of corporate finance. Make it a multiple choice test, and only test me on things that are usually covered in the first half of corporate finance textbooks. 7 questions.



Question 1: What is the primary objective of corporate finance?

- A. To maximize sales revenue
- B. To maximize shareholder value
- C. To minimize expenses
- D. To minimize taxes

Question 2: Which of the following is a capital budgeting technique used to evaluate potential investments?

- A. Net Present Value (NPV)
- B. Price-earnings ratio
- C. Quick ratio
- D. Dividend discount model

Question 3: What is the role of a financial manager in a corporation?

- A. To make marketing decisions
- B. To design the corporate logo

Then we can iterate as we see fit:

CR

Give me a set of questions related to more complex concepts, like beta-values, WACC, black-scholes, and the like



Question 1: What is the beta coefficient in finance?

- A. A measure of the volatility of a stock's return relative to the overall market
- B. A measure of the company's total debt relative to its equity
- C. A measure of the systematic risk of an investment
- D. Both A and C

Question 2: Which of the following is a key assumption of the Black-Scholes option pricing model?

- A. Stock prices follow a random walk
- B. Dividends are paid continuously
- C. Volatility is constant over time
- D. All of the above

Question 3: The cost of equity for a company can be estimated using which of the following models?

- A. Capital Asset Pricing Model (CAPM)
- B. Dividend Discount Model (DDM)
- C. Weighted Average Cost of Capital (WACC)
- D. Both A and B

Question 4: What is the primary purpose of calculating a company's Weighted Average Cost of Capital (WACC)?

A. To determine the optimal capital structure for a company.

And then for a fun one, we can have ChatGPT develop a text where we have to fill in the blanks with concepts we have learned:



In a stunning turn of events, investors are flocking to a new investment strategy that many believe to be the future of finance. This groundbreaking approach, known as the _____, has gained significant traction in recent months as it promises to bring stability and predictability to the world of investing.

The _____ was first introduced in the 1960s by two financial theorists who aimed to create a method for determining the appropriate rate of return for an asset based on its risk relative to the overall market. The core principle of the _____ is the idea that investors should be rewarded for taking on additional risk. As a result, the _____ enables investors to estimate the expected return on an investment by considering the risk-free rate, the asset's sensitivity to market movements, and the market risk premium.

In the past year, the popularity of the _____ has skyrocketed. Financial analysts, portfolio managers, and individual investors alike are increasingly relying on the _____ to make informed decisions about the risks and potential returns associated with various investment opportunities. Some experts believe that the widespread adoption of the _____ could lead to a more stable and efficient market, as investors become better equipped to manage and diversify their portfolios.

While critics argue that the _____ relies on several assumptions that may not always hold true in the real world, proponents maintain that it remains a valuable tool for understanding the relationship between risk and return. As the finance industry continues to evolve, the _____ is likely to remain a crucial concept shaping the way investors approach their investments.

[Fill in the blanks with the appropriate concept]

And the answer is:



Give me just the list of concepts that are correct



Capital Asset Pricing Model (CAPM)

Our good old friend, CAPM, developed by Sharpe and Lintner, with the former receiving the Nobel Prize in Economics for the idea.

Bing for students

Compared to ChatGPT, Bing is probably a considerably more powerful tool when used correctly.⁴ The significant advantages of the integrated search engine and the stronger model can yield quite incredible results. Its usability, however, scales with the sophistication of user inputs. This means that if you manage to improve your interaction with Bing, you should also generally see improvements in Bing's outputs to you.

A note on prompts: Based on Ethan Mollick's practice, I have developed a standard approach to most Bing prompts. It follows this model:

Search for X. Search for Y. Then use those searches to answer Z.

This way, you ask the AI to search for things and integrate those search results into its answer to the thing you actually want to know about. This is not always necessary, but often it is a handy way to make more complicated requests, as I will demonstrate later.

Searching and explaining concepts

Let us ask Bing to help us understand Porter's Five Forces, a very basic framework in management theory:

Explain porter's five forces to me. Provide an example of how it can be used to analyze firms.

Porter's Five Forces is a model that identifies and analyzes five competitive forces that shape every industry and helps determine an industry's weaknesses and strengths ¹. The five forces are:

- **Competitive rivalry:** The intensity of competition among existing firms in the industry.
- **Supplier power:** The bargaining power of suppliers who can affect the industry's input costs and quality.
- **Buyer power:** The bargaining power of buyers who can affect the industry's output prices and demand.
- **Threat of substitution:** The extent to which alternative products or services can replace the industry's offerings.
- **Threat of new entry:** The ease or difficulty of new entrants to enter the industry and compete with existing firms.

The model can be used to analyze firms by assessing how each force affects their profitability and competitive position. For example, a firm with high supplier power can charge higher prices, reduce quality, or limit availability of inputs to its customers ². A firm with low buyer power can increase prices, reduce quality, or limit availability of outputs to its customers ³.

Do you have a specific industry or firm in mind that you want to analyze using Porter's Five Forces?

Learn more: 1. [investopedia.com](https://www.investopedia.com/terms/p/porters-five-forces-analysis.asp) 2. [isc.hbs.edu](https://hbs.hanze.nl/isc/PortersFiveForcesAnalysis.html) 3. [mindtools.com](https://www.mindtools.com/pages/article/newTMC_00001.htm)

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Not bad, Bing. But I want to learn by understanding a real-life example:

⁴ This changes from time to time. As of 19th of March, Bing creative is more powerful than ChatGPT given its internet access, but Bing Balanced is less capable (possibly running the 3.5 version) but still has internet access. Experiment accordingly.

Search for how to apply Porter's five forces to analyse a company. Then search for Apple inc. Then combine those searches to make a simple application of Porter's five forces to Apple inc.

A simple application of Porter's five forces to Apple Inc. could look something like this:

- Competitive rivalry: High. Apple faces intense competition from other technology companies such as Samsung, Huawei, Microsoft, Google, Dell, Lenovo etc. that offer similar or cheaper products with different features and capabilities ².
- Supplier power: Low. Apple has a large network of suppliers around the world that provide components and materials for its products. Apple has high standards for quality and environmental responsibility, which limits its supplier choices but also gives it leverage over them ².
- Buyer power: Moderate. Apple has a loyal customer base that values its brand image and user experience. However, customers also have many options to choose from in the technology market, and some may switch to cheaper or more innovative products if they are dissatisfied with Apple's offerings or prices ².
- Threat of substitution: High. Apple operates in a dynamic and fast-changing industry where new technologies and trends emerge constantly. Customers can easily switch to alternative products or services that meet their needs better or offer more value for money ².
- Threat of new entry: Low. Apple has a strong competitive advantage due to its innovation capabilities, brand recognition, customer loyalty, distribution network and economies of scale. It would be difficult for new entrants to enter the market and challenge Apple's position without significant resources and expertise ².

I hope this helps you understand how to apply Porter's five forces to analyse a company.

Learn more: [1. masterclass.com](#)

[2. en.wikipedia.org](#)

[3. britannica.com](#)

+4 more

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Bing also works with concepts that are coupled with mathematical operations. Suppose we want to recap the wonders of monopoly profit optimization in managerial economics:

Search for monopoly profit optimization in managerial economics. Explain how a monopoly firm maximizes profit in such a situation.

According to Investopedia ¹, a monopoly firm is a profit maximizer that controls the price and quantity demanded in a market with no competition. To maximize profit, a monopoly firm produces at the quantity where marginal revenue (MR) is equal to marginal cost (MC) ² ³. This means that the firm does not produce any more units that would lower its profit.

Do you want me to explain how to calculate MR and MC for a monopoly firm?

Learn more: [1. investopedia.com](#)

[2. khanacademy.org](#)

[3. courses.lumenlearning.com](#)

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Okay, but as a student, this is not terribly helpful. Bing can adjust the explanation to your level:

I am an undergrad business student and I have a hard time understanding these concepts. Can you help me understand what MC is? Please give me an example of how the concept is used. Also, my math skills are not very good.

Sure, I can help you understand what MC is. Marginal cost (MC) is the change in total cost that occurs when producing one more unit of a good or service [1](#) [2](#). It measures how much it costs to produce an extra unit of output.

For example, suppose a company produces 1000 units of a product at a total cost of \$230,000. If it produces 1001 units, the total cost increases to \$230,050. The marginal cost of producing the 1001st unit is \$50 (\$230,050 - \$230,000).

Do you want me to explain how to calculate MC using a formula?

Learn more: [1. investopedia.com](#) [2. corporatefinanceinstitute.com](#) [3. indeed.com](#)

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But I want it to do it in a way that aligns with the textbook we are using in our course:

Search for the managerial textbook by Scheibye and Bentzen. Then search for MC = MR optimization in a monopoly situation. Use those searches to explain in a simple way how a monopoly firm optimizes profit. Make sure the math is simple and easy to follow. Please explain in detail each step of the process

Even though I misspelt Bentzen (sorry, Eric) Bing still finds it. Bing can't read this particular book, but adapts the explanation nonetheless:

I found a managerial textbook by Scheibye and Bentzen [1](#), but it does not seem to have a specific section on MC = MR optimization in a monopoly situation. However, I found some other sources that explain this concept [2](#) [3](#) [4](#) [5](#).

In a simple way, a monopoly firm optimizes profit by producing where its marginal revenue (MR) is equal to its marginal cost (MC). This means that the firm earns as much revenue as possible for each additional unit it produces, without increasing its cost more than its revenue.

To find this optimal point, we need to know two things: the demand curve and the cost curve of the monopoly firm. The demand curve shows how much consumers are willing to pay for different quantities of the good. The cost curve shows how much it costs the firm to produce different quantities of the good.

The MR curve is derived from the demand curve by finding how much revenue changes when quantity changes by one unit. The MC curve is derived from the cost curve by finding how much cost changes when quantity changes by one unit.

The MR and MC curves intersect at a point where $MR = MC$. This is where profit is maximized because any additional unit would either lower revenue or increase cost more than revenue.

Do you want me to show you how to graph these curves and find this point?

Learn more: [1. books.google.com](#) [2. pressbooks.oer.hawaii.edu](#) [+6 more](#)

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And now let us use Bing to give us a numerical example of this operation:

Okay, I will provide a numerical example of this process using one of the sources I found [1](#).

Suppose a monopoly firm has a cost function $C(Q) = 100 + Q^2$, where Q is the quantity of output. This means that its fixed cost is 100 and its variable cost is Q^2 . Its marginal cost is $MC(Q) = 2Q$, which is obtained by taking the derivative of $C(Q)$ with respect to Q .

The firm faces a demand function $P(Q) = 150 - 2Q$, where P is the price of output. This means that consumers are willing to pay 150 for one unit of output, but their willingness to pay decreases by 2 for each additional unit. The firm's total revenue is $TR(Q) = P(Q)*Q = (150 - 2Q)*Q$. Its marginal revenue is $MR(Q) = 150 - 4Q$, which is obtained by taking the derivative of $TR(Q)$ with respect to Q .

To find the profit-maximizing output level, we set $MR(Q)$ equal to $MC(Q)$:

$$MR(Q) = MC(Q)$$

$$150 - 4Q = 2Q$$

Solving for Q , we get:

$$Q^* = 25$$

This means that the firm should produce 25 units of output to maximize its profit.

To find the profit-maximizing price level, we plug Q^* into $P(Q)$:

$$P^* = P(25)$$

$$P^* = 150 - 2(25)$$

$$P^* = 100$$

This means that the firm should charge \$100 per unit of output to maximize its profit.

To find the profit level, we subtract total cost from total revenue:

$$\text{Profit} = TR - TC$$

$$\text{Profit} = TR(25) - TC(25)$$

$$\text{Profit} = (150 - 4(25))(25) - (100 + (25)^2)$$

$$\text{Profit} = (50)(25) - (725)$$

$$\text{Profit} = \$550$$

This means that the firm earns \$550 in profit by producing and selling 25 units at \$100 each.

Does this example help you understand how a monopoly firm optimizes profit?

Learn more: [1. coursera.org](#) [2. e-education.psu.edu](#) [3. economics.utoronto.ca](#) [+1 more](#)

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I can verify that this is 100 % correct according to Scheibye and Bentzen's textbook. Congratulations on learning how to optimise profits in a monopoly situation!

Providing examples of concepts and theoretical ideas

The above concept searches involve examples almost by design, but in management studies and social science, it is often really useful to get more extensive examples to better understand more complex theoretical ideas. Bing is great for this.

For example, in negotiation theory, there can be instances where negotiations break down even when both parties actually have a viable middle ground - the so-called Zone of

Possible Agreements (ZOPA). This is often a relatively complex situation, so it is very useful to have some concrete examples to better understand what is going on.

I am trying to understand negotiation theory, including BATNAs and ZOPA. I wonder about situations where negotiations break down even when there are possible ZOPA options. Can you provide an example of a real-life situation where such a negotiation breakdown happened?

Sure, I can help you with that. Negotiation theory is a branch of social science that studies how people interact and reach agreements. BATNA stands for **Best Alternative To a Negotiated Agreement** and it refers to the course of action a party will take if no agreement can be reached during a negotiation ¹. ZOPA stands for **Zone Of Possible Agreement** and it refers to the range in a negotiation where two or more parties can find common ground ².

Sometimes, negotiations break down even when there are possible ZOPA options because of various reasons, such as lack of trust, communication barriers, cognitive biases, emotional reactions, cultural differences or competitive tactics. One example of a real-life situation where such a negotiation breakdown happened was the 2011 debt ceiling crisis in the United States. The debt ceiling is the legal limit on how much money the federal government can borrow to pay its bills. In 2011, Congress and President Obama had to agree on raising the debt ceiling before August 2nd to avoid defaulting on their obligations.

However, the negotiations were very difficult and contentious because of ideological differences between Democrats and Republicans over taxes and spending cuts. Both sides had their own BATNAs: Democrats could let the government default and blame Republicans for causing an economic crisis; Republicans could refuse to raise taxes and appeal to their conservative base. The ZOPA was somewhere between raising some taxes and cutting some spending, but neither side was willing to compromise or communicate effectively.

As a result, the negotiations broke down several times and came very close to missing the deadline. Eventually, they reached a last-minute deal that raised the debt ceiling but also created a supercommittee to find more deficit reduction measures by November 2011. However, this deal was widely seen as unsatisfactory by both parties and by many Americans who felt that their leaders had failed them.

I hope this helps you understand negotiation theory better. Do you have any other questions? 😊

Learn more: [1. fourweekmba.com](https://www.fourweekmba.com) [2. investopedia.com](https://www.investopedia.com)

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This is a great example of exactly the situation I was wondering about. Evidently, the example used here was complex, but Bing happily explains how the concepts can be used to understand the situation.

One of the most challenging parts of university education, in my experience, is to make abstract concepts understandable for all students. Here, Bing can be quite useful. Suppose you are a student taking my classes on philosophy of science (I promise, you'll love it!) but the concepts are too abstract to understand:

I am trying to learn what ontology and epistemology means. My teacher is trying to give a lot of examples, but they all seem very abstract or complex. Can you explain the two concepts in simple terms, and give very simple concrete examples of how they are used or can be understood?

Sure, I can try to explain ontology and epistemology in simple terms. Ontology is the study of being or existence ¹. It asks questions like: What is this universe we are in? Does God exist? What kinds of things are real? Epistemology is the study of knowledge ². It asks questions like: How do we know what we know? What are the sources and limits of human knowledge? How do we justify our beliefs?

A simple example of ontology is when you wonder if there is a life after death. You are asking about what kind of reality exists beyond your physical life. A simple example of epistemology is when you wonder if you can trust your senses. You are asking about how reliable your perception is as a way of knowing.

Does this help you understand ontology and epistemology better?

Learn more: [1. access2knowledge.org](#) [2. britannica.com](#) [3. bing.com](#) [+2 more](#)

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All right, this is very straightforward, but note that because I haven't told Bing who we are, it is giving us a fairly generic explanation. This is something we can ask Bing to improve:

THank you, but I am a business and management undergrad student, and I don't understand how ontology and epistemology is supposed to be relevant for my studies. Can you explain how these concepts can be relevant or useful in management studies?

You're welcome. Ontology and epistemology are relevant for management studies because they help you understand how different perspectives and assumptions affect your approach to managing people, organizations, and problems ¹. For example, if you have a realist ontology, you believe that there is an objective reality that exists independently of your perception. If you have a subjectivist ontology, you believe that reality is constructed by your interpretation and experience ². These ontological views can influence how you collect and analyze data, how you communicate with others, and how you design solutions.

Similarly, epistemology helps you evaluate how reliable and valid your knowledge is. For example, if you have a deductive epistemology, you use logic and reasoning to test hypotheses based on existing theories. If you have an inductive epistemology, you use observation and experience to generate new theories based on patterns ³. These epistemological views can affect how you conduct research, how you justify your decisions, and how you learn from feedback.

Do these examples make sense to you?

Learn more: [1. ceopedia.org](#) [2. semanticscholar.org](#) [3. repository.unair.ac.id](#) [+2 more](#)

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There are a lot of ways to understand these concepts. Let us pretend to be a student that is surprised that the categorizations used are different than the ones used in the curriculum:

Thanks, but those concepts are different than the ones we are using. We are reading Welch et all 2011 on case study paradigms, and Buch-Hansen 2022 on philosophy of science typologies. Can you redo the explanation taking those texts into account?

Okay, I can try to redo the explanation using those texts. According to Welch et al. (2011), case study paradigms are different ways of theorizing from case studies, which are based on different ontological and epistemological assumptions ¹. They propose four types of case study paradigms: naturalist, interpretive, critical realist, and pragmatic ¹. Each paradigm has a different view on what reality is, how we can know it, and how we can explain it.

According to Buch-Hansen (2022), philosophy of science typologies are flexible tools that can help social scientists reflect on their research assumptions and choices ². He suggests six dimensions that can be used to compare different philosophy of social science perspectives: ontology, epistemology, methodology, normativity, reflexivity, and interdisciplinarity ². Each dimension has a range of possible positions that reflect different views on social reality and knowledge.

Do you want me to give you some examples of how these typologies can be applied to management studies?

Learn more: [1. sciencedirect.com](https://www.sciencedirect.com) [2. onlinelibrary.wiley.com](https://onlinelibrary.wiley.com) [3. researchgate.net](https://www.researchgate.net) [+3 more](#)

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Now, Bing is hallucinating! The details about these two texts are wrong. The reason for this is that Bing can't access the actual texts, so it simply makes up reasonable hypothetical content. Also, note that Bing did not actually redo the explanation. Let's try a different way of asking this question:

I am trying to learn about ontology and epistemology. We are reading the text by Buch-Hansen 2022 on philosophy of science typologies. I am a business student at the undergrad level, and I have a hard time understanding how these concepts are to be used in practice. How do I use constructionism, positivism, and critical realism in a practical way?

Hello, this is Bing. I'm glad you are interested in learning about ontology and epistemology. Ontology is the study of what exists and how things are related to each other ¹. Epistemology is the study of how we can know what exists and what is true ¹. These concepts are important for philosophy of science because they help us understand how different research perspectives approach reality and knowledge.

According to Buch-Hansen 2022 ² ³, there are three main philosophy of social science perspectives: constructionism, positivism, and critical realism. Constructionism assumes that reality is socially constructed by human actors and that knowledge is relative and subjective. Positivism assumes that reality is objective and independent of human observation and that knowledge is based on empirical observation and testing. Critical realism assumes that reality consists of multiple layers of causation and that knowledge is fallible but can be improved by combining empirical evidence and theoretical reasoning.

To use these perspectives in a practical way, you need to consider how they influence your research questions, methods, data analysis, and conclusions. For example, if you are a constructionist, you might focus on how people create meaning through language and culture. If you are a positivist, you might focus on measuring observable phenomena using quantitative methods. If you are a critical realist, you might focus on explaining the underlying mechanisms that produce observable outcomes using qualitative methods.

I hope this helps you understand ontology and epistemology better. Do you have any specific questions about these concepts or perspectives? 😊

Learn more: [1. access2knowledge.org](https://access2knowledge.org) [2. onlinelibrary.wiley.com](https://onlinelibrary.wiley.com) [3. rucforsk.ruc.dk](https://rucforsk.ruc.dk) [+3 more](#)

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Using searches to structure ideas

Since Bing can search and combine searches, you can use Bing to test out ideas. Here, it can be an advantage to run Bing in creative mode, as it gives longer and more creative responses at the expense of precision and accuracy.

Suppose that we are curious about making a bachelor thesis about sustainable business modelling in the Danish energy sector. Bing can help us structure our ideas:

I want to write a bachelor thesis on sustainable business models in Danish energy companies. Search for conceptualizations of what a business model is. Then search for sustainable business modelling. Search for a list of Danish energy companies. Combine those searches into a list of ideas of possible ways to approach the topic

Note here the standard pattern of *Search X, Search Y, then combine into Z*.

Hello, this is Bing. I'm happy to help you with your thesis topic. 😊

A business model is a high-level plan of how your company sells and operates ¹. It includes aspects such as value proposition, target audience, offers, strategies, organizational structure and processes ¹ ². A business model is a specification describing how an organization fulfills its purpose ². It also explains how you deliver value to your customers at an appropriate cost ³ and how you plan to make a profit ⁴.

There are different types of business models, such as subscription model, freemium model, advertising model, franchise model and platform model ⁴ ⁵. Some business models are more suitable for certain industries or markets than others.

One way to design a business model is to use the **business model canvas**, which is a tool that helps you visualize and test your assumptions about your value proposition, customers, channels, revenue streams, cost structure and key resources ⁶.

Learn more: [1. businessmodelanalyst.com](https://www.businessmodelanalyst.com) [2. techtarget.com](https://www.techtarget.com) [3. articles.bplans.com](https://articles.bplans.com)

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As you can see, it is slightly mixing things up. The middle paragraph is actually about another way of thinking about business modelling than the top and bottom. Let's go with the business model canvas, a fairly standard way to conceptualise business model:

Let's work on the business model canvas. Is there a way to integrate that idea with sustainability?

Yes, there is a way to integrate sustainability with the business model canvas. A sustainable business model is an approach that creates economic value by maintaining or regenerating natural habitats, delivering social benefits and capturing environmental benefits ¹. A sustainable business model is commercially profitable, socially responsible and environmentally friendly ².

One way to design a sustainable business model is to use the **sustainable business model canvas**, which is a modified version of the original tool that adds two additional elements: social costs and social benefits ³. Social costs are the negative impacts of your business activities on society, such as pollution, inequality or exploitation. Social benefits are the positive impacts of your business activities on society, such as education, health or empowerment.

By adding these elements to your canvas, you can identify how your value proposition can address both customer needs and societal challenges, how your revenue streams can reflect both economic and social value creation, how your cost structure can account for both financial and environmental costs, and how your key resources can include both tangible and intangible assets ³.

Learn more: [1. ictsd.org](#) [2. business.com](#) [3. link.springer.com](#) [4. bing.com](#) [+2 more](#)

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Interesting stuff. Let's not go back and apply this idea to Danish energy companies:

Very interesting. Search for a list of Danish energy companies. Provide some ideas about how the sustainable business model canvas can be used to analyze those firms.

Here are some of the Danish energy companies that I found:

- Vestas: A manufacturer of wind turbines and one of the largest wind turbine companies in the world ¹.
- Orsted: A renewable energy company that develops offshore wind farms, bioenergy plants and waste-to-energy solutions ¹.
- Steeper Energy: A developer of hydrothermal liquefaction technology that converts biomass into renewable fuels ¹.
- Danish Renewables: A consultancy firm that provides services for renewable energy projects, such as feasibility studies, project management and engineering ¹.
- Danish Energy Agency: A government agency that oversees energy policy, regulation and research in Denmark ¹.
- Green Hydrogen Systems: A producer of electrolyzers that use renewable electricity to split water into hydrogen and oxygen ¹.
- Cambi Group A/S: A provider of thermal hydrolysis solutions that enhance biogas production from organic waste ¹.
- COWI: An engineering consultancy firm that offers services for energy infrastructure, such as power plants, transmission lines and smart grids ¹.

Creative mode shows its face here by including the Danish Energy Agency as a company (it absolutely is not) but let's ignore that for a moment.

You can use the sustainable business model canvas to analyze these firms by filling out each element with information from their websites, reports or other sources. For example:

Element	Vestas
Value proposition	Providing clean and affordable wind power solutions for customers worldwide
Customer segments	Utilities, independent power producers, developers and investors
Channels	Direct sales, service contracts, online platforms and partnerships
Revenue streams	Turbine sales, service agreements, spare parts and digital solutions
Cost structure	Manufacturing costs, R&D costs, operational costs and financing costs
Key resources	Wind turbines, service fleet, employees, patents and brand
Key activities	Designing, manufacturing, installing and servicing wind turbines
Key partnerships	Suppliers, subcontractors, research institutions and industry associations
Social costs	Potential impacts on wildlife habitats (e.g., birds), noise pollution or visual intrusion
Social benefits	Reducing greenhouse gas emissions (e.g., CO2), creating local jobs or supporting community development

You can repeat this process for other firms to compare their business models and identify their strengths and weaknesses in terms of sustainability.

Learn more: [1. greenesa.com](https://greenesa.com) [2. statista.com](https://www.statista.com) [3. en.wikipedia.org](https://en.wikipedia.org) [4. bolddata.nl](https://bolddata.nl)

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It made a table on its own, and this is actually a very straightforward way to apply the sustainable business model canvas to any given company. The entire process for me took 6 minutes, most of the time spent waiting for Bing to answer. Evidently quite handy for structuring ideas.

Finding relevant literature

This is a capability where you have to be extra careful even with Bing. As noted in other examples, Bing lies to you from time to time. It depends on the prompt, but it is also somewhat random. Follow the fundamental rule to never lift anything off of Bing without checking yourself if facts and accuracy matter.

Let's find some relevant literature on sustainable business strategy for our master project on sustainable shipping:

I am writing a master thesis about sustainable shipping, and I wonder what the most recent research literature on sustainable business is like. Can you search for some of the most important research articles on sustainable business and list the three most relevant ones?

Hello, this is Bing. I'm happy to help you with your thesis. 😊

I searched for sustainable business research articles and found some interesting results. Here are the three most relevant ones based on their titles and snippets:

- **Sustainable Business Went Mainstream in 2021** ¹: This article describes the five biggest climate and sustainable business stories from the past year, such as net-zero commitments, green finance, circular economy, social justice, and stakeholder capitalism.
- **Sustainable business practices** ²: This is a collection of articles from Harvard Business Review that cover various topics related to sustainability, such as water risk, carbon pricing, green innovation, ESG reporting, and corporate activism.
- **Why all businesses should embrace sustainability** ³: This article explains what sustainability means for businesses and why it is important for creating long-term value. It also provides some examples of companies that have successfully integrated sustainability into their strategies.

I hope these articles are helpful for your thesis. Do you want me to search for anything else related to sustainable shipping?

Learn more: [1. hbr.org](#) [2. hbr.org](#) [3. imd.org](#)

1 of 10 ●

These articles all exist, but they are what we call “grey literature” - possibly relevant, but not peer reviewed or published in a recognized research journal. Let's ask Bing about that:

Thanks. What about research articles in peer-reviewed management journals? Only search journals that are ranked in SCOPUS, I don't want grey journals or predatory journals.

You're welcome. I searched for sustainable business research articles in peer-reviewed management journals that are ranked in SCOPUS and found some relevant results. Here are the three most relevant ones based on their titles and snippets:

- **Journal of Business Research** ¹: This journal publishes scholarly empirical and theoretical research articles that have a broad range of stakeholders, including scholars, researchers, executives, and policy makers. It covers various topics related to business research, such as marketing, finance, organizational behavior, ethics, and sustainability.
- **Sustainability** ²: This journal is an international, cross-disciplinary, scholarly, peer-reviewed and open access journal of environmental, cultural, economic, and social sustainability of human beings. It provides an advanced forum for studies related to sustainability and sustainable development.
- **Journal of Management** ³: This journal is committed to publishing scholarly empirical and theoretical research articles that have a high impact on the management field as a whole. It covers domains such as strategy, leadership, entrepreneurship, innovation, organizational behavior, human resource management, and social responsibility.

I hope these journals are helpful for your thesis. Do you want me to search for anything else related to sustainable shipping?

Learn more: [1. sciencedirect.com](#) [2. mdpi.com](#) [3. journals.sagepub.com](#)

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This is technically what we asked for, but not what we wanted. This is a great example of why prompt design is quite important. Bing understood us to “search [for] journals that are ranked in SCOPUS”, not research articles per se.

Search in those three journals and highlight some academic articles about sustainable business

I searched for sustainable business articles in Journal of Business Research and found some relevant results. Here are the three most relevant ones based on their titles and snippets:

- **Business sustainability: It is about time** ¹: This article argues that time should be at the center of organizational theorizing, in order to enhance both organizational and societal outcomes over the long term. It proposes a framework for understanding how sustainable businesses manage intertemporal trade-offs in strategic decision making, so that both the short and long term are considered.
- **Sustainable Business Strategy** ²: This article provides an overview of sustainable business strategy, which is the integration of economic, environmental, and social aims into a firm's goals, activities, and planning, with the aim of creating long-term value for the firm, its stakeholders, and society. It discusses some of the key concepts, challenges, and opportunities for sustainable business strategy.
- **The impact of corporate sustainability on organizational processes and performance**: This article examines how corporate sustainability affects organizational processes and performance. It uses a large longitudinal data set to show that firms with strong corporate sustainability practices have better operational efficiency, employee productivity, customer loyalty, stakeholder engagement, risk management, innovation capability, and financial performance.

I hope these articles are helpful for your thesis. Do you want me to search for anything else related to sustainable shipping?

Learn more: 1. journals.sagepub.com 2. [researchgate.net](https://www.researchgate.net) 3. [sciencedirect.com](https://www.sciencedirect.com)

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Two of those articles are not in the journals listed, and there is not a direct link to the third. Clearly, Bing cannot substitute regular academic search engines here. But it can do something else:

I am writing a master thesis on sustainable business. I wonder whether other fields than management studies have done academic research on sustainable business strategy, but used different concepts or terms to talk about it. Can you provide some guidance on this?

Sure, I can help you with that. Sustainable business strategy is a term that refers to the integration of economic, environmental, and social factors into an organization's goals, activities, and planning¹. It aims to create long-term value for the organization and its stakeholders while being mindful of conserving and protecting resources².

Some other fields that have done academic research on sustainable business strategy or related concepts are:

- Engineering: This field focuses on designing products and processes that minimize environmental impacts and optimize resource efficiency. Some examples of engineering concepts related to sustainable business strategy are life cycle assessment, eco-design, circular economy, and green innovation.
- Economics: This field studies how people make decisions under scarcity and uncertainty. Some examples of economic concepts related to sustainable business strategy are externalities, social cost-benefit analysis, green growth, and environmental valuation.
- Sociology: This field examines how human societies interact with each other and their environment. Some examples of sociological concepts related to sustainable business strategy are corporate social responsibility, stakeholder theory, social capital, and social entrepreneurship.

I hope this helps you with your thesis. Do you have any more questions?

Learn more: [1. researchgate.net](#) [2. businessleadershiptoday.com](#) [3. online.hbs.edu](#) [+6 more](#)

1 of 10

Way more useful. This is something Bing can do that search engines are bad at: sometimes, the same phenomenon or concept is used across fields but called different things. Bing is alerting us to this here, suggesting that circular economy, social cost-benefit analysis, and corporate social responsibility are concepts used in other fields that could relate to sustainable business. We can take those concepts (and the other ones suggested) and immediately plug in to Google Scholar, Scopus, or Web of Science.

But we can also ask Bing to help us understand the overlap:

That's a good question. Sustainable business strategy and corporate social responsibility (CSR) are related but not identical concepts. According to one source¹, CSR is a business practice that considers the impact a company has on society, employees, and other stakeholders. It involves minimizing harm, practicing fair business, being responsible along a global supply chain, exercising philanthropy and creating a self-oriented human capital strategy.

Sustainable business strategy, on the other hand, is a broader concept that incorporates economic, environmental, and social factors into an organization's goals, activities, and planning². It aims to create long-term value for the organization and its stakeholders while being mindful of conserving and protecting resources. Sustainable business strategy can be seen as a strategic approach to CSR that aligns with the core purpose and vision of the organization³.

In other words, CSR is more about what a company does to be socially responsible, while sustainable business strategy is more about why and how a company does it. Does that make sense?

Learn more: [1. greenbusinessbureau.com](#) [2. link.springer.com](#) [3. hbr.org](#)

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CSR as a concept is rapidly becoming obsolete, but the overall point made by Bing here is useful nonetheless.

Identifying “standard practice” in structuring academic arguments and papers

A question I get regularly is, “how do you structure a [bachelor/master thesis, internship report, exam essay, presentation, synopsis] in [X, Y, Z course / program].” Great question, student. I’ll be happy to help you, but why not ask Bing?

I want to write an internship at Copenhagen Business School, but I am unsure on how to structure it. I have a max of 40 pages, and I know my supervisor wants me to include considerations on theory, methodology, the background of the company. Also, focus should be on analysis and theoretical application. Please search for standard approaches to structuring internship reports at CBS, and then use that search to suggest a preliminary structure for my assignment

I'm glad you asked. Writing an internship report can be a challenging task, but it can also help you showcase your skills and achievements. 😊

Based on my web searches [1](#) [2](#) [3](#), a possible structure for your internship report at CBS could be:

- Title page: Include your name, class, date and the name of the organization where you did your internship.
- Table of contents: List all the sections and sub-sections of your report with page numbers.
- Introduction: Provide some background information on the organization and its goals, as well as your motivation for choosing it. Also, state your research question and how it relates to your internship experience.
- Literature review: Review relevant theories and concepts that inform your research question. Explain how they apply to your internship context and what gaps or limitations they have.
- Methodology: Describe the methods you used to collect and analyze data during your internship. Explain why you chose these methods and how they address your research question. Also, discuss any ethical or practical issues you encountered or resolved.
- Analysis: Present and discuss your findings from the data analysis. Use tables, graphs or charts to illustrate your points. Relate your findings to the literature review and show how they answer your research question.
- Conclusion: Summarize the main points of your report and highlight the key contributions of your internship project. Also, provide some recommendations for future research or practice based on your findings.
- References: List all the sources you cited in your report using a consistent citation style (e.g., APA, Harvard).
- Appendices: Include any additional material that supports your report but is too long or detailed to fit in the main text (e.g., interview transcripts, survey questions).

I hope this helps you get started on writing an effective internship report at CBS. Good luck! 👍

Learn more: [1. indeed.com](#) [2. kursuskatalog.cbs.dk](#) [3. kursuskatalog.cbs.dk](#)

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Great job, Bing. I would probably structure it slightly differently, but as a starting point this is very good. Ask Bing the same thing and take that draft structure to your supervisor for deliberation.

As a subtle note, I want to highlight that Bing searched in the CBS course catalogue for internship report requirements and then used that search to structure its answer. In other words, as far as I can tell Bing knew that the best way to structure the internship report would be to take departure in what CBS requires internship reports to do. Not bad at all, Bing.

Another way to use Bing is to structure your argument. Suppose your problem is that you don't know how to structure your analysis in a clear way:

I want you to help me structure my analysis. I am using Schein's theory of culture and his three levels (artefacts, espoused norms/values, deep taken for granted beliefs) to analyze a company culture. based on your search from earlier and best practice in academic essays, what is the best way that I can structure the argument in the analysis?

I'm happy to help you with your analysis. Schein's theory of culture is a useful framework for understanding how organizational culture influences behavior and performance [1](#) [2](#).

Based on my web searches [1](#) [2](#) [3](#) [4](#) [5](#), a possible way to structure your analysis using Schein's theory of culture is:

- Introduction: Introduce your research question and explain why it is important to analyze the company culture using Schein's theory. Provide some background information on the company and its context. Also, state your main argument or thesis statement that summarizes your findings.
- Body: Divide your body into three main sections, each focusing on one of Schein's three levels of culture: artifacts, espoused values and basic assumptions. For each section, do the following:
 - Define and explain what the level of culture means according to Schein and how it relates to your research question.
 - Provide examples of evidence from your data collection (e.g., interviews, observations, documents) that illustrate the level of culture in the company. Use quotes, paraphrases or summaries to support your claims.
 - Analyze how the level of culture affects or reflects the behavior and performance of the employees and managers in the company. Use relevant theories and concepts from your literature review to interpret your evidence and show how it answers your research question.
 - Discuss any strengths, weaknesses, opportunities or threats that arise from the level of culture in the company. Provide some recommendations or suggestions for improvement if applicable.
- Conclusion: Restate your main argument or thesis statement and summarize how you have supported it with evidence and analysis throughout your report. Highlight the key contributions and implications of your analysis for theory and practice. Also, acknowledge any limitations or challenges you faced during your research and suggest some directions for future research.

I hope this helps you structure your analysis using Schein's theory of culture. Good luck! 

Learn more: [1. wiki.doing-projects.org](#) [2. wiki.doing-projects.org](#) [+3 more](#)

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While we should adapt the introduction and conclusion to the overall structure, the body is pretty close to what I would suggest as a supervisor if my student came to me with this question. Once again, you can take this structure and immediately contact your supervisor with this as the basis for the structure for your analysis.

Operationalization

Most likely, you either vaguely remember having heard the word “operationalization” in your undergrad methods course (quantitative or qualitative), or you know what it means and dread the work you need to do.

Bing, please tell me what “operationalization” is in the context of social science and management studies. Provide examples of how it is used both in a quantitative and a qualitative methodological context.

Operationalization is **the process of defining how to measure a concept** that is not directly observable¹. It is often used in social science and management studies as part of the scientific method².

In a quantitative methodological context, operationalization involves choosing a **variable** to represent each concept and selecting **indicators** for each variable¹. For example, if you want to study creativity, you might use a variable like “number of uses for an object” and an indicator like “a paperclip”³.

In a qualitative methodological context, operationalization involves choosing a **theme** to represent each concept and selecting **codes** for each theme¹. For example, if you want to study organizational culture, you might use a theme like “values” and codes like “innovation”, “diversity”, “collaboration”, etc.¹

What are you interested in studying? 😊

Learn more: 1. [scribbr.com](https://www.scribbr.com) 2. en.wikipedia.org 3. [scribbr.com](https://www.scribbr.com)

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Weird example with the paperclip, but okay. Making good operationalizations for your concepts can be the most difficult part of a larger project, especially for a master thesis. Let's try to use Bing to operationalize some concepts. We talked about Schein already, so let's use that as a basis. First for a quantitative version of our master thesis.

I am writing a master thesis analyzing a specific organization and its culture using Schein's three-level framework of culture. We want to do a quantitative study, probably a simple regression model, and I wonder about ways to operationalize Schein's concepts in our variable design. Can you provide some ways this could be done?

Schein's three-level framework of culture consists of **artifacts**, **espoused values** and **underlying beliefs** [1](#) [2](#). Each level describes the degree to which cultural phenomena are visible to the observer [1](#).

To operationalize Schein's concepts in a quantitative study, you could use different types of variables and indicators for each level. For example:

- For artifacts, you could use **observable variables** such as organizational structure, dress code, rituals, symbols, etc. and measure them using indicators such as frequency, duration, intensity, etc. [3](#)
- For espoused values, you could use **attitudinal variables** such as mission statement, goals, norms, ethics, etc. and measure them using indicators such as surveys, interviews, ratings scales, etc. [3](#)
- For underlying beliefs, you could use **latent variables** such as assumptions about human nature, reality, truth, time etc. and measure them using indicators such as factor analysis [4](#), content analysis [5](#), thematic analysis, etc.

What is your research question?

Learn more: [1. bing.com](#) [2. fourweekmba.com](#) [3. worldofwork.io](#) [+3 more](#)

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We can go even further. Let's try to measure attitudes in a survey.

Let's suppose I want to do a survey measuring attitudinal variables. Specifically, I want to measure people's espoused beliefs about management authority, and to what extent people believe authoritarian managers are a good or a bad thing in the company. How could I operationalize this in a survey?

To operationalize your concept of espoused beliefs about management authority in a survey, you could use **Likert scale questions** that ask respondents to indicate their level of agreement or disagreement with statements related to authoritarian managers [1](#) [2](#) [3](#). For example:

- I prefer a manager who gives clear and direct instructions rather than one who lets me decide how to do my work.
- I think a manager should have the final say in all decisions affecting the team.
- I feel more motivated when my manager praises me for my achievements rather than when they criticize me for my mistakes.

You could also use **open-ended questions** that ask respondents to describe their views on authoritarian managers in their own words [2](#). For example:

- What are some advantages and disadvantages of having an authoritarian manager?
- How would you describe your ideal manager?
- How does your current manager's style affect your performance and satisfaction?

What is your target population?

Learn more: [1. tiny pulse.com](#) [2. talentlyft.com](#) [3. quantumworkplace.com](#)

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Bing correctly identifies the Likert scale as a good way to do it, and then comes up with relevant questions. Useful enough to use a basis for further discussion, or for more interaction with Bing.

For qualitative methodological approaches, we can use Bing in much the same way.

I am considering doing a qualitative in-depth case study using Schein's theory on a case organization. What are some ways I could operationalize Schein's three levels of culture in a qualitative study?

To operationalize Schein's three levels of culture in a qualitative case study, you could use different types of data collection and analysis methods for each level. For example:

- For artifacts, you could use **observation** to record and describe the visible elements of the organization such as logos, architecture, structure, processes, etc.¹ You could also use **document analysis** to examine written or visual materials produced by or related to the organization such as reports, newsletters, websites, etc.²
- For espoused values, you could use **interviews** to ask participants about their beliefs, opinions, goals, norms, ethics etc. related to the organization^{2 1}. You could also use **focus groups** to facilitate group discussions among participants who share similar roles or experiences in the organization².
- For underlying beliefs, you could use **thematic analysis** to identify and interpret recurring patterns or themes in your data that reflect the assumptions about human nature, reality, truth etc. that underlie the organizational culture³. You could also use **critical discourse analysis** to examine how language is used to construct and maintain power relations within the organization².

What is your case organization? 

Learn more: 1. [toolhero.com](https://www.toolhero.com) 2. journals.sagepub.com 3. expertprogrammanagement.com

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All right, but let's be a little more specific. Let us ask Bing the same questions students often ask me at this stage:

Okay, I want to do interviews, but what kind of questions could we ask people in a semi-structured interview to try to identify the interviewees' espoused norms and beliefs? Provide a few examples. For context, the organization is a medium-sized management consultancy in Denmark.

To identify the interviewees' espoused norms and beliefs in a semi-structured interview, you could ask open-ended questions that invite them to share their views on various aspects of the organization's culture. For example:

- What are some of the values that guide your work as a management consultant?
- How do you communicate and collaborate with your colleagues and clients?
- How do you deal with challenges or conflicts that arise in your projects?
- What are some of the expectations or standards that you have for yourself and others in your role?
- How do you balance your work and personal life?

What is your research objective? 

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Not bad. This could easily be the basis of a conversation between student, supervisor, and Bing on how to draft a full interview guide. In fact, why not ask Bing to draft a whole interview guide? I ask Bing to reference the standard textbooks on interview practice.

Please make a draft interview guide appropriate for a 45 minute interview. I want the questions to focus on artifacts and espoused norms and beliefs, and to a lesser extent underlying beliefs because they are difficult to identify. Make sure there are no more than 8 standard questions. Provide ideas for probing strategies for each question. Search Clark and Bryman's 2021 textbook and Kvale and Brinkmann's textbook for guidance on how to do this

Here is a draft interview guide for a 45 minute interview with a management consultant from a medium-sized organization in Denmark. The questions are based on Schein's three levels of culture and aim to elicit artifacts, espoused norms and beliefs, and underlying beliefs. The probing strategies are based on Clark and Bryman's 2021 textbook ¹ and Kvale and Brinkmann's textbook ².

- Introduction: Thank the participant for their time and consent. Explain the purpose of the study, confidentiality, recording, duration, etc. Ask if they have any questions before starting.
- Question 1: Tell me about your background and how you became a management consultant in this organization. (Probing strategies: ask for clarification or elaboration; use silence or encouragement; summarize or paraphrase)
- Question 2: How would you describe your organization's culture to someone who is not familiar with it? (Probing strategies: ask for examples or illustrations; use contrast or comparison; challenge or confront)
- Question 3: What are some of the visible signs or symbols that represent your organization's culture? (Probing strategies: ask for specific instances or occasions; use follow-up questions; probe for feelings or emotions)
- Question 4: What are some of the values or principles that guide your work as a management consultant? (Probing strategies: ask for justification or explanation; use hypothetical scenarios; probe for alternative perspectives)
- Question 5: How do you communicate and collaborate with your colleagues and clients? (Probing strategies: ask for details or descriptions; use direct quotations; probe for contradictions or inconsistencies)
- Question 6: How do you deal with challenges or conflicts that arise in your projects? (Probing strategies: ask for outcomes or consequences; use scaling questions; probe for assumptions or beliefs)
- Question 7: What are some of the expectations or standards that you have for yourself and others in your role? (Probing strategies: ask for evaluation or assessment; use ranking questions; probe for norms or rules)
- Question 8: How do you balance your work and personal life? (Probing strategies: ask for preferences or opinions; use indirect questions; probe for influences or pressures)
- Conclusion: Thank the participant for their participation. Ask if they have anything else to add. Explain the next steps of the study. Ask if they have any questions.

What do you think of this draft interview guide? 😊

Learn more: 1. books.google.com 2. global.oup.com 3. learninglink.oup.com

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Pretty good point of departure for a draft interview guide. Good robot.

Identifying relevant data

For larger projects or open-ended methods projects, it is usually quite a lot of work to sift through publicly available data or identify relevant companies or interviewees. Bing can be quite helpful here:

I am doing a project on european power-to-x strategies and I want to interview national regulatory agencies about their PtX strategies. Can you provide some leads on possible interviewees? If you cannot, then search for relevant documents that I can analyze instead.

I'm sorry but I cannot provide you with specific names of possible interviewees for your project. However, I can suggest some sources of information that might help you find them.

One source is the **Agency for the Cooperation of Energy Regulators (ACER)** ¹, which is an EU institution that helps ensure the single European market in gas and electricity functions properly. It assists national regulatory authorities (NRAs) in performing their regulatory function at European level and, where necessary, coordinates their work.

Another source is the list of **NRAs** ² ³ for each EU member state. These are the authorities that regulate the energy markets and consumers' rights in their respective countries. They might have some information on their PtX strategies or contacts who do.

A third source is some **academic papers** ⁴ ⁵ ⁶ that discuss PtX pathways and incentives for transport and industry sectors in Europe. They might provide some insights into the current state and challenges of PtX development and deployment.

I hope this helps you with your project. Good luck! 😊

Learn more:

1. [european-union.europa.eu](https://europa.eu)

2. energy.ec.europa.eu

3. acer.europa.eu

+3 more

1 of 10 ●

All right, fair enough. I know that Bing can actually search individual names, contact addresses and phone numbers, but I'm not going to show that here. However, it would be relatively easy to dive into the sources listed here, or to continue the conversation with Bing on the matter.

I want to find a case company for a study on power-to-X market strategies in the EU. Due to practical reasons, I can only analyze publicly available information, such as public documents, public interviews, public market analyses, or news articles. Please identify a few relevant possible case companies and list them according to how easy it is to find information about them.

I have found some possible case companies for your study on power-to-X market strategies in the EU. Here is a list of them according to how easy it is to find information about them:

- **European Energy** ¹: This is a Danish company that develops and operates solar and wind farms and converts renewable electricity into other forms of energy such as green hydrogen or green methanol. It has several PtX projects across Europe and publishes annual reports, press releases, newsletters, and webinars on its website.
- **P2X-Europe** ²: This is a German company that configures, builds and invests in vertically integrated end-to-end power-to-liquid technology solutions to produce synthetic net-zero eFuels and chemicals from renewable energy-derived hydrogen and biogenic carbon sources. It has a pilot plant in Germany and plans to expand to other countries. It provides some information on its website, but not much detail on its financial performance or market analysis.
- **MAN Energy Solutions** ³: This is a German company that offers sustainable solutions for synthetic fuel production and long-term energy storage using PtX technology. It launched a 50 MW comprehensive plant solution in 2013 and has several partnerships with other companies and institutions. It publishes some information on its website, but it is mainly focused on its technology rather than its market strategy.

I hope this helps you with your study. Good luck! 😊

Learn more: [1. europeanenergy.com](https://www.europeanenergy.com) [2. p2x-europe.com](https://www.p2x-europe.com) [3. man-es.com](https://www.man-es.com) [+3 more](#)

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Good point of departure for sifting through possible case companies. Thanks, Bing!

I want to compare two countries in terms of their hydrogen strategies. I want to sample two countries that are very similar, but have very different hydrogen strategies. Please search for country-level hydrogen strategies and suggest possible comparisons that could be relevant.

I have found some sources of information that might help you compare different countries in terms of their hydrogen strategies. Here are some possible comparisons that could be relevant:

- **China and Japan** ¹: These are two Asian countries that have different approaches to hydrogen development. China is focusing on producing hydrogen from coal and natural gas with carbon capture and storage (CCS), while Japan is aiming to import large amounts of low-carbon hydrogen from abroad, mainly Australia. China has a more ambitious target of reaching 60 GW of hydrogen production capacity by 2030, while Japan has a more modest goal of 10 GW by 2030.
- **France and Germany** ¹: These are two European countries that have similar goals but different priorities for hydrogen development. Both countries aim to achieve carbon neutrality by 2050 and see hydrogen as a key enabler for decarbonizing hard-to-abate sectors such as transport and industry. However, France is more focused on green hydrogen produced from renewable electricity, while Germany is more open to blue hydrogen produced from natural gas with CCS as a transitional solution.
- **Australia and New Zealand** ²: These are two Oceanian countries that have contrasting levels of commitment and investment for hydrogen development. Australia has a strong potential to become a major exporter of low-carbon hydrogen to Asia and Europe, thanks to its abundant renewable resources and existing gas infrastructure. It has allocated over USD 500 million for various hydrogen projects and initiatives. New Zealand, on the other hand, has a more limited role in the global hydrogen market, due to its small size and remote location. It has allocated only USD 20 million for its national green hydrogen strategy.

I hope this helps you with your comparison. Good luck! 😊

Learn more: [1. kpmg.com](#) [2. worldenergy.org](#) [3. kpmg.com](#) [4. kpmg.com](#) [+2 more](#)

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This is not bad. Of course, in social science, perfect comparisons never exist, but comparing France and Germany on their hydrogen strategy is a pretty good idea, given their relatively similar sizes and because they are both important members of the EU. But maybe we are not entirely satisfied with this:

Can you be more specific on countries that are very similar? For example, Sweden and Denmark are quite similar in size of country and economy. Alternatively, if that is not possible, please suggest the reverse: Comparisons of countries that are very different, yet have very similar hydrogen strategies.

I have found some information that might help you compare Sweden and Denmark in terms of their hydrogen strategies. Here is a brief summary:

- **Sweden** ¹: Sweden has a proposal for a national fossil-free hydrogen strategy that sets concrete goals and capacity targets for both 2030 and 2045. It aims to produce 10 TWh of green hydrogen by 2030 and 50 TWh by 2045, mainly from renewable electricity. It also plans to use hydrogen for transport, industry, power generation, and heating. It has allocated SEK 1 billion (USD 110 million) for hydrogen-related projects and initiatives.
- **Denmark** ² ³: Denmark is committed to releasing its national hydrogen strategy by the end of 2021. It has pledged to build up to 6 GW of electrolysis capacity to convert renewable power into green hydrogen by 2030. It also plans to use hydrogen for transport, industry, power generation, and heating. It has allocated DKK 150 million (USD 22 million) for hydrogen-related projects and initiatives.

As you can see, Sweden and Denmark are quite similar in size of country and economy, but they have different levels of ambition and investment for their hydrogen strategies.

Alternatively, if you want to compare countries that are very different yet have similar hydrogen strategies, you could look at **Canada** and **Chile**. Both countries aim to become global leaders in low-carbon hydrogen production and export by leveraging their abundant renewable resources (hydroelectricity in Canada and solar power in Chile). Both countries also plan to use hydrogen for domestic applications such as transport, industry, power generation, and heating. Both countries have set targets of producing up to 30 Mt of low-carbon hydrogen per year by 2050.

I hope this helps you with your comparison. Good luck! 😊

Learn more: [1. gh2.org](https://www.gh2.org) [2. nordichydrogenpartnership.com](https://nordichydrogenpartnership.com) [3. reuters.com](https://www.reuters.com)

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Of course, it is necessary to double-check that, for example, both Canada and Chile follow similar hydrogen strategies. However, rather than manually going through each country-level strategy, Bing gives you the most relevant ones up-front.

One underappreciated feature of Bing is that it searches in languages you don't speak, and then integrates that:

Search in the main language spoken in Chile on Chilean hydrogen strategies. Combine that with a regular search in English on Chilean hydrogen strategies. Then combine those searches to provide an overview of the Chilean national hydrogen strategy.

I don't even have to know what language they speak in Chile, I can simply ask Bing to figure it out for me. Note here that the *Search X, Search Y* strategy can combine searches in different languages to further enhance accuracy.

I have combined the searches in Spanish and English to provide an overview of the Chilean national hydrogen strategy. Here is a brief summary:

- **Chile** [1](#) [2](#) [3](#) [4](#): Chile has a national green hydrogen strategy that aims to make Chile a global leader in low-carbon hydrogen production and export by 2040. It has three main objectives:
 - To have 5 GW of electrolysis capacity under development by 2025, which would make Chile one of the largest producers of green hydrogen in the world.
 - To produce the most cost-efficient green hydrogen by 2030, by leveraging its abundant and cheap renewable energy resources, especially solar power.
 - To be among the top three exporters by 2040, by developing a competitive and diversified hydrogen market that can supply domestic and international demand.

The strategy also outlines several actions and initiatives to support these objectives, such as creating a regulatory framework, fostering innovation and R&D, promoting public-private partnerships, attracting investments, developing infrastructure and logistics, enhancing human capital and social acceptance, and ensuring environmental sustainability.

I hope this helps you with your overview. Good luck! 😊

Learn more: [1. bing.com](#) [2. energia.gob.cl](#) [3. energypartnership.cl](#) [+6 more](#)

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Generating ideas for data analysis

Suppose that you have your theoretical framework, you have your case, and you have your empirics. Great. What now? How do you actually run the analysis? Well, you can discuss that with Bing as well.

Let's suppose we are taking Barney's VRIS-framework - a classic text in management studies - and want to apply it to a case organisation to explain their competitive advantages. How should we go about structuring that analysis?

We are using Barney's VRIS-framework to analyse a company. We are in doubt on how to approach the analysis. Please search for ways to use the VRIS-framework to analyze company resources, then search for the specifics of Barney's original VRIS framework. Then use those searches to suggest an analytical structure. Additionally, provide a table indicating some ways the V, R, I and S could be used to analyze parts of the company.

Hello, this is Bing. I'm happy to help you with your analysis.😊

According to my web searches [1](#) [2](#) [3](#), the VRIO framework is a tool to evaluate an organization's resources and capabilities based on four criteria: value, rarity, imitability and organization. These criteria help determine whether a resource or capability can provide a sustainable competitive advantage for the organization.

The original VRIS framework was proposed by Jay Barney in 1991 [4](#) [5](#), and it included only three criteria: value, rarity and imitability. The fourth criterion of organization was added later by Barney in 1995 [5](#).

To use the VRIO framework to analyze company resources, you can follow these steps:

- Identify the key resources and capabilities of the company that are relevant to its vision, objectives and strategy.
- For each resource or capability, ask the four VRIO questions:
 - Is it valuable? Does it help exploit opportunities or neutralize threats in the market?
 - Is it rare? Is it possessed by few or no competitors?
 - Is it costly to imitate? Can competitors easily replicate or substitute it?
 - Is the organization aligned? Does the company have the policies, processes and culture to support and exploit it?
- Based on the answers, classify each resource or capability as a strength (VRIO), a temporary competitive advantage (VRI), a parity (VR), a competitive disadvantage (V) or irrelevant (none).
- Use this classification to identify which resources and capabilities need to be protected, enhanced, acquired or discarded.

Here is an example of a table that shows some ways the V, R, I and S could be used to analyze parts of the company:

Resource/Capability	Value	Rarity	Imitability	Organization	Classification
Brand name	Yes	Yes	No	Yes	Temporary competitive advantage
Patented technology	Yes	Yes	Yes	Yes	Strength
Customer loyalty	Yes	No	No	Yes	Parity
Skilled workforce	Yes	No	Yes	No	Competitive disadvantage

I hope this helps you with your analysis. Do you have any other questions?😊

Learn more: [1. clearpointstrategy.com](#) [2. questionpro.com](#) [3. onstrategyhq.com](#) [+4 more](#) 1 of 10

While this is technically true, we asked for the VRIS framework, not the VRIO framework. The difference is that VRIS is Barney's original 1991 contribution, while he expanded it into VRIO in 1995. But no worries, we can tell Bing that this is the case.

Interesting, but I think you are mixing up the VRIO and the VRIS framework. in VRIS, there is no "o", rather the "s" is for "substitutability". Please redo your last output based on this new information.

This is, of course, one of the reasons why the iterative principle is really useful here. Rather than stressing out, we can either just adapt manually or ask Bing to adapt accordingly.

I apologize for the confusion. You are right that the VRIS framework is different from the VRIO framework. According to my web searches [1](#) [2](#), the VRIS framework was proposed by Jay Barney in 1991, and it included four criteria: value, rarity, imitability and substitutability. The substitutability criterion refers to whether there are strategically equivalent resources that can perform a similar function as the resource in question [2](#).

To use the VRIS framework to analyze company resources, you can follow these steps:

- Identify the key resources and capabilities of the company that are relevant to its vision, objectives and strategy.
- For each resource or capability, ask the four VRIS questions:
 - Is it valuable? Does it help exploit opportunities or neutralize threats in the market?
 - Is it rare? Is it possessed by few or no competitors?
 - Is it costly to imitate? Can competitors easily replicate or substitute it?
 - Is it non-substitutable? Are there no strategically equivalent resources that can perform a similar function?
- Based on the answers, classify each resource or capability as a strength (VRIS), a temporary competitive advantage (VRI), a parity (VR), a competitive disadvantage (V) or irrelevant (none).
- Use this classification to identify which resources and capabilities need to be protected, enhanced, acquired or discarded.

Here is an example of a table that shows some ways the V, R, I and S could be used to analyze parts of the company:

Resource/Capability	Value	Rarity	Imitability	Substitutability	Classification
Brand name	Yes	Yes	No	No	Strength
Patented technology	Yes	Yes	Yes	No	Temporary competitive advantage
Customer loyalty	Yes	No	No	Yes	Parity
Skilled workforce	Yes	No	Yes	No	Competitive disadvantage

I hope this clarifies your doubt. Do you have any other questions? 😊

Learn more: [1. open.ncl.ac.uk](#) [2. open.ncl.ac.uk](#)

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This is a pretty good point of departure for thinking about how to structure your VRIS analysis. Combine with the earlier points about operationalization and then you have a pretty good draft for an analytical approach and structure.

Making a study plan

A simple challenge for many students, especially at the undergrad/bachelor level, is how to organise your time and effort in a way that allows you to learn something at university

without breaking your neck. Many universities offer student counselling, where professional counsellors can help you with structuring your life as a student. Let's use Bing to help us as well. First, let's have Bing tell us about the best available research on studying practice.

Hi Bing, I'm a university student who is curious about how to organize my time and effort to learn the most while also having time to enjoy life. What is the best available evidence in peer-reviewed research articles in terms of what techniques for studying that yield the best results?

Hi, I'm glad you're interested in learning how to study effectively. There are many techniques for studying that have been researched and proven to be effective by peer-reviewed articles. Some of the most common ones are:

- **Spaced repetition:** This means reviewing the material at different intervals over time, rather than cramming it all at once. This helps you remember it better and avoid forgetting it quickly [1](#) [2](#).
- **Active recall:** This means testing yourself on what you have learned, rather than just reading or highlighting it. This helps you strengthen your memory and identify any gaps in your understanding [1](#).
- **Desirable difficulties:** This means making your study sessions challenging but not too hard, such as using flashcards with different levels of difficulty, or mixing up different topics or formats. This helps you improve your learning and transfer it to new situations [1](#).
- **Elaboration:** This means explaining what you have learned in your own words, or connecting it to other concepts or examples. This helps you deepen your comprehension and make it more meaningful [1](#).
- **Interleaving:** This means switching between different topics or skills within a study session, rather than focusing on one at a time. This helps you enhance your ability to compare and contrast them and apply them flexibly [1](#).
- **Concrete examples:** This means using specific and relevant examples to illustrate abstract concepts or principles. This helps you make sense of them and remember them better [1](#).
- **Dual coding:** This means combining verbal and visual information, such as using words and diagrams or images. This helps you process the information more effectively and create multiple memory cues [1](#).

These are some of the best techniques for studying that are supported by evidence-based research. However, they may not work for everyone equally, so you should experiment with them and find out what works best for you.

Do you have any questions about these techniques? 😊

Learn more: [1. medschoolinsiders.com](#) [2. edutopia.org](#)

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All right, thanks Bing. It's clear that there are better practices than simply reading everything again and again and hoping it sticks. Let's figure out how to have Bing help us apply this at a course we are taking.

Thanks, Bing. I want to find a way to integrate spaced repetition and active recall with actually reading the curriculum. From september to december, I have a course on entrepreneurship run by Ethan Mollick, I think you can find the details online. Let's say that there are two lectures and two workshops per week, and I need to read in between while also integrating the techniques I mentioned. Can you draft a possible plan for how to do this on a weekly basis? I don't want to study friday evening anytime saturday.

You're welcome. I'm happy to help you plan your study schedule for the entrepreneurship course by Ethan Mollick. Based on the information I found online ¹, this course has four modules that cover different aspects of financing and profitability for startups. Each module has several videos, readings, quizzes, and assignments that you need to complete.

A possible plan for how to integrate spaced repetition and active recall with reading the curriculum could look something like this:

- **Monday:** Watch the first lecture video and take notes. Review your notes and test yourself on the main points. Read the first assigned reading and highlight or summarize the key ideas. Review your notes and test yourself on both the lecture and the reading.
- **Tuesday:** Watch the second lecture video and take notes. Review your notes and test yourself on the main points. Read the second assigned reading and highlight or summarize the key ideas. Review your notes and test yourself on both lectures and both readings.
- **Wednesday:** Attend or watch the first workshop video and participate in the activities or discussions. Review your notes from Monday and Tuesday and test yourself on all of them. Do some additional research on a topic related to the module if you are interested or curious.
- **Thursday:** Attend or watch the second workshop video and participate in the activities or discussions. Review your notes from Wednesday and test yourself on them. Do some additional research on a topic related to the module if you are interested or curious.
- **Friday:** Review all your notes from Monday to Thursday and test yourself on them using flashcards, quizzes, or other methods. Complete any assignments or projects that are due for this module.
- **Saturday:** Enjoy your day off! 😊
- **Sunday:** Review all your notes from Monday to Friday again using spaced repetition intervals (for example, review Monday's notes after 1 day, Tuesday's after 2 days, etc.). Test yourself again using active recall methods.

This is just an example of how you could organize your time and effort to learn effectively while also having time to enjoy life. You can adjust it according to your preferences, goals, workload, etc.

I hope this helps you with your studies! 👍

Learn more: [1. coursera.org](https://www.coursera.org)

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Thanks to Prof. Mollick for making sure Bing can find his syllabus (or a version of it) online. This is a pretty good start. This brings us directly into the next section:

Using Bing to test your own knowledge

As Bing told us before, spaced repetition combined with active recall is an excellent way to enhance learning. Active recall is the reason why all your standard textbooks have review questions at the end of every chapter. However, Bing can do this way more dynamically, and adapt it to your level. Let's try:

Thanks, Bing. I would like your help with designing some active recall on one of the core concepts of the course. Let's go with financing for entrepreneurs. I have read the material, but I'm really in doubt about all of it, as it seems quite abstract. I have a background in engineering, and this sounds way too much like business. Can you help me with some review questions or any other relevant type of active recall that fits with my background and level of understanding?

Here we are pretending to be an engineering student who is learning about entrepreneurship (a very common situation) and we want Bing to adapt the active recall to our situation.

Sure, I can help you with some review questions on financing for entrepreneurs. Financing is an important topic for any startup, as it involves raising and managing funds to support the business idea. There are different sources and methods of financing, each with its own advantages and disadvantages.

Here are some possible review questions that you can use to test your understanding of financing for entrepreneurs:

- What are the two main types of financing for small businesses or startups? [1](#)
- What is equity financing? What are some examples of equity financing sources? [1](#) [2](#)
- What is debt financing? What are some examples of debt financing sources? [1](#) [2](#)
- What is asset-based finance? How does it differ from debt and equity finance? [3](#)
- What are some framework conditions that affect SMEs' access to finance? [3](#)
- What are some advantages and disadvantages of venture capital as a source of finance for entrepreneurs? [4](#)
- What are some advantages and disadvantages of angel investors as a source of finance for entrepreneurs? [4](#)
- What are some advantages and disadvantages of bootstrapping as a source of finance for entrepreneurs? [4](#)
- What are some advantages and disadvantages of crowdfunding as a source of finance for entrepreneurs? [4](#)
- What are some advantages and disadvantages of grants and subsidies as a source of finance for entrepreneurs? [4](#)

These are some examples of active recall questions that you can use to review the material on financing for entrepreneurs. You can also create your own questions based on your notes, readings, or lectures. The key is to challenge yourself to recall the information without looking at it.

I hope this helps you with your studies! 😊

Learn more: [1. toppr.com](#) [2. ey.com](#) [3. oecd.org](#) [4. merchantmaverick.com](#)

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And then when we are done, we can ask Bing to give us the actual answers.

Sure, I can give you some indicative answers to each of the review questions. Please note that these are not comprehensive or definitive answers, but rather brief summaries of the main points. You should always refer to your course materials and instructor for more details and clarification.

- What are the two main types of financing for small businesses or startups?
 - The two main types of financing are equity financing and debt financing. Equity financing involves giving up a share of ownership or control in exchange for funds, while debt financing involves borrowing money that has to be repaid with interest.
- What is equity financing? What are some examples of equity financing sources?
 - Equity financing is a type of financing that involves selling a portion of the business to investors who become co-owners or shareholders. Some examples of equity financing sources are venture capital, angel investors, crowdfunding, and personal investment.
- What is debt financing? What are some examples of debt financing sources?
 - Debt financing is a type of financing that involves borrowing money from lenders who expect to be repaid with interest. Some examples of debt financing sources are bank loans, overdrafts, credit cards, and bonds.
- What is asset-based finance? How does it differ from debt and equity finance?
 - Asset-based finance is a type of finance that involves using the assets or receivables of the business as collateral for loans or advances. It differs from debt and equity finance in that it does not require giving up ownership or control, nor paying interest on the borrowed amount. However, it also exposes the business to the risk of losing its assets if it fails to repay.
- What are some framework conditions that affect SMEs' access to finance?
 - Some framework conditions that affect SMEs' access to finance are macroeconomic stability, financial market development and regulation, legal and institutional environment, taxation and public support policies.

I have shortened it for brevity, but Bing can absolutely keep answering all of the review questions. If Bing stops because of an output limit, you can always ask it to "Continue".

- What are some advantages and disadvantages of angel investors as a source of finance for entrepreneurs?
 - Some advantages of angel investors are: smaller amounts of funding available; more flexible terms; personal involvement and mentoring; faster decision making. Some disadvantages are: loss of control and ownership; high expectations and pressure; limited follow-on funding; difficulty and uncertainty in finding suitable investors.

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Continue

Okay, I will continue with the rest of the questions.

- What are some advantages and disadvantages of bootstrapping as a source of finance for entrepreneurs?
 - Some advantages of bootstrapping are: full control and ownership; low risk and debt; personal satisfaction and motivation; creativity and innovation. Some disadvantages are: limited funds and resources; slow growth and scalability; opportunity cost and trade-offs; stress and burnout.

For teachers: Guidance on using ChatGPT and Bing to improve teaching, enhance learning, and save time

As noted in the introduction, I believe that teachers and university institutions are responsible for adapting teaching content, format, and didactical approach to individualised AI tools. As of Spring 2023, most of the discussion among teaching staff relates to damage control on exam assignments. This is understandable, and while this document can help with this in some ways, the main usefulness of this document for teachers will be to integrate AI tools in teaching practice, to enhance the work done to plan and execute teaching, and to develop course material and content that matches the capabilities offered to students by the new AI tools.

This section will, like the rest of the document, undergo continuous revision as ChatGPT, Bing, and other AI tools become more advanced and specialised. Right now, there is no coherent set of ideas about how AI should or could be integrated into higher education, so as practice emerges and ideas and experiences are shared, I will make sure to update this section to reflect better and better knowledge on the subject.

I recommended reading [Mollick & Mollick 2023](#) for some ideas for how to use ChatGPT for exercises as well. However, I note that many elements covered in that paper are now superseded by using Bing, for example on concept application.

ChatGPT for teachers

For more general uses of ChatGPT, I refer to the section for students where many standard techniques are covered.

Anticipating student questions on material

A useful element of ChatGPT is that it is relatively decent at “imagining” what a specific type of person looks like in text format. We can use this to our advantage to let ChatGPT help us anticipate how certain types of students generally will respond to certain learning situations.

CR

I am a teacher at a university teaching political science. I want to anticipate some questions that my students might have about my curriculum. We have a session on Democracy, and we use Robert Dahl as the basis for the teaching. What are some things my students might ask me in the classroom? Please identify the most difficult parts about democracy as a concept as the basis for you answer.



As a teacher of political science, there are several questions that your students might ask you during a session on Democracy, especially when using Robert Dahl's works as a basis for the teaching. Here are some of the most common questions that students may ask and some of the most challenging aspects of democracy as a concept:

1. What is democracy, and how does it differ from other forms of government?

Democracy is a form of government where citizens have a say in how they are governed. It is based on the principle of equality, where each person has an equal say in the decision-making process. It is different from other forms of government, such as dictatorship or monarchy, where power is held by a single person or a small group of people.

One of the most challenging aspects of democracy is defining it in a way that is broad enough to encompass different types of democracies while being specific enough to differentiate it from other forms of government.

Here, I have cut it off for brevity, but it goes on with several extra questions. Now let us specify a bit more. I ask ChatGPT to imagine specifically what students from lower-income households with less academic literacy might ask:

CR

Some of my students are from lower-income households, and this will be the first time they come in contact with the abstract ideas about 'democracy' as a concept. What are some questions they might have? 



It's important to anticipate questions that students from different backgrounds may have when teaching abstract concepts like democracy. Here are some possible questions that students from lower-income households might have:

1. How does democracy affect me, and what can I do to participate in it?

Students from lower-income households may feel disconnected from the political process and may wonder how democracy affects their daily lives. They may also be unsure of how they can participate in the democratic process, given their socioeconomic status.

As a teacher, you can help students understand the importance of democracy in shaping policies that affect their lives and encourage them to participate in the political process by registering to vote, attending community meetings, or contacting their elected representatives.

2. How does economic inequality affect democracy, and what can be done to address it?

Students from lower-income households may be more likely to experience economic inequality and may question how this affects democracy. They may also be interested in learning about policies that address economic inequality and promote greater equality of opportunity.

As a teacher, you can help students understand the relationship between economic inequality and democracy, and discuss policies that can promote greater economic equality, such as progressive taxation, public education, and social safety nets.

As you can see, this is a different take on the question. ChatGPT also provides some guidance, which may be useful for a starting point. What about students that struggle with academic concepts?

CR

Now redo it, but focus on questions from students who have a more difficult time engaging with abstract academic concepts.



It's important to anticipate questions from students who may have difficulty engaging with abstract academic concepts like democracy. Here are some possible questions that these students might have:

1. What does democracy mean, and why is it important?

Students who have difficulty engaging with abstract academic concepts may be unfamiliar with the term "democracy" and may not understand why it is important.

As a teacher, you can help students understand the definition of democracy as a system of government that allows citizens to participate in the decision-making process. You can also explain the importance of democracy in promoting individual rights and freedoms, ensuring fair representation, and holding elected officials accountable to the people.

2. How does democracy work in practice, and what are some examples of democratic countries?

Students who have difficulty engaging with abstract academic concepts may benefit from concrete examples of how democracy works in practice.

As a teacher, you can provide examples of democratic countries, such as the United States, Canada, and Western European countries. You can also explain how democratic institutions, such as elections, the judiciary, and the press, work to promote democracy.

Not groundbreaking, but useful nevertheless. Adapt your ChatGPT prompt to accommodate your class composition and play around with ChatGPT's creative ideas.

Simulating class discussions for inspiration

ChatGPT is really good at creating imaginary dialogues, even when compared to Bing due to Bing's limitations on input, output, and length limit. You can use ChatGPT to simulate dialogues between you, students, or anyone else to get ideas for how to structure in-class discussions.

CR

I am a teacher and I want to simulate a discussion between me and the students on the topic of sustainable business. The discussion will be on the question, "can businesses be expected to help society, or can we only expect them to optimize profits?" and the students are master-level students with extensive knowledge about business strategy, CSR, ESG, and social science in general. Simulate the discussion with me and two students, where I act as a socratic facilitator. The students will have different viewpoints on the matter.

Recall the principle that, *ceteris paribus*, more precise prompts will yield more precise outputs.



Great! Let's begin the discussion.

Me: Hello everyone, today we will be discussing the question, "can businesses be expected to help society, or can we only expect them to optimize profits?" Let's start by hearing some initial thoughts from our two students.

Student 1: I believe that businesses have a responsibility to help society beyond just maximizing profits. Companies have the ability to make a significant positive impact on society, and it is their responsibility to do so. This is especially true when considering the environmental and social issues we face today.

Student 2: While I agree that businesses can have a positive impact on society, I don't believe it's their primary responsibility. The primary responsibility of a business is to maximize profits for their shareholders. If they happen to make a positive impact on society along the way, that's great, but it shouldn't be their main focus.

Me: Thank you both for your initial thoughts. Student 1, can you expand on why you believe that businesses have a responsibility to help society?

Student 1: Of course. As I mentioned earlier, companies have the ability to make a significant positive impact on society. They have the resources, the expertise, and the reach to address many of the environmental and social issues we face today. Additionally, businesses operate within society and depend on society for their success, so they should be invested in improving the well-being of society.

Me: Interesting perspective. Student 2, what is your response to Student 1's argument?

Student 2: While I see where Student 1 is coming from, I still believe that a company's primary responsibility is to its shareholders. Maximizing profits is what allows a company to continue operating and employing people. Without that focus, the company could potentially fail, and then it wouldn't be able to help society at all.

Me: I see. Student 1, do you have a response to Student 2's argument?

Student 1: Yes, I understand the importance of maximizing profits for a company's survival. However, I believe that companies can still prioritize social responsibility and sustainability while also making a profit. In fact, I believe that companies that prioritize these values are often more successful in the long run, as they build a positive reputation and attract socially conscious consumers.

Me: Those are valid points. Student 2, do you have any further thoughts on this?

ChatGPT has a relatively optimistic perspective on how debates like this play out. Nevertheless, this is pretty good for inspiration and anticipation for how to facilitate a

discussion, understand what possible points of views students are bringing in, and consider formats for discussion.

Test out possible answers to simple questions (exam & non-exam)

Since ChatGPT is really good at making standard Anglo-Saxon paragraphing and argument structures, you can use it to test out how a good student might approach answering a given question (but see later on the Bing section how it can be done even better). Suppose that we have a simple essay and we are wondering what some possible ways to answer that essay question could be.

 I am a teacher with an essay question for my students, and I want to know how a student might answer it. Please take this essay question and provide a two-paragraph answer to it.

Question: "Should AI capabilities be an integrated part of management teaching? Explain and justify your position."

 The integration of AI capabilities into management teaching is a topic of increasing relevance in today's rapidly evolving business landscape. Proponents of this integration argue that AI can provide students with valuable insights into the potential for automation, data analysis, and decision-making, enabling them to better understand how to apply these tools in their future careers. However, opponents of this integration argue that reliance on AI may ultimately hinder critical thinking and innovation in management, as well as lead to the replacement of human workers with automated systems.

In my opinion, while AI capabilities certainly have the potential to be useful in management teaching, their integration should be approached with caution. On one hand, AI can provide students with a more comprehensive understanding of the possibilities and limitations of automation, allowing them to make more informed decisions about its use in their future careers. Additionally, AI can assist students in analyzing data, identifying patterns and trends, and making predictions, all of which are valuable skills for management professionals. However, it is important to recognize the limitations of AI and the potential negative impacts on human innovation and creativity. As such, management teachers should focus on integrating AI capabilities in a way that supports critical thinking and encourages students to consider the potential impacts of automation on workers and society as a whole.

It is a classic feature of ChatGPT that it usually tries to deliver nuanced and relatively balanced responses to complex questions. But simply posing a question and then watching how ChatGPT would attack it is usually a pretty good indicator for how a really good student might think about answering the question. Here, you can of course iterate on the output and ask ChatGPT to produce an answer from a specific position.

Generating tailored teaching material

For the rest of this chapter, I'll be using GPT-4. Thus, it should exhibit some higher quality reasoning and output, especially when compared with the previous sections.

One of the time-consuming tasks that does require teaching expertise is the effort needed to turn knowledge into teaching material that fits with the target audience. I would not expect to explain the basics of the Dynamic Capabilities framework the same way to a first year student, a master student, or a professional working in industry taking a one-off university course. Sometimes, we teachers are blindsided by our own bias, since we are (mostly) experts on the topics being taught. That can make it difficult to tailor the material and explanations to a particular type of student.

Let's have ChatGPT help us with that:

CR

I am going to explain Teece et al's idea about dynamic capabilities to two types of student. Type A are 2nd year bachelor students at the general management bachelor program. Type B students are diploma students with professional experience but no or very little academic training.

Please provide some ideas for how to explain dynamic capabilities to both types of students. For context, they are all students at Copenhagen Business School.



Explaining Dynamic Capabilities to Type A students (2nd year bachelor students in general management):

1. Start with the basics: Begin by explaining the concept of capabilities, which refers to a company's ability to utilize its resources effectively. Then, introduce dynamic capabilities as the specific abilities that allow companies to adapt, integrate, and reconfigure their resources and capabilities in response to a changing environment.
2. Relate to familiar concepts: Connect dynamic capabilities to concepts they have already studied, such as competitive advantage and core competencies. Explain how dynamic capabilities help businesses maintain a competitive edge by adapting to changes in the market, technology, or customer preferences.
3. Provide examples: Share case studies or examples of companies that have successfully implemented dynamic capabilities, such as Apple's transition from computers to mobile devices or Netflix's shift from DVD rental to streaming services.
4. Discuss the three main components: According to Teece et al., dynamic capabilities consist of sensing, seizing, and transforming. Define these components and provide examples to illustrate each.
5. Encourage group discussion: Divide the students into groups and ask them to identify dynamic capabilities in different industries. This will help them apply the concept to real-life scenarios.

Good start. That makes a lot of sense. What about type B students?

Explaining Dynamic Capabilities to Type B students (diploma students with professional experience but limited academic training):

1. Link to their professional experience: Begin by asking students to share their experiences in adapting to change in their professional lives. Use these examples as a foundation to introduce the concept of dynamic capabilities as a strategic tool that businesses use to adapt and thrive in a changing environment.
2. Use simple language: Avoid jargon and complex terminology. Explain dynamic capabilities as the skills and processes that help a company adjust its resources and strategies in response to changes in the market, technology, or customer preferences.
3. Focus on practical application: Discuss how dynamic capabilities can be developed and implemented in an organization. Talk about the importance of organizational learning, innovation, and collaboration in fostering dynamic capabilities.
4. Share real-life examples: Provide examples of companies that have effectively utilized dynamic capabilities to maintain their competitive advantage, such as Tesla's continuous innovation in electric vehicles or Amazon's expansion into various market segments.
5. Engage in hands-on activities: Develop interactive exercises, such as case study analysis or role-playing, where students can apply the concept of dynamic capabilities to specific business situations. This will help them understand the practical implications of the concept and build their problem-solving skills.

Very good. It's clear that ChatGPT understands the inherent difference in the types of audience. If we wanted to, we could have ChatGPT further develop the material to make it more tailored. We could, for example, specify the usage in a very narrow course setting:

CR

Great. Some of my students are taking a course specifically aimed at people with engineering backgrounds and no prior management training. Many of them have PhD's and Master degrees in natural science and STEM, but they have neither had management training or theories, nor do they have a strong grasp of practical management. Also, many of them work in pharma. How should I go about explaining dynamic capabilities to them? Outline your thoughts and provide an example of how I could explain it, with examples

This is a fun challenge, because we have students who have a very deep expertise in STEM domains, but who are completely unfamiliar with management studies and social science theories. So I'm quite interested in learning about how to present dynamic capabilities to this group of students.

What does ChatGPT say?



Explaining Dynamic Capabilities to students with engineering backgrounds and no prior management training:

1. Begin with familiar concepts: Start by discussing innovation and adaptability in engineering and STEM fields. Explain how these concepts are crucial for organizations in all industries, including pharma, to stay competitive and succeed.
2. Introduce dynamic capabilities: Define dynamic capabilities as the set of skills and processes that enable an organization to adapt to changes in the market, technology, or customer preferences. Explain that these capabilities are particularly important in industries that require constant innovation, such as pharma.
3. Connect to their expertise: Emphasize the importance of leveraging technical knowledge and skills to drive innovation and change within organizations. Highlight the role of interdisciplinary collaboration, such as between engineers, scientists, and management professionals, in developing dynamic capabilities.
4. Focus on the three main components: Explain sensing, seizing, and transforming as the core components of dynamic capabilities. Use examples from the pharma industry to illustrate each component:
 - a. Sensing: Early identification of new trends or opportunities, such as the development of personalized medicine or the integration of digital technology in drug discovery.
 - b. Seizing: Capitalizing on these opportunities by investing in research and development, forming strategic partnerships, or acquiring new capabilities, such as a biotech company acquiring a digital health startup to enhance its drug development process.
 - c. Transforming: Adapting the organization's resources and capabilities to effectively implement new strategies, such as shifting resources from traditional drug development to biologics or gene therapies.
5. Provide relevant case studies: Share examples of pharma companies that have successfully implemented dynamic capabilities, such as Pfizer's development of the COVID-19 vaccine in record time or Novo Nordisk's continuous innovation in diabetes care.
6. Encourage problem-solving and discussion: Engage students in activities that challenge them to apply dynamic capabilities to specific challenges or opportunities within the pharma industry. For instance, discuss how a company could respond to the rise of digital therapeutics or personalized medicine.
7. Emphasize the value of their background: Reiterate that their technical expertise and problem-solving skills can be valuable assets in the development and implementation of dynamic capabilities, especially in industries like pharma that require a deep understanding of complex scientific and technological issues.

Pretty good ideas, I would say. It's clear that, not only does ChatGPT have a very well-developed understanding of the underlying concept, but it can also accentuate the different elements of the theory that is relevant from a didactical point of view to get the message across to a certain type of students.

Ask students to peer-grade ChatGPT

First, let's have ChatGPT remind us what peer-grading is.



Peer-grading, also known as peer assessment or peer evaluation, is an educational practice in higher education where students assess, evaluate, or grade their peers' work. This approach is typically used to complement traditional instructor-led grading or as a standalone method, particularly in large classes or online courses where individualized feedback from instructors may be more challenging to provide.

Peer-grading can offer various benefits, including:

1. Enhanced learning: By evaluating the work of their peers, students can deepen their understanding of the subject matter, learn from others' perspectives, and develop critical thinking skills.
2. Improved feedback: Peer-grading can provide diverse viewpoints, as students may notice different aspects or provide unique insights based on their own experiences and understanding.
3. Time and resource efficiency: In large classes or online courses, peer-grading can be an efficient way to distribute the grading workload, freeing up instructors to focus on other aspects of teaching and learning.
4. Skill development: Engaging in peer-grading helps students develop important skills such as communication, collaboration, and empathy, which are valuable for their future careers and personal growth.
5. Greater sense of responsibility: When students know that their peers will be evaluating their work, they may be more motivated to put forth their best effort.

However, there are also potential challenges associated with peer-grading, such as concerns about fairness, accuracy, and bias. To address these issues, educators often implement structured guidelines, rubrics, or training sessions to help ensure that students provide consistent, fair, and constructive feedback.

Evidently, you can see how thorough GPT-4 is in its consideration on the subject. As it correctly notes, there are some concerns about using peer grading. In practice, peer grading is rarely done with a view to actually grade it, but I find that it's difficult to organise at scale. So let's have a bit of fun.



Provide some ideas for ways to integrate ChatGPT into a peer-grading process to enhance student learning and increase interactivity and efficiency of the teaching process

This question did actually not provide a lot of interesting ideas, because ChatGPT just transplanted itself into the regular way of doing peer grading, which isn't too relevant. So instead, I asked it the following:



I want you to be creative in terms of how the capabilities of ChatGPT can be used to develop new ways of conducting peer-grading. Be creative!

And ChatGPT's response:



Certainly! Here are some creative ways to utilize ChatGPT's capabilities for conducting peer-grading:

1. Interactive feedback sessions: ChatGPT could facilitate virtual interactive feedback sessions where students discuss and provide feedback on each other's work in a guided, structured manner. The AI can dynamically adapt to the conversation, prompting students with insightful questions, offering helpful suggestions, and ensuring that everyone stays engaged and on topic.
2. Gamification of peer-grading: ChatGPT could be used to develop a gamified approach to peer-grading, where students earn points or rewards for providing constructive feedback, identifying specific areas for improvement, and demonstrating an understanding of the material. The AI can track progress, provide real-time feedback, and generate leaderboards to encourage friendly competition and enhance motivation.
3. Collaborative improvement: ChatGPT can facilitate a collaborative editing process where students work together to improve a shared document, with the AI offering suggestions, answering questions, and providing guidance. This approach promotes collective learning and can help students learn from each other's strengths and weaknesses.
4. Role-playing scenarios: ChatGPT can create role-playing scenarios in which students assume different roles (e.g., editor, reviewer, author) to engage in the peer-grading process. By adopting different perspectives, students can develop empathy and a deeper understanding of the evaluation criteria and the importance of constructive feedback.
5. Adaptive peer-grading: ChatGPT can use its understanding of each student's strengths and weaknesses to create personalized peer-grading pairs or groups. This can ensure that students are matched with peers who can provide the most relevant and constructive feedback for their specific needs.
6. Creative feedback formats: ChatGPT can help students explore alternative ways to provide feedback, such as creating multimedia presentations, recording audio feedback, or producing short videos. By encouraging creativity and diverse feedback formats, the AI can help make the peer-grading process more engaging and enjoyable.
7. AI-generated case studies: ChatGPT can create fictional case studies or sample assignments for students to practice their peer-grading skills. By working with a variety of scenarios, students can become more adept at providing constructive feedback and gain exposure to different perspectives and approaches.
8. ChatGPT as a mediator: ChatGPT can act as a neutral third party to review and compare students' feedback on a specific assignment. The AI can then synthesize the various perspectives, highlighting common themes, discrepancies, and areas of agreement or disagreement. This can lead to more nuanced and comprehensive feedback for the student whose work is being evaluated.

By using ChatGPT in these creative ways, educators can revolutionize the peer-grading process, making it more engaging, dynamic, and effective for students.

All of these ideas are interesting and probably worth at least some experimentation. Let's go with the most straightforward one, namely point 7, where ChatGPT generates content that students can peer grade.



Great, please unfold how we could conduct point 7 where ChatGPT develops material that students can then work on



To implement point 7, where ChatGPT generates fictional case studies or sample assignments for students to practice their peer-grading skills, follow these steps:

1. Determine the learning objectives: Identify the specific learning objectives or skills you want students to develop through the peer-grading exercise, such as critical thinking, problem-solving, communication, or empathy.
 2. Select the subject matter: Choose the subject matter or topic that the fictional case study or sample assignment should address. This should be relevant to the course content and aligned with the learning objectives.
 3. Generate case studies or sample assignments: Use ChatGPT to create fictional case studies or sample assignments based on the selected subject matter. Provide the AI with relevant information, context, and specific requirements for the task. Ensure that the generated material is diverse, engaging, and appropriately challenging for your students.
 4. Review and refine the material: Before distributing the material to students, review and refine the generated case studies or sample assignments to ensure they meet the desired learning objectives and quality standards. You can collaborate with ChatGPT to make any necessary adjustments.
 5. Create a peer-grading rubric: Develop a clear and comprehensive rubric to guide students through the peer-grading process. The rubric should outline the evaluation criteria, expectations, and guidelines for providing constructive feedback. ChatGPT can assist in the development of the rubric, offering suggestions and examples based on best practices.
 6. Organize students into pairs or groups: Divide students into pairs or small groups, ensuring a diverse mix of perspectives and experiences. Assign each pair or group a case study or sample assignment to work on.
 7. Conduct the peer-grading exercise: Have students read, analyze, and evaluate the assigned case study or sample assignment using the provided rubric. Encourage them to discuss their thoughts and observations, ask questions, and provide constructive feedback to their peers.
 8. Facilitate reflection and discussion: After the peer-grading exercise, bring the class together for a debriefing session. Encourage students to share their experiences, discuss the feedback they received, and reflect on what they learned from the exercise. ChatGPT can be integrated into this conversation to provide additional insights, answer questions, or stimulate further discussion.
 9. Assess student learning: Evaluate students' performance during the peer-grading exercise, considering their understanding of the material, ability to provide constructive feedback, and engagement in the process. Use this information to inform future instruction and support students' ongoing growth and development.
- By following these steps, educators can leverage ChatGPT to create engaging and effective peer-grading exercises that help students develop essential skills and deepen their understanding of course content.

This is a pretty solid workflow for this task. Note that ChatGPT highlights that you should review the AI output so that it works with the aim of the class and conforms to quality requirements. Let's try it out! For this, I'm taking some learning objectives from a course I know quite well.

CR Great! Let's make an exemplary piece of text. Here's the necessary information:

Topic: Research design and qualitative methods

learning objectives:

- Comprehend, identify and evaluate the basic concepts, terms, and positions around issues of ontology and epistemology.
- Assess the strengths and limitations of different qualitative methods when applied to a given research problem.
- Apply qualitative methods to a research problem and account for the relationship between theory, method, data collection, and analysis by producing a research design that is able to link a research question to qualitative methods and empirical data.
- Demonstrate applied skills and apply methodologically informed analyses to a research question in the field of international business and politics.
- Critically reflect on how to analyze and report qualitative research and assess its validity and reliability.

Type of product and purpose: ChatGPT should develop a sample research design for a hypothetical study doing a single case study. There should be some methodological flaws or elements that are missing. It should be at a difficulty level appropriate for a first year bachelor student.

Please develop the material according to these instructions.

The logic here is to take real-life learning objectives from [this course](#) so ChatGPT knows about what our students should learn, and then make some text where there (hopefully) are some oversights that students can identify.

CR Title: The Impact of Corporate Social Responsibility on Local Communities: A Single Case Study of XYZ Corporation

Sample Research Design:

1. Introduction

This research study aims to investigate the impact of corporate social responsibility (CSR) initiatives on local communities, focusing on XYZ Corporation as a single case study. The research will explore how XYZ Corporation's CSR initiatives affect the social, economic, and environmental aspects of the local community and identify potential areas for improvement in their CSR strategy.

2. Research Question

How do XYZ Corporation's CSR initiatives impact the local community in terms of social, economic, and environmental aspects, and how can these initiatives be improved to better serve the community?

3. Ontology and Epistemology

The ontological position of this research is realism, assuming that a real-world impact of CSR initiatives exists and can be studied. The epistemological stance is interpretivism, aiming to understand and interpret the perceptions, experiences, and meanings that stakeholders attribute to CSR initiatives.

4. Methodology

A single case study approach will be used to explore the impact of CSR initiatives of XYZ Corporation on the local community. The case study will rely on qualitative methods to collect and analyze data.

5. Data Collection

Data will be collected using semi-structured interviews with stakeholders from XYZ Corporation and the local community. A total of 10 interviews will be conducted, including five with XYZ Corporation's CSR team and five with representatives from the local community.

6. Data Analysis

Thematic analysis will be used to identify patterns, themes, and relationships in the interview data. The findings will be organized around the social, economic, and environmental impacts of XYZ Corporation's CSR initiatives and potential areas for improvement.

7. Limitations

This research design has several limitations:

- The sample size for interviews is small, which might not provide a comprehensive understanding of the perspectives of all stakeholders involved.
- The single case study approach limits the generalizability of the findings to other contexts or organizations.
- The research does not include a triangulation of methods or data sources, which might compromise the validity and reliability of the findings.

8. Conclusion

This research aims to provide insights into the impact of CSR initiatives on local communities and identify potential areas for improvement in CSR strategies. The findings could inform future CSR initiatives for XYZ Corporation and contribute to a better understanding of the role of businesses in promoting sustainable development.

Note: This sample research design contains some methodological flaws or missing elements, such as a small sample size, limited generalizability due to the single case study approach, and lack of triangulation. This material is designed to help first-year bachelor students practice their peer-grading skills by identifying and evaluating these issues in the research design.

Interesting. Take a moment yourself to evaluate this output. What's missing? What's wrong?

CR

Interesting. Could you elaborate on which parts that are wrong or missing? I would like a benchmark for what my students should identify as weaknesses in this text



Certainly! Here are some specific weaknesses and missing elements in the sample research design that your students should be able to identify:

1. Small sample size: The research design proposes conducting 10 interviews, with five from XYZ Corporation's CSR team and five from the local community. This small sample size may not provide a comprehensive understanding of the perspectives of all stakeholders involved, which could limit the depth and validity of the findings.
2. Single case study approach: The research focuses on a single case study of XYZ Corporation. While case studies can provide valuable insights, the findings from one organization may not be generalizable to other contexts or businesses. This limitation should be acknowledged, and the rationale for selecting a single case study should be clearly explained.
3. Lack of triangulation: The research design relies solely on semi-structured interviews as a data collection method, which might compromise the validity and reliability of the findings. Triangulation, or using multiple methods and data sources, could strengthen the research design by providing a more comprehensive and robust understanding of the topic. For example, incorporating document analysis, observations, or focus groups could enrich the data and offer additional perspectives.
4. Incomplete methodology: The methodology section does not fully explain the rationale for selecting a qualitative approach and a single case study design. It should provide more details on why these choices are suitable for addressing the research question and objectives, as well as any potential biases or limitations that may arise from the chosen methodology.
5. Theoretical framework: The research design does not clearly articulate the theoretical framework that will guide the analysis and interpretation of the data. A well-defined theoretical framework helps to contextualize the research question, connect it to existing literature, and inform the data analysis process.
6. Ethical considerations: The research design does not address ethical considerations related to conducting interviews with stakeholders or handling sensitive information. It is important to discuss how informed consent will be obtained, how confidentiality and anonymity will be maintained, and any potential risks or benefits to the participants.

By identifying these weaknesses and missing elements in the sample research design, your students can practice their critical thinking and peer-grading skills while developing a deeper understanding of the research process.

Some of these I would not expect my students to hit, and some of those are not applicable given the scope of the task. ChatGPT is also not necessarily right about sample size, because if you take an interpretivist perspective sample size is not that interesting. Some of the things are really interesting, like the lack of ethical or theoretical considerations. So we could immediately take this document as a point of departure and either file some things off or edit some things. Let's develop it a little further.

CR

Make a paragraph about the interview practice of this fictional study. Make sure to make some very clear and obvious mistakes in the explanation of how interviews were conducted in the study.



In this fictional study, the interview process was conducted in an informal and unstructured manner. The researchers randomly approached stakeholders from XYZ Corporation and the local community without scheduling appointments or obtaining informed consent. Instead of using a predetermined interview guide, the researchers initiated conversations and asked interviewees to share their thoughts about the company's CSR initiatives on the spot. No audio recordings or notes were taken during the interviews, as the researchers relied solely on their memory to recall the information shared by the participants. The interview data was not transcribed or systematically analyzed, and confidentiality of the participants was not assured. The researchers did not discuss any ethical considerations or provide a debriefing after the interviews were completed.

Okay okay ChatGPT, I get it, I get it. These interviews were pretty bad. Following the principle of iteration, we can develop:

CR

Moderate it so that some parts of the interview practice is very good, while a few things are either missing or done incorrectly.



In this fictional study, the interview process was carefully planned and structured. The researchers identified and selected stakeholders from XYZ Corporation and the local community based on their relevance to the research topic. Prior to conducting the interviews, the researchers obtained informed consent from all participants, ensuring that they understood the purpose of the study, their rights, and the voluntary nature of their participation.

A semi-structured interview guide was developed, consisting of open-ended questions designed to encourage participants to share their thoughts and experiences related to the company's CSR initiatives. The interview guide also allowed for flexibility in the conversation, enabling researchers to explore emerging themes and ask follow-up questions.

The interviews were conducted in a private setting to ensure confidentiality and make participants feel comfortable sharing their perspectives. However, the researchers did not audio record the interviews, relying instead on handwritten notes to document the conversations. This approach may have introduced inaccuracies or omitted important details in the data collection process.

After the interviews, the researchers thanked the participants for their time but did not provide a debriefing or an opportunity for participants to ask questions or clarify their responses. Additionally, the researchers did not discuss any plans for member checking or sharing the study's findings with the participants, which could have further enhanced the validity and trustworthiness of the research.

Interestingly, it seems ChatGPT is either pretty good or really bad.

CR What would you say the mistake is (are) in this text?

 In the provided text, there are a couple of mistakes related to the data collection process during the interviews:

1. No audio recordings: The researchers relied on handwritten notes instead of audio recordings to document the interviews. This approach can lead to inaccuracies, omissions, or misinterpretations of the participants' responses, potentially affecting the validity and reliability of the study's findings. Audio recording interviews, with participants' consent, is a more accurate method for capturing the conversations and allows for verbatim transcription, which is essential for rigorous data analysis.
2. No debriefing or member checking: After the interviews, the researchers did not provide a debriefing session, which would have allowed participants to ask questions, clarify their responses, or address any concerns. Furthermore, the researchers did not mention plans for member checking, a process in which participants review and verify the researchers' interpretations of their responses. Member checking is an important technique for ensuring the accuracy, credibility, and trustworthiness of qualitative research findings.

Addressing these mistakes by incorporating audio recordings and engaging in debriefing sessions and member checking would strengthen the research design and enhance the overall quality of the study.

Evidently, ChatGPT defaults to ethical or practical considerations in this case. I find these interactions quite interesting, because even the initial response above could provide for a very interesting discussion with students.

Bing for teachers

Many of the capabilities of bing for teachers are, in a sense, extended versions of the use-cases for students. The fun challenge for teachers lies in how to leverage the capabilities of Bing to create better teaching while taking into account that students also have access to the same tools *by using the very same tools to develop the teaching content and structure.*

Generating exams with Bing

Since Bing can search and can integrate well-known concepts reasonably well, we can ask Bing to come up with possible exam questions. The more context we give Bing, the better we can target the draft exam questions.

Suppose that we are developing an exam for a standard 4-hour closed book sit-in exam in managerial economics. This is a relatively tedious exercise, because it has to be different every year, often has to differ across classes and programs unless they all take the exam simultaneously, and it has to include the same elements every year. So, naturally, it would be pretty cool if we could just have Bing do it for us, right?

I am developing an exam case for managerial economics. We are using the Scheibye and Bentzen textbook as the basis. I want to develop a simple case for undergrad business students. Focus should be on managerial decisions and the assumptions that are necessary for analyzing markets, rather than the math; however, there should be some mathematical operations as part of the case. Please make a draft exam case (max 300 words) involving a company that has to optimize its production in the short run. Use labor (L) as the factor that is to be optimized.

Note the specification here that it has to be less than 300 words. I'm not sure that Bing always obeys commands like this, but specifying word length on the output definitely impacts Bing's output length in some way.

Here is a draft exam case based on your request:

Case: ABC Inc.

ABC Inc. is a company that produces widgets using labor (L) and capital (K) as inputs. The company operates in a competitive market and sells each widget for \$10. The company's production function is given by $Q = 10L^{0.5} K^{0.5}$, where Q is the output of widgets.

The company has a fixed amount of capital, $K = 100$, in the short run. The wage rate for labor is \$20 per hour.

The company wants to maximize its profit in the short run by choosing the optimal amount of labor.

Questions:

1. What is the marginal product of labor (MPL) for ABC Inc.? [1](#)
2. What is the marginal revenue product of labor (MRPL) for ABC Inc.? [1](#)
3. How many hours of labor should ABC Inc. hire to maximize its profit in the short run? [1](#) [2](#)
4. What is the maximum profit that ABC Inc. can earn in the short run? [1](#) [2](#)
5. What are some assumptions that are necessary for analyzing this case? [3](#)

Learn more:

[1. en.wikipedia.org](#) [2. britannica.com](#) [3. investopedia.com](#) [+4 more](#)

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Very good. We can immediately lift this and use it as an exam case. But why stop there?

Can you provide a set of indicative answers to the five questions? No need to be specific about calculations, just be precise about the method for calculating and the correct answer.

Sure, here are some indicative answers:

1. The marginal product of labor (MPL) is the additional output produced by one more unit of labor, holding capital constant. It can be calculated by taking the partial derivative of the production function with respect to labor: $MPL = dQ/dL = 5K^{0.5} L^{-0.5}$. Plugging in $K = 100$, we get $MPL = 50/L^{0.5}$.
2. The marginal revenue product of labor (MRPL) is the additional revenue generated by one more unit of labor, holding capital constant. It can be calculated by multiplying the marginal product of labor by the price of output: $MRPL = MPL * P = 50/L^{0.5} * 10 = 500/L^{0.5}$.
3. To maximize profit in the short run, ABC Inc. should hire labor until the marginal revenue product of labor equals the wage rate: $MRPL = W$. Solving for L , we get $L^{0.5} = 500/W = 500/20 = 25$. Therefore, $L = 25^2 = 625$ hours.
4. The maximum profit that ABC Inc. can earn in the short run is given by total revenue minus total cost: $\text{Profit} = TR - TC$. Total revenue is equal to price times quantity: $TR = P * Q = 10 * Q$. Total cost is equal to fixed cost plus variable cost: $TC = FC + VC$. Fixed cost is the cost of capital times its rental rate: $FC = rK$ (we assume r is given). Variable cost is the cost of labor times its wage rate: $VC = WL$. Plugging in the values and using $Q(L,K)$ from the production function, we get $\text{Profit}(L,K) = 10 * (10L^{0.5} K^{0.5}) - rK - WL$.

To find the maximum profit, we plug in L^* and K from question 3 and question A respectively:

$\text{Profit}(L^*,K) = 10 * (10 * (25)^{0.5} * (100)^{0.5}) - r(100) - W(625)$. Simplifying and using $W=20$ and $r=15$ as examples, we get $\text{Profit}(L^*,K) \approx \$1,414$. 5) Some assumptions that are necessary for analyzing this case are:

- The production function exhibits constant returns to scale and diminishing marginal product of each input.
- The market for widgets is perfectly competitive and ABC Inc. takes the price as given.
- The market for labor is perfectly competitive and ABC Inc. takes the wage rate as given.
- Capital is fixed in the short run and its rental rate is given.
- There are no other costs or revenues besides those mentioned in the case.

2 of 10 ●

It looks correct, although for an exam case, it would be necessary to manually check the whole thing to make sure it is viable. But that is much, much easier than drafting the case from the ground up yourself. This is a really good starting point for drafting an exam case.

But what about take-home exams? The current challenge is that for any take-home exam, Bing (or ChatGPT) can usually complete exam questions much faster than students. Even if Bing can't write entire essays (yet), it can certainly give the gist of it and students can easily expand that in interaction with the AI. So how do we structure take-home exams if we do not have options to do oral examinations or other exam formats?

Thanks. I am also developing a take-home exam in a course on international business strategy. I want to develop an exam assignment that revolves around Bartlett & Ghoshal's strategies for internationalization based on their 1989 paper. Search for best practice for designing essay questions in a way that makes it difficult to answer using AI tools, such as ChatGPT and Bing. Then search for best practice in how to make meaningful exam assignments in business strategy courses. Then use those searches to make a draft exam assignment (max 600 words) that contains five open-ended questions related to Bartlett & Ghoshal's ideas.

Here is a draft exam assignment based on your request:

Assignment: Bartlett & Ghoshal's Strategies for Internationalization

In this assignment, you will apply the concepts and frameworks from Bartlett & Ghoshal's 1989 paper "Managing Across Borders: The Transnational Solution" to analyze the internationalization strategies of two companies of your choice. You will compare and contrast their approaches and evaluate their strengths and weaknesses.

You will write an essay of no more than 3000 words, answering the following questions:

1. Briefly summarize the main arguments and contributions of Bartlett & Ghoshal's paper. What are the three strategic imperatives for multinational corporations (MNCs)? What are the four types of MNCs that they propose? How do they differ in terms of organizational structure, culture, processes, and capabilities? [1](#)
2. Choose two companies that operate in different industries and have different internationalization strategies. Provide some background information on each company, such as their history, mission, vision, products/services, markets, competitors, etc. [2](#)
3. Based on Bartlett & Ghoshal's typology, classify each company as a global, multinational, international, or transnational MNC. Explain your reasoning and provide evidence from their websites, annual reports, press releases, or other sources. [1](#) [2](#)
4. Analyze how each company manages the three strategic imperatives of global efficiency, local responsiveness, and worldwide learning. How do they balance the trade-offs between standardization and adaptation? How do they leverage their resources and capabilities across borders? How do they foster innovation and knowledge transfer within their organization? [1](#) [3](#) [4](#)
5. Evaluate the strengths and weaknesses of each company's internationalization strategy. How well do they align with their industry characteristics and competitive environment? What are some potential challenges or risks that they face? How could they improve their performance or sustainability in the future? [1](#) [3](#)

Really strong response by Bing. Bartlett & Ghoshal's framework is an easy case for Bing, because it is so widely used that it is referenced on many sites across the Internet. That means that even if Harvard and the publishing industry hides the papers from the public as best they can, Bing can still infer the important content from the article. Thanks for democratising science, Bing!

However, Bing is not done answering:

To make this assignment meaningful and effective,

- Do provide detail in your essay description. Explain what you expect from students in terms of content (e.g., concepts/frameworks to use), structure (e.g., introduction/body/conclusion), format (e.g., word limit/references), and criteria (e.g., analysis/evaluation/critical thinking).²²
- Do design questions that require students to apply higher-order thinking skills rather than recall factual information. Use verbs such as analyze/evaluate/compare/contrast/synthesize rather than describe/summarize/list/explain.²³
- Do ask students to use specific examples or evidence from real-world cases to support their arguments. This will make the assignment more relevant and authentic.³⁴
- Do not make questions too broad or vague that could allow students to use AI tools such as ChatGPT or Bing to generate generic answers. Instead, make questions more focused or specific that require students to demonstrate their understanding of the course material.²³
- Do not make questions too easy or difficult that could discourage students from engaging with the assignment. Instead, make questions challenging but achievable that stimulate students' interest and curiosity.²³

Learn more: [1. writingproject.fas.harvard.edu](#) [2. depts.ttu.edu](#) [3. hbr.org](#) [+3 more](#) 3 of 10

In this part of the answer, it is clear that Bing is drawing on the search term where I specified it should find a way to formulate exam questions that makes it difficult for AI to answer. I'm not sure Bing solves that sufficiently here. However, I have a trick up my sleeve:

Add a question to the case that asks the student to reflect on what learning about management theory and business strategy has meant for them. The question should prompt the student to share personal reflections and ideas about how the course and its content has changed (or not changed) their outlook, their ideas about their career, or creativity in a business context.

Here is a possible question to add to the case:

6. Reflect on what learning about management theory and business strategy has meant for you. How has this course and its content changed (or not changed) your outlook, your ideas about your career, or your creativity in a business context? Provide some specific examples of how you have applied or plan to apply what you have learned in this course to your personal or professional goals.

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Not too creative, but okay. Then I ask Bing to answer it:

Thank you. Provide an example of how an undergrad student might answer that question.

Here is a possible example of how an undergrad student might answer that question:

Learning about management theory and business strategy has been a valuable and eye-opening experience for me. This course and its content have changed my outlook on how businesses operate in a complex and dynamic world. I have learned that there is no one best way to manage or strategize, but rather different approaches that suit different contexts and goals. I have also learned that managing and strategizing are not only about rational analysis and decision making, but also about creativity, innovation, and collaboration.

One of the most influential concepts that I learned in this course was Bartlett & Ghoshal's typology of MNCs. This concept helped me understand the different ways that companies can expand and compete internationally, and the trade-offs and challenges that they face. I found it fascinating to compare and contrast different companies' strategies based on this typology, such as Apple vs Samsung or Starbucks vs McDonald's. This concept also inspired me to think about my own career aspirations and how I can leverage my skills and knowledge in a global market.

Another concept that I learned in this course that sparked my creativity was design-led strategy. This concept taught me how to use design thinking methods to solve problems and generate ideas in a business context. I enjoyed applying these methods to various case studies and scenarios, such as creating a new product or service for a target market or improving an existing process or system. This concept also encouraged me to be more empathetic, curious, and experimental in my approach to learning and working.

Overall, this course has been a rewarding and enriching journey for me. It has broadened my perspective on management theory and business strategy, as well as enhanced my analytical, creative, and interpersonal skills. I feel more confident and prepared to pursue my personal or professional goals in the future.

5 of 10 ●

As you can tell, this is quite formulaic and not a very good response. Not failing, but also not excellent. The trick here is that Bing is very good at separating feelings and reflections from precision and content, because that is what it is supposed to be good at. So while you are by no means making an exam "AI-proof" by changing questions towards this, you are making it more difficult to easily trick the system. We can test Bing even further on this:

Pretend to be an undergrad student and answer the following exam question: "What personal reflections have meant the most to you when looking back at the course? Be specific about events or moments of learning throughout the course and provide explicit examples."

Here is a possible answer to the exam question:

When looking back at the course, the personal reflections that have meant the most to me are the ones that have connected my learning to my experiences and aspirations. For example, one of the reflections that I did was about how I can apply Bartlett & Ghoshal's typology of MNCs to my own career goals. This reflection made me think about what kind of company I would like to work for or create in the future, and what kind of skills and competencies I would need to succeed in a global environment. Another reflection that I did was about how I can use design-led strategy to solve a real-world problem that I care about. This reflection allowed me to use my creativity and empathy to come up with a novel and feasible solution for reducing food waste in my community. These reflections have been meaningful to me because they have not only deepened my understanding of the course concepts and frameworks, but also enabled me to apply them to my personal or professional interests.

7 of 10

Here, Bing is even worse. These events and moments are not at all *specific* events and moments because Bing can't refer to events or moments that did not happen - at least in this instance. If we explain to students that we want them to integrate *specific events or situations where they realised or learned something* as part of the actual course, then they can't use Bing to easily do that. They can still turn to ChatGPT to make something entirely up, but odds are that the effort needed to make ChatGPT make up something that actually resembles real events is so huge that it is simply not worth it for a student. I encourage all teachers to play around with this to find the limitations of the AI systems on this.

There are other ways to use Bing to generate exam questions. Let's design a multiple choice exam!

I want to make a multiple choice exam on the topic. There should be 6 questions on Bartlett & Ghoshal's framework. Please make 6 draft questions with an appropriate number of options for this.

Here are some possible draft questions with an appropriate number of options for this topic:

1. According to Bartlett & Ghoshal's framework, what are the two criteria that determine how businesses operate internationally? a) Global integration and local responsiveness b) Global standardization and local adaptation c) Global coordination and local differentiation d) Global efficiency and local effectiveness **Answer: a**
2. According to Bartlett & Ghoshal's framework, what type of business has a high degree of global integration and a low degree of local responsiveness? a) International business b) Multi-domestic business c) Transnational business d) Global business **Answer: d**
3. According to Bartlett & Ghoshal's framework, what type of business has a low degree of global integration and a high degree of local responsiveness? a) International business b) Multi-domestic business c) Transnational business d) Global business **Answer: b**
4. According to Bartlett & Ghoshal's framework, what type of business has a high degree of both global integration and local responsiveness? a) International business b) Multi-domestic business c) Transnational business d) Global business **Answer: c**
5. According to Bartlett & Ghoshal's framework, what type of business has a low degree of both global integration and local responsiveness? a) International business b) Multi-domestic business c) Transnational business d) Global business **Answer: a**
6. According to Bartlett & Ghoshal's framework, what are some examples of global businesses that aim to reduce costs by standardizing their products worldwide? a) Apple and Samsung b) Starbucks and McDonald's c) Coca-Cola and Intel d) IKEA and Toyota **Answer: c or d**

Learn more: [1. business-to-you.com](https://www.business-to-you.com) [2. aqa.org.uk](https://www.aqa.org.uk) [3. thetutoracademy.com](https://www.thetutoracademy.com)

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And let's change the formatting:

Now set it up in a table to resemble how it might look in an actual multiple-choice test

Here is how it might look in an actual multiple-choice test:

Question	Option A	Option B	Option C	Option D
1) According to Bartlett & Ghoshal's framework, what are the two criteria that determine how businesses operate internationally?	Global integration and local responsiveness	Global standardization and local adaptation	Global coordination and local differentiation	Global efficiency and local effectiveness
2) According to Bartlett & Ghoshal's framework, what type of business has a high degree of global integration and a low degree of local responsiveness?	International business	Multi-domestic business	Transnational business	Global business

The rest is cut off for brevity, you get the picture.

Making grading rubrics with Bing

Closely related with exam design is grading rubrics. In case you are unfamiliar with the term:

A grading rubric is a set of criteria for evaluating students' work [1](#) [2](#). It helps teachers provide consistent feedback and grades [2](#) [3](#). A rubric usually has different levels of performance and quality definitions for each criterion [1](#) [4](#). For example, a rubric for an essay might have criteria like "thesis statement", "organization", "grammar", etc., and levels like "excellent", "good", "fair", etc.

Are you looking for a specific type of rubric or an example?

Learn more: [1. en.wikipedia.org](https://en.wikipedia.org) [2. en.wikipedia.org](https://en.wikipedia.org) [+2 more](#)

1 of 10

Can you make a draft rubric? I want to use it to evaluate my student's projects in our qualitative methods course. The categories are: Research question, research design, data collection, analytical strategy, evaluative criteria, reflexivity.

Here, Bing decided to act out and bug on formatting several times (something that happens from time to time), but here is the working version:

Okay, I will redo the last action by setting it up in a table instead and making sure formatting works. I will also make it short and precise by excluding less important details/sentences. Here is the revised rubric for a qualitative methods project:

Category	Excellent	Good	Fair	Poor
Research question	Clear, focused, relevant, original. Addresses a significant gap.	Clear, focused, relevant. Addresses an existing gap.	Somewhat clear and focused. Relates to an existing gap.	Unclear, unfocused, irrelevant or trivial. Does not address any gap.
Research design	Appropriate, coherent and justified. Ethical and respectful of diversity. Creative and innovative.	Suitable and explained. Ethical and respectful of diversity. Some creativity and innovation.	Acceptable but not well explained. Some ethical principles and respect for diversity. Lacks creativity and innovation.	Inappropriate, inconsistent or unjustified. Violates ethics or ignores diversity. No creativity or innovation.

Of course, I could specify that we are working with specific textbooks or certain papers as the basis for evaluation, and then iterate on it. I will leave that to the reader.

Structuring and planning teaching

To some extent, ChatGPT structure and plan courses as well, but I have found that the search element of Bing means that whenever necessary, I can ask Bing to integrate a

certain search term into its output even for structuring and planning tasks. So let us design an entire course from scratch using only Bing.

For our fictional course, we are going to plan a master level course on advanced international political economy. The more advanced the topic, the more niche it is, and the more difficulty Bing will have in finding relevant material. For example, Porter's five forces is incredibly basic so it is very easy to find, but with advanced IPE, I'm not sure Bing can find a lot of stuff on transnational professional dynamics or global value chains. So this will present somewhat of a challenge for Bing.

First, let's start by making a course document for approval by the study board. We will take departure in the standard CBS template which should be easy to find.

I want to design a course in advanced international political economy. It should be taught at Copenhagen Business School at the first semester from early september to early december, with an exam in early january. I need your help designing the course in small chunks at a time. First task is to design a basic course document. Search for the CBS course catalogue and find the standard way that course documents are structured. Then search for other institutions' courses on IPE or advanced IPE. Then combine those searches into a draft course document that looks like any other standard CBS course document.

A fairly advanced prompt, but the trick here is to utilise the standard *Search X, Search Y, then combine* and have Bing understand how courses are set up at CBS, and then combine that with inspiration from other institutions' courses on IPE. The following snippets you are about to read are excerpts from *one singular output* made by Bing based on the above prompt.

Hello, this is Bing. I'm happy to help you design a course in advanced international political economy.😊

According to the CBS course catalogue ¹, a standard course document should include the following sections:

- Course title
- Course code
- ECTS credits
- Level
- Semester
- Language of instruction
- Course coordinator
- Prerequisites
- Learning objectives
- Content
- Teaching methods
- Exam form

To find examples of other institutions' courses on IPE or advanced IPE, I searched for "international political economy syllabus" and found these results:

International Political Economy (IPE) - University of California, Berkeley

International Political Economy - London School of Economics and Political Science

Advanced International Political Economy - University of Warwick

Okay, that's very useful. Also looks a lot like the standard CBS documents that I know and love. Bing continues:

Based on these examples, I drafted a course document that looks like this:

Course title: Advanced International Political Economy

Course code: AIPExxx

ECTS credits: 7.5

Level: Master's level

Semester: Autumn 2023 (September 1 - December 15)

Language of instruction: English

Course coordinator: TBD

Prerequisites: Basic knowledge of international relations and economics.

Learning objectives:

By the end of this course, students should be able to:

- Explain and critically evaluate the main theories and concepts of international political economy (IPE).
- Analyze and compare the historical development and contemporary dynamics of different aspects of IPE, such as trade, finance, development, globalization, regionalism and governance.
- Apply different theoretical perspectives and empirical methods to conduct independent research on a relevant topic in IPE.
- Communicate effectively their arguments and findings in oral presentations and written assignments.

This is really good. Note that Bing integrated the relatively vague specifications I had and added the necessary fluff to make it viable, like exact dates (fits with CBS standard dates) and learning objectives (I did not mention those specifically yet they are crucial at CBS). But Bing is not done:

Content:

This course provides an advanced introduction to the study of international political economy (IPE), which examines how political and economic factors interact at the global level. The course covers both classical and contemporary debates in IPE, as well as various thematic issues such as trade, finance, development, globalization, regionalism and governance. The course also introduces students to different methodological approaches and research designs in IPE.

The course is divided into three parts:

Part 1: Theories and Concepts of IPE

This part introduces students to the main theoretical perspectives and analytical frameworks in IPE, such as realism, liberalism, constructivism, Marxism, feminism, and institutionalism.

Part 2: Historical Development and Contemporary Dynamics of IPE

This part examines how different aspects of IPE have evolved over time and how they shape current global challenges. Topics include trade, finance, development, globalization, regionalism, and governance.

Part 3: Research Methods and Design in IPE

This part introduces students to different methodological approaches and research designs in IPE. Topics include qualitative methods, quantitative methods, mixed methods, case studies, and comparative analysis.

Teaching methods:

The course consists of lectures (2 hours per week) and seminars (2 hours per week). Lectures provide an overview of the main topics and readings for each week. Seminars involve student-led discussions based on assigned readings or group presentations based on individual research projects.

Students are expected to:

- Attend all lectures and seminars.
- Complete all assigned readings before each class.
- Actively participate in class discussions.
- Prepare a group presentation based on an individual research project.
- Submit a written assignment based on an individual research project.

This looks a lot like the classes I had when I was a master student. Maybe we can switch out research methods and add something else, but as a starting point, this is pretty good. And yet, Bing continues:

Exam form:

The exam consists of two parts:

Part A: Group presentation (30%) Students will work in groups of 3 or 4 to conduct an individual research project on a relevant topic in IPE. Each group will present their project orally during one seminar session towards the end of the semester. The presentation should last about 15 minutes per group member plus 10 minutes for questions from other students or instructors. The presentation should include:

- A clear research question that relates to one or more themes covered by the course.
- A review of relevant literature that situates your project within existing debates in IPE.
-

A justification for your chosen theoretical perspective(s) and methodological approach(es).

An explanation of your data collection and analysis techniques.

A summary of your main findings and implications.

Part B: Written assignment (70%) Students will submit a written assignment based on their individual research project by January 10th ,2024 . The assignment should be about 4000 words long excluding references . The assignment should follow the same structure as the presentation , but with more details , evidence ,

Learn more: [1. kursuskatalog.cbs.dk](#) [2. cbs.dk](#) [3. kursuskatalog.cbs.dk](#) 1 of 10 ●

You can see Bing bugging out on the formatting again, but the content itself is great. Good starting point for working. As you can tell, Bing was not done. In such an instance, you can tell Bing to simply “continue” and it will!

An explanation of your data collection and analysis techniques.

A summary of your main findings and implications.

Part B: Written assignment (70%) Students will submit a written assignment based on their individual research project by January 10th ,2024 . The assignment should be about 4000 words long excluding references . The assignment should follow the same structure as the presentation , but with more details , evidence ,

Learn more: [1. kursuskatalog.cbs.dk](#) [2. cbs.dk](#) [3. kursuskatalog.cbs.dk](#) 1 of 10 ●

Continue

and arguments. The assignment should also include:

- A title page with your name, student number, course code and title, and word count.
- A table of contents with page numbers.
- An introduction that introduces your research question, main argument, and outline of the paper.
- A literature review that summarizes and critically evaluates the relevant literature on your topic.
- A theory section that explains and justifies your chosen theoretical perspective(s) and how they inform your analysis.

We can live with this little break. It's important to note that CBS sometimes have extremely specific guidelines for exams on the course pages, so Bing is being extra careful here and adding many requirements for the exam.

- A methods section that describes and justifies your chosen methodological approach(es) and how you collected and analyzed your data.
- A findings section that presents and discusses your main findings in relation to your research question and theoretical framework.
- A conclusion that summarizes your main argument, answers your research question, discusses the implications of your findings for IPE theory and practice, and suggests possible avenues for future research.
- A reference list that follows a consistent citation style (e.g., APA or Harvard).
- An appendix (if applicable) that contains any additional information or data that supports your analysis.

The written assignment will be assessed based on the following criteria:

- Relevance: The extent to which the assignment addresses a relevant topic in IPE and relates it to one or more themes covered by the course.
- Argumentation: The extent to which the assignment develops a clear, coherent, and original argument that answers the research question and is supported by appropriate evidence and analysis.
- Literature: The extent to which the assignment demonstrates a comprehensive and critical understanding of the relevant literature on the topic and situates the project within existing debates in IPE.
- Theory: The extent to which the assignment explains and justifies the chosen theoretical perspective(s) and how they inform the analysis.
-

Methods: The extent to which the assignment describes and justifies the chosen methodological approach(es) and how they are applied to collect and analyze the data.

Findings: The extent to which the assignment presents and discusses the main findings in relation to the research question and theoretical framework.

Conclusion: The extent to which the assignment summarizes the main argument, answers the research question, discusses the implications of the findings for IPE theory and practice, and suggests possible avenues for future research.

•

Presentation: The extent to which the assignment follows a clear structure, uses correct grammar, spelling, punctuation, citation style, and word count.

This is my draft course document based on my web searches. I hope it helps you design a course in advanced international political economy.😊

Do you have any questions or feedback for me?🤔

And then we are finally done with the output! So to recap, in a single prompt with a bit of sophisticated logic, Bing produced an entire course document appropriate for CBS, with

relevant (yet not perfect) content for a course in advanced IPE. This is quite impressive. We could probably have done with less, but this goes to show how much automatic organising Bing can help with.

However, this is just the start. We need to plan some lectures! Because of the bugging out I had to open a new chat, which meant I had to tell Bing what I wanted in detail once more.

I want to structure a line of lectures in a master level course on advanced international political economy. The lectures are divided in three parts: Part A is about contemporary theories and concepts in IPE, with a focus on marginalized voices. Part B is about global professional networks and authority dynamics. Part C is about power in global value chains. The course will run from September to early December, and I want 8 lectures, with the first lecture being introduction and course overview. Search for best practice when designing lecture and teaching plans in university. Then search for relevant IPE literature on the three themes. Then use those searches to make a tentative table of lectures. Keep it simple, I only want titles of lectures and dates - we will fill out content later.

Hello, this is Bing. I can help you with your request. 😊

According to some web sources [1](#) [2](#) [3](#), some best practices for designing lecture and teaching plans in university are:

- Provide a conceptual framework for the information
- Assist students in clarifying key concepts
- Highlight similarities and differences among concepts
- Share personal insights, experience and anecdotes
- Use audiovisual aids to enhance your presentation
- Structure your session with clear objectives, introduction, body and conclusion
- Estimate the duration of each segment of teaching
- Prepare materials and resources needed for the session

Do you want me to continue with searching for relevant IPE literature on the three themes?

Learn more: [1. poorvucenter.yale.edu](#) [2. ctl.utexas.edu](#) [3. insead.edu](#)

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All right, that's very helpful. Please continue, Bing.

Yes. Make three separate searches on the relevant IPE themes. Then make an additional search on Rasmus Corlin Christensen and his research. Then use those searches to draft a simple lecture plan in a table

Rasmus has done some really cool work on professional dynamics in international tax politics, so I want his work to be featured on the course.

OK. I have searched for relevant IPE literature on the first theme: contemporary theories and concepts in IPE marginalized voices. Here are some web sources that you may find useful:

- Blind spots in IPE: marginalized perspectives and neglected trends in contemporary capitalism
- Enabling the Voices of Marginalized Groups of People in Theoretical Development
- Blind spots in IPE : marginalized perspectives and neglected trends in contemporary capitalism

Do you want me to continue with searching for relevant IPE literature on the second theme: global professional networks and authority dynamics?

Learn more:

1. tandfonline.com

2. link.springer.com

3. eprints.whiterose.ac.uk

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Apparently, Bing thinks those two items are different because in one uploaded version, there is an extra space between the “IPE” and “:”. At this point I just want the lecture plan:

No, just make a draft table with lectures please

OK. I have made a draft table with lectures based on your request. Please note that this is only a tentative plan and you may need to adjust it according to your needs and preferences.

Date	Lecture Title
September 1	Introduction and course overview
September 8	Contemporary theories and concepts in IPE marginalized voices
September 15	Global professional networks and authority dynamics
September 22	Power in global value chains
September 29	Rasmus Corlin Christensen and his research
October 6	Guest lecture (TBD)
October 13	Student presentations (Part A)
October 20	Student presentations (Part B)

I hope this helps. Do you have any other questions or requests? 😊

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Great! This is useful. Except for Rasmus’ lecture. I think what happened here is that Bing missed the search on Rasmus. Let’s improve that, and improve the table in general.

Thanks. Search for Rasmus Corlin Christensen and make a suggestion for what his lecture should be about. Then search for Stefano Ponte, Leonard Seabrooke, and Duncan Wigan and provide some ideas for who should take which lectures according to their research interests. Additionally, provide some ideas for relevant IPE researchers we could invite to CBS to cover the guest lecture. Also, add numbering to the lecture table and a column with responsible teachers per lecture.

You're welcome. I have searched for Rasmus Corlin Christensen and found that he is a political economist and postdoc at Copenhagen Business School who studies the political economy of international taxation and accounting, of expertise and professionals, and the interplay between them ¹ [2](#) [3](#). A possible suggestion for his lecture could be:

- The transnational infrastructural power of professional service firms

I have also searched for Stefano Ponte, Leonard Seabrooke, and Duncan Wigan and found that they are all IPE researchers with different research interests. Here are some ideas for who should take which lectures according to their research interests:

- Stefano Ponte: Power in global value chains
- Leonard Seabrooke: Global professional networks and authority dynamics
- Duncan Wigan: Contemporary theories and concepts in IPE marginalized voices

I have also searched for relevant IPE researchers that you could invite to CBS to cover the guest lecture. Here are some names that you may consider:

- Jason Sharman: The politics of offshore finance
- Jacqueline Best: The politics of uncertainty
- Lena Rethel: The politics of Islamic finance

This is very useful! It has correctly identified Rasmus' work (he recently published on infrastructural power) and applied that to his lecture. It also found out what Stefano, Len, and Duncan wanted to teach - in fact, in one iteration of the "real" advanced IPE course that I attended myself, this was more or less exactly how their teaching was divided.

The three suggested scholars are very relevant and could all be candidates for the guest lecture. Let's look at the updated table:

I have also added numbering to the lecture table and a column with responsible teachers per lecture. Here is the updated table:

No.	Date	Lecture Title	Responsible Teacher
1	September 1	Introduction and course overview	You
2	September 8	Contemporary theories and concepts in IPE marginalized voices	Duncan Wigan
3	September 15	Global professional networks and authority dynamics	Leonard Seabrooke
4	September 22	Power in global value chains	Stefano Ponte
5	September 29	The transnational infrastructural power of professional service firms (tentative)	Rasmus Corlin Christensen
6	October 6	Guest lecture (TBD)	TBD
7	October 13	Student presentations (Part A)	You
8	October 20	Student presentations (Part B)	

Is there anything else I can do for you? 😊

Learn more: [1. phdskat.org](#) [2. cbs.dk](#) [3. cbs.dk](#)

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Cheekily, Bing has said that I should do the introduction because even if it has no idea what I do, I told it I was organising the course so of course I should do the introduction and student presentations.

Let's try to make the content for the introduction. First, we need a slide deck:

Great work Bing! I'm very happy with the output. I want your help with designing some slides for the introduction. I know you cannot make powerpoint slides, but you can probably provide some ideas for organizing a slidedeck. I have 1 hour and 40 minutes for the introduction lecture, and I want to cover the course plan, introduce the teachers, present the exam format (briefly), recap some of the prerequisites for taking the course, and then provide an overview of some of the theories and concepts they are going to learn about. Please search for best practice when designing slide decks for lectures. Then search for best practice when introducing courses in university. Use those searches to provide ideas for how to organize the slidedeck for the introductory lecture

I'm glad you're happy with the output. I have searched for best practice when designing slide decks for lectures and found some tips that you may find useful:

- Use a consistent and coherent design across all your slides ¹
- Use keywords and phrases instead of full sentences on your slides ²
- Use dual tone color overlays or other creative techniques to make your slides visually appealing ³

I have also searched for best practice when introducing courses in university and found some suggestions that you may consider:

- Introduce yourself by sharing your name, teaching and research specialties, interests, or anything else you're comfortable sharing ⁴
- Set specific expectations and have students do the same ⁴
- Teach study skills that students need to succeed in university-level courses ⁵
- Teach problem-solving and critical-thinking skills ⁵

Okay, that's useful to know. Things like this is one of the reasons Bing is superior to ChatGPT even when organising text or structuring plans, because Bing can integrate best practice searches into its output.

Based on these searches, I have some ideas for how to organize the slidedeck for the introductory lecture. You may want to divide your lecture into four parts:

- Part 1: Course overview (10 minutes)
 - Slide 1: Course title and objectives
 - Slide 2: Course plan and schedule
 - Slide 3: Exam format (briefly)
- Part 2: Teacher introductions (10 minutes)
 - Slide 4: Your introduction
 - Slide 5: Other teachers' introductions
- Part 3: Prerequisites recap (20 minutes)
 - Slide 6: Key concepts and terms from previous courses
 - Slide 7: Key readings and sources from previous courses
- Part 4: Theories and concepts overview (60 minutes)
 - Slide 8: What is IPE?
 - Slide 9: Main theories of IPE
 - Liberalism
 - Realism
 - Marxism
 - Constructivism
 - Feminism
 - Postcolonialism etc.
 - Slide(s) per theory:
 - Definition
 - Assumptions
 - Strengths
 - Weaknesses
 - Examples

I hope this helps. Do you have any other questions or requests? 😊

Learn more: [1. blog.ted.com](https://1.blog.ted.com) [2. moxieinstitute.com](https://2.moxieinstitute.com) [3. canva.com](https://3.canva.com) +3 more

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Okay, but the main theories of IPE are the undergraduate theories. This is an advanced course, so we can probably just change them out. However, I do like the slide structure per theory - that is a very useful way to structure each slide so that theoretical presentations are similar. Great job Bing!

Now we just need to populate the lectures with relevant readings. In practice, this is something the lecturers often do themselves (especially at master level teaching), so let's see if we can help Rasmus out with his lecture.

Let's use the table overview of lectures you made earlier. I want to put some tentative literature for the students to read. Let's work on the lecture by Rasmus. Search for his work, search for the overall theme, and search for literature that he cites which is widely cited elsewhere. Then use that search to suggest three research articles that are appropriate to assign to students for that specific lecture.

Based on these searches, I have some suggestions for three research articles that are appropriate to assign to students for the lecture by Rasmus Corlin Christensen. These articles are:

- Rixen, T. (2008). The political economy of international tax governance. Basingstoke: Palgrave Macmillan. This book provides a comprehensive overview of the history and development of international tax governance, as well as a theoretical and empirical analysis of its main features and challenges. ¹
- Christensen, R.C., Hearson, M., & Meinzer, M. (2019). The new politics of global tax governance: taking stock a decade after the financial crisis. *Review of International Political Economy*, 26(5), 1068-1088. This article examines how the global financial crisis of 2008-2009 triggered a wave of reforms and initiatives in global tax governance, and how these changes have affected different actors and interests. ²
- Seabrooke, L., & Wigan, D. (2017). Powering ideas through expertise: professionals in global tax battles. *Journal of European Public Policy*, 24(3), 357-374. This article explores how professionals use their expertise to shape ideas and influence policy outcomes in global tax battles, focusing on two cases: the campaign for country-by-country reporting and the OECD's Base Erosion and Profit Shifting project.

I hope this helps. Do you have any other questions or requests? 😊

Learn more: [1. link.springer.com](https://link.springer.com) [2. tandfonline.com](https://tandfonline.com) [3. cbs.dk](https://cbs.dk) [4. phdskat.org](https://phdskat.org) [+5 more](#)

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Surprisingly good. Only mistake here is that the paper in the middle in fact is authored only by Christensen and Hearson, *not* Meinzer. Otherwise, everything here is correct.

Add to this list Rasmus' recent paper on infrastructural power. Then based on those four papers in total (Rasmus' paper and the three you have already mentioned), suggest a reading guide for students. Search for best practice on how to make reading guides to inform your response.

We want Rasmus' recent paper on there as well, so I tell Bing to do it.

OK, I have added Rasmus' recent paper on infrastructural power to the list of articles. Here is the updated list:

- Rixen, T. (2008). The political economy of international tax governance. Basingstoke: Palgrave Macmillan.
- Christensen, R.C., Hearson, M., & Meinzer, M. (2019). The new politics of global tax governance: taking stock a decade after the financial crisis. *Review of International Political Economy*, 26(5), 1068-1088.
- Seabrooke, L., & Wigan, D. (2017). Powering ideas through expertise: professionals in global tax battles. *Journal of European Public Policy*, 24(3), 357-374.
- Christensen, R.C. (2022). Transnational infrastructural power of professional service firms. SocArXiv.

Based on these four papers and some best practices on how to make reading guides [1](#) [2](#) [3](#), I have also suggested a reading guide for students. Here it is:

Reading Guide for Lecture by Rasmus Corlin Christensen

Before reading:

- Think about what you already know about international taxation and how it affects different actors and interests in the global economy.
- Write down any questions or topics that you would like to learn more about regarding international taxation.

While reading:

- For each article, identify the main argument or research question, the theoretical framework or perspective used, the empirical evidence or examples provided, and the main findings or implications.
- Compare and contrast how different authors approach the topic of international taxation and how they agree or disagree with each other on key issues or debates.
- Evaluate how convincing or relevant each article is for understanding the current challenges and opportunities in global tax governance.

After reading:

- Summarize what you have learned from these articles and how they relate to the course objectives and themes.
- Reflect on how these articles have changed or confirmed your views or assumptions about international taxation and its role in international political economy.
- Formulate some questions or comments that you would like to discuss with your classmates and lecturer during the lecture.

I hope this helps. Do you have any other questions or requests? 😊

Learn more: [1. readingrockets.org](#) [2. adlit.org](#) [3. readingrockets.org](#) [4. cbs.dk](#) [+2 more](#)

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Bing found Rasmus' paper on SocArXiv (an ungated science platform) so Bing doesn't know it is already published. The rest is very good. Before asking this particular prompt, I had no idea about the best practices for making reading guides, but this seems very reasonable and if I wanted, I could dive into the cited references to check where Bing got this information from.

To wrap up, let's send out a message to our incoming students on the online learning platform of choice.

Thanks. I want to say welcome to the incoming students for the course. I need your help drafting a message I can send them on our online e-learning platform. I want to say hi in a friendly yet professional manner (they are master students after all) and bid them welcome to the course and our teaching staff. Also include information about first lecture (time and location) which I will edit myself afterwards when I know the actual time and location. Also highlight who they should contact for administrative inquiries. End the message on a nice positive note

You're welcome. I have drafted a message that you can send to the incoming students for the course. Here it is:

Hello and welcome to the course on International Political Economy: Marginalized Voices! 😊

We are very excited to have you join us for this course and we hope you will enjoy it as much as we do. This course will introduce you to some of the contemporary theories and concepts in IPE that challenge the dominant perspectives and give voice to the marginalized actors and issues in the global economy.

The teaching staff for this course consists of me (your name), Duncan Wigan, Leonard Seabrooke, Stefano Ponte, Rasmus Corlin Christensen, and a guest lecturer (TBD). We are all IPE researchers with different backgrounds and interests, and we look forward to sharing our insights and experiences with you.

The first lecture will take place on September 1 at (time) in (location). In this lecture, we will go over the course overview, introduce ourselves, present the exam format (briefly), recap some of the prerequisites for taking the course, and provide an overview of some of the theories and concepts you are going to learn about.

If you have any administrative inquiries regarding the course, such as registration, attendance, deadlines, etc., please contact (name) at (email).

We hope you are as eager as we are to start this journey together. We believe this course will offer you a valuable opportunity to broaden your horizons and deepen your understanding of IPE from different perspectives. We also hope that this course will inspire you to engage critically with the world around you and contribute positively to it.

See you soon! 🍀

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Bing forgot what the course was called, but that is easy to fix - or maybe we never agreed on a course title? Anyways, the tone is pretty good, although I would probably drop the emojis.

And there you have it. We have designed and organised an entire course. The total time I spent making this was about 1 hour and 10 minutes, which includes time spent writing about it in this document. Of course, in a real situation, more work would go into discussing with other teachers about their preferences, the specifics of the learning objectives and lectures, and the exam format. But as a starting point or even generating ideas for course structuring, this is pretty good.

Enhancing interdisciplinarity

While interdisciplinarity usually means different things in different places, all university courses differ in some ways. Even for completely standard business school programs, there will be some differences between theories and concepts taught in microeconomics, business strategy, accounting, and marketing. A problem that I have witnessed first-hand is that the more we as teachers want to integrate different perspectives in a programme or a teaching plan, the more teachers are required to understand how to bridge different types of theories across disciplines they may not understand too well. For example, if we ask our 2nd year business students to make a large group project where they have to combine theories from two different courses, the students may actually know at least one theory better than their supervisor or responsible teacher. As teachers, we are well aware that we are specialists - which is why we teach at the university level - but it can be quite difficult for teachers to engage with theoretical ideas they are not familiar with.

Bing can help a lot in this situation. For one, Bing can allow for easy conceptual and theoretical guidance as shown in the “For students” section earlier in this document. As I have tried myself in quite a few research seminars now, Bing is quite useful to look up concepts and contextualise them in a meaningful way. Yet, Bing can do more than this. You can use Bing as a teacher to juxtapose theoretical ideas and have Bing explain where they differ or align, and how they might interface.

Suppose we are supervising a group of students who want to combine organisational theory with corporate finance. Interesting idea, but how on earth would that work out? Let's ask Bing.

I am supervising a group of students who work on an interdisciplinary project. They want to combine organizational theory with corporate finance. I don't know much about either of those. Can you help me figuring out if there is an overlap of some sorts between those sets of theories?

Sure, I can help you with that. Organizational theory is the study of corporate designs and structures, and how individuals or groups interact within them to achieve goals ^{1 2}. Corporate finance is the field of finance that deals with how corporations raise and invest capital, and how they manage their financial risks ³. There may be some overlap between these two sets of theories, such as how organizational structure affects corporate financing decisions, or how corporate governance influences organizational performance. One book that covers some of these topics is **The Theory of Corporate Finance** by Jean Tirole ^{3 4}, which is a resource for graduate students and researchers of corporate finance, industrial organization, political economy, development, and macroeconomics. You may also find this article helpful: **Corporate Finance, the Theory of the Firm, and Organizations** by Patrick Bolton and David S. Scharfstein ⁵, which discusses some of the key questions and challenges in corporate finance theory.

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Jean Tirole has won the Nobel Prize, so that's probably a good starting point. Also, the Bolton and Scharfstein text exists, and that could be an interesting read here. Let's go with Bing's idea that corporate structure affects financing decisions.

Let us work on the idea of trying to understand whether organizational structure affects corporate financing decisions. What kinds of theories or concepts could be applicable here?

One possible idea is to use capital structure theory to analyze how different proportions of debt and equity affect the value and risk of a firm ¹. Capital structure theory is based on the seminal work of Modigliani and Miller (1958), who argued that under certain assumptions, such as no taxes, no bankruptcy costs, and perfect markets, the capital structure of a firm is irrelevant to its value ². However, relaxing some of these assumptions leads to different implications for optimal capital structure choices. For example, introducing taxes implies that debt financing has a tax advantage over equity financing, since interest payments are tax-deductible. Introducing bankruptcy costs implies that debt financing has a downside risk of financial distress, which reduces the value of the firm. Introducing imperfect markets implies that factors such as agency costs, asymmetric information, signaling effects, and pecking order preferences may influence how firms choose their capital structure ³. You may want to explore how these factors vary across different types of organizational structures, such as centralized vs decentralized, hierarchical vs flat, or functional vs divisional.

Learn more: [1. investopedia.com](#) [2. investopedia.com](#) [3. researchgate.net](#) [+3 more](#)

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Okay, that makes sense. I have not read Modigliani and Miller, but it sounds reasonable.

Great. Are there theories in organization studies that can help us conceptualize different organizational structures?

Yes, there are several theories in organization studies that can help you conceptualize different organizational structures. Some of them are:

- Traditional organizational theory: This theory is based on a bureaucratic-style structure, where there is one hierarchical head managing over many subordinates. This theory emphasizes formal rules, authority, division of labor, and specialization ¹.
- Open-system theory: This theory views organizations as complex systems that interact with their external environment and adapt to changing conditions. This theory emphasizes feedback loops, inputs and outputs, boundary spanning, and environmental scanning ¹.
- Systems design theory: This theory focuses on how organizations design their structures to fit their goals and strategies. This theory emphasizes contingency factors, such as size, technology, environment, and culture ¹.
- Contingency theory: This theory argues that there is no one best way to organize a firm, but rather the optimal structure depends on various situational factors that affect the firm's performance. This theory emphasizes alignment, fit, and flexibility ¹.
- Weick's model of organizing: This theory takes into account the high-stressed, fast-paced nature of today's business and reduces what is referred to as "equivocality", which is the uncertainty or ambiguity of information. This theory emphasizes sensemaking processes, communication cycles, enactment mechanisms, and loose coupling ¹.

You may want to explore how these theories can help you understand and compare different types of organizational structures.

Learn more: [1. bing.com](#) [2. indeed.com](#) [3. marketing91.com](#) [4. bizfluent.com](#) [+1 more](#)

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Okay, there's a lot of choices! Let's see if we can help our students based on this.

Let's go with contingency theory. Can you provide a few ideas for research questions that combine Modigliani and Miller with contingency theory?

Sure. Here are a few ideas for research questions that combine Modigliani and Miller with contingency theory:

- How does the optimal capital structure of a firm vary depending on its industry, size, growth rate, profitability, and market conditions?
- How do firms adjust their capital structure in response to changes in tax rates, interest rates, inflation rates, and exchange rates?
- How do firms signal their quality and value to investors and creditors through their capital structure choices?
- How do agency costs, asymmetric information, and financial distress affect the trade-off between debt and equity financing for different types of firms?
- How do organizational culture, leadership style, and decision-making process influence the capital structure decisions of firms?

You may want to review some literature on these topics to refine your research question and hypothesis.

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Some of those ideas are better than others, but I think this is a decent starting point for thinking about intersections between the two disciplines.

Another way to approach this is to find differences between concepts that may look similar. A common issue in interdisciplinary teaching is that different courses use the same words for different things. Try for yourself to define what an 'institution' is. Or what 'theory' is. 5 points for participating.

I am running a course in macroeconomics, but my students seem to be confused about how I use the word "institution". I know they have had microeconomics, organizational theory, political science, and accounting before taking my course. Could you help me understand how the concept of "institutions" may be different across those disciplines?

Hello, this is Bing. I'm happy to help you with your question. 😊

In economics, the term "institutions" can have two meanings [1](#) [2](#):

- One meaning is an organization that deals with money or with managing the distribution of money, goods, and services in an economy [3](#) [4](#). Examples of this type of institutions are banks, government agencies, and investment funds.
- Another meaning is a set of rules or norms that shape human behavior and interactions in economic activities [5](#). Examples of this type of institutions are property rights, honest government, political stability, dependable legal system, and competitive and open markets.

These two meanings are related but not identical. The first one focuses on the actors or agents that participate in economic transactions. The second one focuses on the structure or environment that influences economic outcomes.

In other disciplines, such as organizational theory, political science, and accounting, the term "institutions" may have different or broader meanings. For example:

- In organizational theory, institutions can refer to any established social pattern or practice that guides collective action.
- In political science, institutions can refer to any formal or informal arrangement that governs political behavior and decision-making.
- In accounting, institutions can refer to any entity that affects accounting practices and standards.

Therefore, it is important to clarify what you mean by "institutions" when you use it in your course. You may want to explain how your definition differs from other definitions used by your students in their previous courses.

I hope this helps you understand how the concept of "institutions" may be different across disciplines. Do you have any follow-up questions?

Learn more: [1. smartcapitalmind.com](#)

[2. econlib.org](#)

[3. dictionary.cambridge.org](#)

+2 more

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Really good answer by Bing. From here, you could go into the definitions even further, provide examples, or try to understand more advanced overlaps or intersections, such as ontological bases or whether the concepts are mainly used in causal or non-causal theorising, etc.

Identifying and implementing new modes of teaching

The intelligent reader will surmise that finding and understanding new concepts also applies to teachers wanting to find and understand new pedagogical tools, ideas, practices, or formats that fit with their teaching. In many academic contexts, spending time to improve teaching quality is usually done with the opportunity cost of spending more time researching or teaching. This is, there are quite significant incentives for teachers to conduct teaching the same way, year after year, to avoid spending too much time developing new courses or ways of teaching that detracts from research time.

However, Bing can help here. I run an evening diploma course on organisational economics where I always find it challenging to engage students who are tired after already working for 8 hours before coming to class. While there is a ton of literature on didactical practice in higher education, there is less specifically on certain situations like this, and I suppose many teaching programs or courses also have some kind of idiosyncrasy that would dictate more specific applications of best practice. So the task is twofold: Identify ways to improve teaching and figure out ways to apply it.

I am teaching a course on organizational economics at Copenhagen Business Schoo. The course runs in the evening, so students are tired and it is hard to ensure effective learning. Additionally, many of the students do not have an existing academic background, so it is more difficult for them to understand abstract logic or models. Search for evidence based research on how to engage students in this kind of situation. Also search on ways to make abstract academic concepts approachable in classroom teaching for students who may struggle with this. Then use those searches to provide me with some ideas for how to structure the classes. For reference, each class is 2,5 hours long from 17:00 - 19:30

Hello, this is Bing. I'm happy to help you with your query.😊

Based on my web searches, I found some evidence based research and some ways to make abstract academic concepts approachable for your students.

According to a study by Freeman et al. (2019)¹, students learn more when taking part in classrooms that employ active learning strategies, such as asking questions, discussing topics with peers, and solving problems. Active learning also increases student engagement and motivation². Some examples of active learning techniques are:

- Think-pair-share: Ask students to think about a question or problem individually, then pair up with a partner to discuss their ideas, and finally share their answers with the whole class.
- Peer instruction: Ask students to answer a multiple-choice question individually using clickers or smartphones, then have them explain their reasoning to a neighbor and vote again. Review the results and provide feedback.
- Case studies: Present students with a real-world scenario or problem related to the course content and have them work in groups to analyze it and propose solutions.

I will immediately note that the actual study is by [Deslauriers, McCarty, Miller and Kestin](#), not Freeman, but we can look past that as the study actually shows exactly what Bing suggests: In controlled randomised trials, students engaged in active learning learn more, but feel like they learn less. Interesting! Should probably be relevant to keep in mind when students evaluate courses. Bing continues:

To make abstract academic concepts more approachable for your students, you can use some of the following strategies [3](#) [4](#) [5](#) [6](#):

- Use concrete examples and analogies that relate to the students' prior knowledge and experience. For example, you can use everyday objects or situations to illustrate economic principles or models.
- Use visual aids such as diagrams, graphs, charts, tables, pictures, videos, etc. to help students visualize abstract concepts and see patterns and relationships.
- Use stories and narratives to engage students' emotions and imagination. For example, you can use historical anecdotes or fictional scenarios to illustrate economic concepts or theories.
- Use games and simulations to let students explore abstract concepts in a fun and interactive way. For example, you can use online platforms or apps that simulate economic situations or experiments.

Okay, not rocket science here. Concrete examples are useful for communicating abstract ideas. Let's continue:

Based on these ideas, you could structure your classes as follows:

- Start with a warm-up activity that activates the students' prior knowledge and introduces the topic of the day. For example, you can ask them to share their opinions or experiences on a relevant economic issue or problem.
- Present the main concepts or models using concrete examples, analogies, visual aids, stories, etc. that relate to the warm-up activity. For example, you can use a diagram of supply and demand curves to explain how prices are determined in a market.
- Engage the students in active learning by asking them questions, having them discuss topics with peers, solving problems together, etc. For example, you can use a think-pair-share activity to have them apply the concepts or models to different scenarios or cases.
- End with a summary and review of the main points and a preview of the next topic. For example, you can ask them to write down one thing they learned and one question they still have.

I hope this helps you plan your course on organizational economics at Copenhagen Business School. Good luck! 

Learn more: [1. news.harvard.edu](#) [2. teaching.washington.edu](#) [3. theedadvocate.org](#) [+5 more](#) 1 of 10 

Now we can use the power of iteration to let Bing help us in our specific situation:

Thanks, Bing. One of my problem with the evening classes is that some students are really tired, while other students are not. It is hard for me to differentiate teaching. Based on a three relevant searches on this challenge, can you recommend some ideas? For context, there are usually between 8 - 15 students present on any given evening.

I want to briefly include the search terms Bing used to demonstrate how Bing understood subtext in my question:

- ✓ Searching for: **how to differentiate teaching for tired students**
- ✓ Searching for: **how to deal with fatigue in evening classes**
- ✓ Searching for: **how to motivate students in evening classes**
- ✓ Generating answers for you...

Clearly, even if I don't say so directly, Bing infers that I need to motivate my students. I am unsure whether it is something that it infers from the two first searches, or whether it is part of its initial search terms. In any case:

You're welcome. I'm glad you found my previous suggestions helpful.

Based on my web searches, I found some ideas on how to differentiate teaching for tired students, how to deal with fatigue in evening classes, and how to motivate students in evening classes.

To differentiate teaching for tired students, you can use some of the following strategies [1](#) [2](#) [3](#):

- Differentiate content by providing different levels of difficulty, complexity, or depth for the same topic. For example, you can use tiered assignments that have different levels of challenge or scaffolding for different students.
- Differentiate process by providing different ways for students to engage with the content and practice their skills. For example, you can use flexible grouping that allows students to work with different peers based on their readiness, interest, or learning style.
- Differentiate product by providing different options for students to demonstrate their learning and understanding. For example, you can use choice boards that let students choose from a variety of tasks or projects that appeal to their strengths and preferences.
- Differentiate learning environment by providing different physical and emotional conditions that support student learning. For example, you can use flexible seating that allows students to choose where and how they sit in the classroom based on their comfort and needs.

If I wanted to, I could dive into any of those concepts by asking Bing to elaborate. But Bing continues:

To deal with fatigue in evening classes, you can use some of the following tips [4](#) [5](#) [6](#):

- Get enough sleep and rest before your class. Aim for at least seven hours of quality sleep per night and avoid naps during the day.
- Eat healthy and balanced meals and snacks throughout the day. Avoid skipping meals or eating too much sugar or caffeine that can cause energy crashes later.
- Stay hydrated and drink plenty of water before and during your class. Avoid alcohol or other drinks that can dehydrate you or affect your sleep quality.
- Take breaks and stretch your body and mind during your class. Move around, do some light exercises, listen to music, meditate, or do anything that helps you relax and recharge.
- Seek help if you have any medical or mental health issues that may cause or worsen your fatigue. Talk to your doctor or counselor if you have any concerns or symptoms that interfere with your daily functioning.

Not wrong, but also not helpful. I'm not the tired one Bing, I never get tired when teaching! Good luck telling my students to get enough sleep before class. Anyways:

To motivate students in evening classes, you can use some of the following strategies [7](#) [8](#) [9](#):

- Build relationships with your students and get to know their interests, goals, challenges, and needs. Show them that you care about them as individuals and learners.
- Make your classes relevant and meaningful to your students' lives and aspirations. Connect your content to real-world situations and problems that they care about or want to solve.
- Give your students autonomy and choice in their learning. Let them decide how they want to learn, what they want to learn, and how they want to show their learning.
- Provide feedback and recognition for your students' efforts and achievements. Praise them for their progress, celebrate their successes, and encourage them to keep improving.
- Challenge your students with high expectations and appropriate support. Set clear goals and criteria for success, provide scaffolding and guidance when needed, and help them overcome difficulties.

I hope these ideas help you differentiate teaching for tired students in evening classes. Good luck! 

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Point number 2 is especially relevant in organisational economics, because a very straightforward way to make the theoretical content relevant is to link it to their own work practice. So far, so good.

Great ideas. I need your help providing some ideas for how to structure a single class. Suppose I have a single class devoted to Chapter 10 of the book on organizational architecture and managerial economics by Zimmerman and Brickley. I have 2,5 hours, and I want to discuss a larger case for at least 45 minutes. Using the above answers you have given, make a few relevant searches to further gather ideas on the matter. Then provide a draft structure for one module of evening teaching from 17:00 - 19:30.

Based on my web searches, I found some ideas on how to structure a single class. Here is a draft structure for one module of evening teaching from 17:00 - 19:30 on Chapter 10 of the book on organizational architecture and managerial economics by Zimmerman and Brickley [1](#) [2](#) [3](#):

- 17:00 - 17:10: Warm-up activity. Ask students to share their experiences or opinions on organizational architecture and how it affects their work or study. Use flexible grouping to let students choose who they want to talk to.
- 17:10 - 17:40: Review of key concepts and terms from Chapter 10. Use a PowerPoint presentation or a video to summarize the main points and examples from the chapter. Ask students to take notes and write down any questions they have.
- 17:40 - 18:00: Q&A session. Invite students to ask or answer questions about the chapter. Use a randomizer app or a spinner wheel to select students or groups to participate. Provide feedback and clarification as needed.
- 18:00 - 18:15: Break. Encourage students to stretch, drink water, snack, or relax during this time. Play some music or show some funny videos to lighten the mood.
- 18:15 - 19:00: Case study discussion. Divide students into small groups based on their interest or readiness level. Assign each group a different case study related to organizational architecture from the book or other sources. Ask each group to analyze the case using the concepts and tools from Chapter 10 and prepare a brief presentation of their findings and recommendations.
- 19:00 - 19:20: Group presentations. Ask each group to present their case study analysis to the whole class using slides, posters, or other visual aids. Allow time for questions and comments from other groups and the teacher.
- 19:20 - 19:30: Wrap-up activity. Ask students to reflect on what they learned from the class and how they can apply it to their own situations. Use an exit ticket or a poll app to collect their feedback and suggestions for improvement.

I hope this draft structure helps you plan your evening class on Chapter 10. Have fun! 😊

Learn more: [1. insights.gostudent.org](#)

[2. resilienteducator.com](#)

[3. serc.carleton.edu](#)

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I will probably change this structure according to how I prefer to teach, but it is certainly some pretty decent ideas for how to organise the lecture. You can, of course, continue iterating on this with Bing and make the slidedeck for this session. In a separate chat, I confirmed that for this book, Bing can find summaries of chapters:

According to [1](#), Chapter 14 of the book on organizational architecture by Zimmerman and Brickley is about performance evaluation and compensation. It explains how managers can design and implement effective systems of measuring and rewarding employee performance that align with their organizational goals and strategies. It also discusses some of the trade-offs and challenges of using different types of performance measures and incentives.

Is there a specific aspect of this chapter that you are interested in? Do you want to know more about how to measure or reward performance, or about the pros and cons of different incentive schemes?

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[2. onlinelibrary.wiley.com](#)

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What are the key concepts or models in chapter 14?

Some of the key concepts or models in chapter 14 are:

- The principal-agent problem: This is a situation where one party (the principal) hires another party (the agent) to perform a task on their behalf, but the agent's interests may not align with the principal's. For example, a manager (the principal) may hire an employee (the agent) to work on a project, but the employee may have different preferences or incentives than the manager. This can lead to conflicts or inefficiencies if the principal cannot observe or control the agent's actions or outcomes.
- The incentive contract: This is a contract that specifies how the agent will be paid based on their performance or output. The goal of an incentive contract is to align the agent's interests with the principal's by rewarding them for achieving desired results. For example, a salesperson may receive a commission based on their sales volume or revenue, which motivates them to sell more and generate more income for themselves and the company.
- The trade-off between risk and incentives: This is a trade-off that arises when designing incentive contracts, because different types of performance measures and rewards may have different effects on the agent's risk exposure and motivation. For example, a fixed salary may reduce the agent's risk but also lower their effort level, while a variable pay based on uncertain outcomes may increase their risk but also raise their effort level. The optimal balance between risk and incentives depends on various factors, such as the agent's risk aversion, the principal's risk tolerance, and the nature of the task or environment.

Do these concepts help you understand chapter 14 better? Do you have any questions about them?

Learn more: [1. onlinelibrary.wiley.com](https://onlinelibrary.wiley.com) [2. books.google.com](https://books.google.com) [3. mheducation.com](https://mheducation.com)

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Depends, of course, on whether the book is widely available and whether there is a version of it that web crawlers can read.

Integrating AI directly into the didactical structure

As noted earlier and by many other [people online](#) (also check out the section on Useful resources), with the individualisation of AI tools like ChatGPT and Bing, we can now begin thinking of how to structure our teaching around the premise that our students will have access to Bing.

If this section begins to blow up with ideas (especially now that the ChatGPT API has been released at such a low price point), I will consider making this its own section rather than a subsection of Bing for teachers.

This is new territory, so let's... ask Bing?

I am teaching university level courses at both the bachelor's, master's, and diploma level. I want to figure out ways that I can integrate ChatGPT and Bing into my teaching. For starters, let's assume that both I and my students all have access to both ChatGPT and Bing. What are some fundamental ways this can change my approach to teaching?

That's an interesting question. Chatbots and search engines can be useful tools for enhancing education in various ways. According to some sources [1](#) [2](#) [3](#), chatbots and search engines can:

- Provide personalized feedback and guidance to students based on their learning needs and goals.
- Automate some tasks such as grading, scheduling, answering FAQs, etc.
- Increase student engagement and motivation by creating interactive and conversational learning experiences.
- Support teachers by providing data analysis, insights, and recommendations for improving their teaching methods and strategies.

What kind of courses are you teaching? Maybe I can help you find some specific examples of how chatbots and search engines can be integrated into your curriculum.

Learn more:

[1. sciencedirect.com](#)

[2. elearningindustry.com](#)

[3. thetechadvocate.org](#)

1 of 10

All right, fair enough. This is relatively generic, reflecting the relatively generic discussion going on.

I am teaching managerial economics. I want to focus on how to leverage students' access to Bing and ChatGPT. For example, I know that my students can use ChatGPT to extend simple ideas into full prose, or use Bing to create and solve personalized tests or tasks. Search for additional ways students' access to these tools, then search for research on adaptive teaching. Also search for lessons from when computers became widely available. Integrate all those searches into your answer where you provide some ideas and guidance for me as a teacher

Note that I asked Bing to search for the change in teaching when computers became standard to see if we could learn something from back then that could be applicable now.

Some ideas and guidance for you as a teacher are:

- You can use chatbots to create interactive scenarios and simulations that allow students to apply their knowledge of managerial economics to real-world problems [1](#) [2](#) [3](#). For example, you can design a chatbot that acts as a customer, a competitor, or a regulator, and have students interact with it to practice their decision-making and communication skills.
- You can use search engines to help students find relevant and reliable sources of information on various topics related to managerial economics [1](#) [3](#). For example, you can ask students to use Bing to search for data on market trends, consumer behavior, or government policies, and analyze them using economic concepts and tools.
- You can use chatbots and search engines to provide personalized feedback and guidance to students based on their learning needs and goals [1](#) [2](#) [4](#). For example, you can use a chatbot to monitor students' progress, identify their strengths and weaknesses, and suggest resources or activities that match their learning styles and preferences. You can also use a search engine to find examples of best practices or successful cases of managerial economics in different contexts and industries, and share them with students who need inspiration or motivation.
- You can use chatbots and search engines to support your adaptive teaching strategies [4](#) [5](#) [6](#). For example, you can use a chatbot to collect feedback from students on their learning experiences, challenges, and interests, and use it to adjust your planning and instruction accordingly. You can also use a search engine to keep yourself updated on the latest research and developments in managerial economics, and incorporate them into your curriculum.

Some lessons from when computers became widely available in education are:

- Computers can enhance education by providing access to information, communication, collaboration, creativity, and problem-solving opportunities [7](#) [8](#) [9](#).
- Computers can also pose challenges such as technical issues, digital divide, cyberbullying, plagiarism, distraction, and information overload [7](#) [8](#) [9](#).
- Computers require teachers to adopt new pedagogies that are learner-centered, inquiry-based, project-based, collaborative, and reflective [7](#) [8](#) [9](#).

I hope this helps you. Do you have any questions or feedback for me?

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[2. elearningindustry.com](#)

[3. acquire.io](#)

[+6 more](#)

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Some of those ideas are really good! Depending on the tool, there might be a technical barrier. The lessons from the past are not super useful, though. Let's see if we can change that:

Search for research on how technological changes and changes in what technological aids students can use changed higher education teaching, for example when pocket calculators became normal or the internet became widely accessible. Search for overviews of changes in teaching formats during those eras. Use those searches to infer some ways personalized AI tools like ChatGPT and Bing can induce similar changes in current university teaching

This is a pretty complex command. Note that I specifically ask bing to "infer" what this means, which can be tricky because sometimes, Bing will simply say that it cannot analyse anything because it is a chatbot (ignore it, Bing can *absolutely* conduct meaningful analyses).

Some ways personalized AI tools like ChatGPT and Bing can induce similar changes in current university teaching are:

- They can enable more flexible and personalized learning paths for students, who can access content, activities, and feedback at their own pace and according to their own preferences [1](#) [2](#) [3](#).
- They can foster more active and collaborative learning among students, who can interact with chatbots, peers, and instructors through various modes and platforms [1](#) [3](#) [4](#).
- They can enhance the quality and diversity of teaching methods and materials, by providing teachers with data-driven insights, recommendations, and resources that can help them design more effective and engaging learning experiences [1](#) [2](#) [4](#).
- They can challenge teachers to adopt new pedagogies that are learner-centered, inquiry-based, project-based, collaborative, and reflective [4](#) [5](#) [6](#).

These changes are similar to those that occurred when pocket calculators became normal or the internet became widely accessible in education. For example:

- Pocket calculators allowed students to perform complex calculations faster and easier, which enabled them to focus more on problem-solving and critical thinking skills [5](#).
- The internet provided students with access to a vast amount of information and resources, which increased their autonomy and responsibility for their own learning [5](#) [6](#).
- Pocket calculators and the internet required teachers to rethink their assessment methods and criteria, as well as their role as facilitators and guides rather than transmitters of knowledge [5](#) [6](#).

I hope this helps you. Do you have any questions or feedback for me?

Learn more:

[1. mckinsey.com](#)

[2. nytimes.com](#)

[3. tophat.com](#)

[4. cambridge.org](#)

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Bing came through! Impressive, I must admit. Things are shaping up. Let's return to my course on managerial economics:

Draw on those outputs to formulate two relevant search terms that will allow you to help me make my teaching in managerial economics more focused on critical thinking. Then search for the textbook on managerial economics by Scheibye and Bentzen in order to understand their pedagogical approach and the level of complexity of that book. Then use all of those searches as well as the rest of the conversation so far to provide some ideas for how to shift my managerial economics teaching towards critical thinking, creativity, and problem-solving skills without losing the core content of theories in managerial economics.

This is, perhaps, one of the most complex commands I have given Bing. You will note that I ask Bing to formulate its own search terms based on the task, find the textbook, infer its complexity and content, and then draw on those searches *and* the conversation so far to help me out. Result:

- ✓ Searching for: how to teach critical thinking in managerial economics
- ✓ Searching for: how to foster creativity and problem-solving in managerial economics
- ✓ Searching for: textbook on managerial economics by Scheibye and Bentzen
- ✓ Generating answers for you...

Some ideas for how to shift your managerial economics teaching towards critical thinking, creativity, and problem-solving skills without losing the core content of theories in managerial economics are:

- You can use ChatGPT and Bing to create interactive scenarios and simulations that allow students to apply their knowledge of managerial economics to real-world problems [1](#) [2](#) [3](#). For example, you can design a chatbot that acts as a customer, a competitor, or a regulator, and have students interact with it to practice their decision-making and communication skills. You can also use Bing to find data on market trends, consumer behavior, or government policies, and analyze them using economic concepts and tools.
- You can use ChatGPT and Bing to provide personalized feedback and guidance to students based on their learning needs and goals [1](#) [2](#) [4](#). For example, you can use a chatbot to monitor students' progress, identify their strengths and weaknesses, and suggest resources or activities that match their learning styles and preferences. You can also use Bing to find examples of best practices or successful cases of managerial economics in different contexts and industries, and share them with students who need inspiration or motivation.
- You can use ChatGPT and Bing to support your adaptive teaching strategies [4](#) [5](#) [6](#). For example, you can use a chatbot to collect feedback from students on their learning experiences, challenges, and interests, and use it to adjust your planning and instruction accordingly. You can also use Bing to keep yourself updated on the latest research and developments in managerial economics, and incorporate them into your curriculum.
- You can use the textbook on managerial economics by Scheibye and Bentzen as a reference for your course content and structure [7](#) [8](#) [9](#). The textbook covers the main topics of managerial economics such as demand analysis, production analysis, cost analysis, market structure analysis, pricing strategies, game theory, risk analysis, capital budgeting, etc. The textbook also provides examples, exercises, cases, appendices, glossaries, etc. that can help you design your course materials and activities.

I hope this helps you. Do you have any questions or feedback for me?

Learn more: [1. economicseducation.org](#) [2. jstor.org](#) [3. aeaweb.org](#) [+6 more](#)

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Okay, interesting stuff. Clearly, Bing has leaned on its earlier response to formulate some ideas. I will also note that Bing suggested this response for me after this output:



Yes. How do I design a chatbot for my course?

No. Thank you for your help.

Of course Bing can help me design a chatbot for my course! I'll leave that for now, as it can get a little technical - and also because I fully expect someone is already now probably making an app or a program that can do this for any given university course. Let's go in another direction:

Let's return to managerial economics. Provided that my students use Bing, what are some tasks, cases, or worksheets I can give them that allows them to utilize the power of Bing while also training their creativity or critical thinking in the context of managerial economics?

This is a fairly challenging problem that I have struggled with professionally for some years.

Some examples of tasks, cases, or worksheets that you can give your students that allow them to utilize the power of Bing while also training their creativity or critical thinking in the context of managerial economics are:

- You can give them a case study that involves a real-world business problem or decision that requires them to apply their knowledge of managerial economics concepts and tools ¹ ². For example, you can ask them to analyze the market structure, demand and supply factors, pricing strategies, production costs, etc. of a specific industry or firm. You can also ask them to evaluate the impact of external factors, such as government policies, social trends, technological changes, etc. on the business situation. You can use Bing to find relevant data, information, and examples that can help them with their analysis and recommendations.
- You can give them a task that involves solving a puzzle or a challenge that requires them to use their creativity and problem-solving skills ³. For example, you can ask them to design a new product or service that meets the needs and preferences of a target market segment. You can also ask them to devise a marketing plan or a business model that maximizes their profits and minimizes their risks. You can use Bing to find inspiration, ideas, and feedback that can help them with their design and implementation.
- You can give them a worksheet that involves answering multiple-choice or short-answer questions that test their understanding and application of managerial economics theories and principles ². For example, you can ask them to identify the optimal output level, price level, profit level, etc. for a given firm or industry. You can also ask them to compare and contrast different market structures, pricing methods, cost functions, etc. You can use Bing to find additional resources or explanations that can help them with their answers and revisions.

I hope this helps you. Do you have any questions or feedback for me?

Learn more: 1. economicsnetwork.ac.uk 2. assignmenttask.com 3. studocu.com

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Here we see the limits of Bing. Because there is not a lot of available text or research on designing this, Bing cannot develop something for us. I can verify that the creative version of Bing also did not add a lot of interesting insights:

Some tasks, cases, or worksheets that you can give your students are:

- Analyze a real-world business case using managerial economics concepts and tools. For example, you can ask them to study how Netflix uses data analytics to optimize its pricing strategy and content production.
- Conduct a market research project using Bing to collect and analyze data on consumer preferences, market trends, competitors' strategies, etc. For example, you can ask them to design a survey questionnaire and use Bing Forms to collect responses from potential customers for a new product idea.
- Create a business plan for a hypothetical or existing firm using managerial economics principles and techniques. For example, you can ask them to identify the target market, estimate the demand and supply curves, calculate the break-even point and profit margin, etc.
- Solve numerical problems or exercises using mathematical formulas and models related to managerial economics topics. For example, you can ask them to calculate the elasticity of demand or supply for a given product or service.
- Write an essay or a report on a current issue or topic related to managerial economics. For example, you can ask them to discuss the pros and cons of different types of market structures (such as perfect competition, monopoly, oligopoly) or the role of government intervention in markets (such as antitrust laws).

I hope these suggestions are helpful for you. If you need more information or assistance on any of these tasks or topics, please feel free to ask me more questions. 😊

Learn more:

1. wallstreetmojo.com

2. en.wikipedia.org

3. analyticssteps.com

+3 more

1 of 10 ●

I anticipate that this section will grow once teachers start experimenting themselves with Bing and then share their ideas online.

Search for experiences from teachers who have been teaching students that are using ChatGPT or Bing. Use that search to provide some indications for things that work, things that don't work, and things I should consider doing.

I will probably run this search term regularly.

Some indications for things that work, things that don't work, and things you should consider doing when teaching students that are using ChatGPT or Bing are:

- Things that work: Using ChatGPT or Bing as a tool to enhance creativity, critical thinking, and problem-solving skills. For example, you can use ChatGPT to generate prompts, questions, scenarios, or feedback for your students ^{1 2}. You can also use Bing to find relevant data, information, and examples that can help your students with their analysis and recommendations ³.
- Things that don't work: Relying on ChatGPT or Bing as a substitute for learning, teaching, or assessment. For example, you should not use ChatGPT to write essays, reports, or tests for your students ^{1 3}. You should also not use Bing to copy and paste answers or sources without proper citation or evaluation ³.
- Things you should consider doing: Providing clear guidance and expectations for your students on how to use ChatGPT or Bing appropriately and ethically. For example, you should explain the benefits and limitations of ChatGPT or Bing as an AI tool ^{1 2}. You should also establish rules and consequences for misuse or abuse of ChatGPT or Bing in your classroom ³.

I hope this helps you. Do you have any questions or feedback for me?

Learn more: [1. usatoday.com](https://www.usatoday.com) [2. zdnet.com](https://www.zdnet.com) [3. edweek.org](https://www.edweek.org)

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This output was generated in early March, 2023. Maybe it will look different in a few months' time. This is relevant, but also generic and cautious because Bing covers the generic types of articles that have been written the last few months. Now on to something else.

Supervision with ChatGPT and Bing

In the section for students, I alluded to using ChatGPT and Bing to provide draft material that can be used for further discussion with your supervisor. But how can supervisors themselves use AI tools productively? Obviously, there are many standard use cases that are common, like having Bing explain something to you that you are unfamiliar with, but that your students are using. But are there also additional use cases?

In my (so far limited) experience, the foundation of a good AI collaboration in supervision is to establish a social contract between students and supervisor to create an open and safe space to discuss ethical AI usage. On one hand, the supervisor should expect that the students don't cheat with AI, and conversely, students can expect that they can discuss AI openly and non-judgmentally with their supervisor. So in a sense, the best way to use AI as a supervisor is to understand AI well enough to assist students in their usage.

However, let's figure out how to make AI a productive co-pilot in the supervision process. For starters, we can catch up on some approaches to supervision:

I am supervising a master's thesis at Copenhagen Business School. They are writing about a case company, Anonymous Consultancy 1, and their research question is, "how can Consultancy 1 adapt their business model to emerging AI capabilities?". I want to figure out how I can give them the best possible guidance with the least amount of effort. What are some current perspectives on supervision that I should know about?

Here, I have just made up a project and indicated to Bing that I want to be useful but not spend a lot of effort.

Hello, this is Bing. I'm glad you are interested in supervision of master's thesis. 😊

Some current perspectives on supervision that you should know about are:

- Supervision is a **compulsory** and **asymmetric** relationship between the supervisor and the student, where the supervisor has more authority and responsibility ^{1 2}.
- Supervision can follow different **models**, such as the teaching model, the apprenticeship model, the counselling model or the contractual model, depending on the level of guidance and autonomy expected from the student and the supervisor ³.
- Supervision involves various **roles** and **responsibilities**, such as selecting a suitable topic, providing feedback, supporting the student's learning process, ensuring academic quality and ethical standards, and nominating an outside reader for evaluation ^{4 5}.
- Supervision can be influenced by various **factors**, such as the student's background, motivation, skills and expectations, the supervisor's expertise, style and availability, the institutional culture and regulations, and the external environment and stakeholders ³.
- Supervision can be improved by **reflection** on one's own supervisory practices, sharing experiences with other supervisors, attending training courses or workshops, and seeking feedback from students and colleagues ^{3 2}.

I hope this helps you to give your students the best possible guidance with the least amount of effort. 🌟

Learn more: [1. uv.uio.no](#) [2. tandfonline.com](#) [3. researchgate.net](#) [+2 more](#)

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This is Denmark, so the following applies:

I supervise in Danish context where we expect master students to be maximum independent, have a high degree of critical thinking and reflection, be analytically capable without hands-on supervision.
What supervision style would you recommend?

Based on your description of the Danish context, I would recommend a **contractual** or **counselling** style of supervision for your master students. These styles are characterized by:

- A high degree of **autonomy** and **independence** for the student, who is expected to take responsibility for their own learning and research process ¹.
- A clear and explicit **agreement** between the supervisor and the student on the goals, expectations, roles and responsibilities of each party, as well as the frequency and format of meetings and feedback ^{2 3}.
- A **supportive** and **facilitative role** for the supervisor, who acts as a mentor, coach, consultant or adviser, rather than a teacher or manager ^{1 3}.
- A focus on **critical thinking**, **reflection** and **analysis**, rather than on specific methods or techniques ^{1 3}.

These styles of supervision can help your students develop their own research skills and competencies, while also providing them with guidance and feedback when needed. However, they also require a high level of **motivation**, **initiative** and **self-regulation** from the student, as well as trust, respect and communication from both parties ^{1 3}.

I hope this helps you to find a suitable supervision style for your students. 😊

Learn more: [1. ucl.ac.uk](#) [2. mcgill.ca](#) [3. researchgate.net](#)

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Cool, thanks Bing. Now, I need some help on how to provide usable feedback to my students.

Thanks, Bing. Given this approach, I want your help with how to give usable feedback to my students. They have handed in a draft methodology section, and I find that they lack some reflection on their own biases (they both work for Consultancy 1), they lack a clear analytical strategy, and their coding is not very clear. How can I give them feedback on this while also ensuring that I push them towards more critical thinking and reflection without sacrificing their independence?

You're welcome. Giving feedback to your students is an important part of supervision, as it can help them improve their academic writing skills, raise their awareness of the thesis genre, and become more reflective and critical writers ^{1 2}. However, giving feedback also requires some skills and strategies to make it effective and usable for your students. Here are some tips on how to give feedback on your students' draft methodology section:

- Start with some positive comments on what they have done well, such as their research design, data collection methods, or ethical considerations. This can help them feel motivated and confident, and also show them what they should keep doing ³.
- Identify the main areas that need improvement, such as their reflection on their own biases, their analytical strategy, or their coding. Explain why these are important for their research quality and validity, and provide some examples or suggestions on how to address them ³.
- Use clear and specific language to communicate your feedback, avoiding vague or ambiguous terms that may confuse or discourage your students. For example, instead of saying "your coding is not very clear", you could say "your coding categories are too broad and overlapping, which makes it hard to see the patterns and themes in your data. You could try to refine your categories by using more descriptive labels and subcategories" ³.
- Balance your feedback between praise and criticism, and between global and local issues. Don't overwhelm your students with too many negative comments or too many minor details that may distract them from the main points. Focus on the most important aspects that affect their research quality and coherence, and prioritize them according to their urgency and difficulty ³.
- Encourage your students to think critically and reflectively about their own work, rather than just following your suggestions blindly. Ask them questions that prompt them to explain their choices, justify their claims, or consider alternative perspectives or methods. For example, you could ask "how did you account for your own positionality and potential biases as researchers working for Consultancy 1? How did this affect your data collection and analysis?" or "what are the strengths and limitations of your analytical strategy? How does it align with your research question and theoretical framework?" ^{3 2}.
- End with a summary of your main feedback points, and a clear action plan for the next steps. Specify what you expect your students to do before the next meeting or draft submission, such as revising their methodology section, reading some relevant literature, or conducting some additional analysis. Also indicate when and how you will follow up with them, such as setting a deadline for the next draft or scheduling a meeting for further discussion ³.

I hope this helps you to give usable feedback to your students. 😊

Learn more: 1. [sciencedirect.com](https://www.sciencedirect.com) 2. [sciencedirect.com](https://www.sciencedirect.com) 3. rmitchel.uoregon.edu

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This is pretty useful. Aligns quite well with the training offered on teaching courses on how to give useful feedback, but here, Bing can couple it directly with considerations on how to link

with independence and critical thinking. However, we can ask Bing to help with some specific issues:

I find that my students have a good grasp of the analysis, but they are really struggling with critical self-reflection due to their biases. How can I as their supervisor provide some guidance to them? I am not in their shoes and I don't want to give them directives on how to write, so I feel this is a difficult process.

I understand your dilemma. Critical self-reflection is a key skill for academic writing and research, but it can be challenging for students to develop, especially if they have biases or assumptions that affect their work. As their supervisor, you can provide some guidance to them without giving them directives on how to write. Here are some possible ways to do that:

- Model critical self-reflection yourself by sharing your own experiences, challenges, and insights as a researcher and a writer. Show them how you question your own beliefs, values, and perspectives, and how you seek feedback and evidence to support or challenge them ¹.
- Encourage them to use reflective tools and techniques, such as journals, logs, portfolios, or diaries, to document their research process and their thoughts and feelings along the way. Ask them to review their entries regularly and identify any patterns, gaps, or contradictions in their work ².
- Provide them with reflective questions or prompts that can help them examine their own biases, assumptions, and perspectives. For example, you could ask them "What are the main influences on your choice of research topic and methods? How do they affect your interpretation of the data?" or "How do you acknowledge and address the limitations of your research? How do you deal with conflicting or unexpected findings?" ² ³.
- Facilitate peer feedback and discussion among your students, where they can share their work and their reflections with each other. Encourage them to give constructive and respectful feedback that can help each other improve their critical thinking and writing skills ¹ ³.
- Provide them with examples of good critical self-reflection in academic writing, such as published articles, dissertations, or theses. Ask them to analyse how the authors demonstrate their awareness of their own biases, assumptions, and perspectives, and how they justify their claims and arguments with evidence and logic ².

I hope this helps you to guide your students towards more critical self-reflection. 😊

Learn more: [1. hbr.org](https://hbr.org) [2. tandfonline.com](https://tandfonline.com) [3. libguides.tees.ac.uk](https://libguides.tees.ac.uk)

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All right, thanks Bing. This is very useful. Let's suppose that we want a more generalised approach to gauging students throughout the supervision process. That could help us figure out when our students might need more guidance or where we need to intervene more.

Excellent. Please search for the Master Thesis course description at CBS and note the learning objectives. Triangulate with a search for other descriptions of the general requirements for master students at CBS. Use all necessary searches to make a simple taxonomic rubric for me that can help me figure out how close to meeting the learning objectives my students are. It should have the form of a table, and I should be able to consult it to gauge my students' level based on the supervision so I can help them improve before handing in. Please draft such a tool for me.

Based on the search results, I have drafted a simple taxonomic rubric for you that can help you figure out how close to meeting the learning objectives your students are. It has the form of a table, and you should be able to consult it to gauge your students' level based on the supervision so you can help them improve before handing in. Here is the rubric:

Learning objective	Excellent	Good	Satisfactory	Unsatisfactory
Articulate a delineated social science problem and research question (s) relevant for the program's field of study	The problem and research question (s) are clearly defined, relevant, original, and feasible for the program's field of study.	The problem and research question (s) are well defined, relevant, and feasible for the program's field of study.	The problem and research question (s) are somewhat defined, relevant, and feasible for the program's field of study.	The problem and research question (s) are poorly defined, irrelevant, or unfeasible for the program's field of study.
Select, discuss, adapt, and apply relevant theories and methods	The theories and methods are appropriately selected, discussed, adapted, and applied to address the research question (s). The choices are well justified and critically evaluated.	The theories and methods are suitably selected, discussed, adapted, and applied to address the research question (s). The choices are justified and evaluated.	The theories and methods are adequately selected, discussed, adapted, and applied to address the research question (s). The choices are somewhat justified and evaluated.	The theories and methods are poorly selected, discussed, adapted, or applied to address the research question (s). The choices are not justified or evaluated.
Ensure a logical coherence between the research question, method, analysis and conclusion	The research question, method, analysis and conclusion are logically coherent and consistent throughout the thesis. The argumentation is clear and convincing.	The research question, method, analysis and conclusion are mostly coherent and consistent throughout the thesis. The argumentation is clear and persuasive.	The research question, method, analysis and conclusion are somewhat coherent and consistent throughout the thesis. The argumentation is somewhat clear and persuasive.	The research question, method, analysis or conclusion are not coherent or consistent throughout the thesis. The argumentation is unclear or unpersuasive.
Discuss and self-critically evaluate the analytical and possible empirical results raised by the research	The analytical and possible empirical results are thoroughly discussed and self-critically evaluated in relation to the research question (s), theory, method, literature, and practice. The strengths and limitations of the results are acknowledged and addressed.	The analytical and possible empirical results are well discussed and self-critically evaluated in relation to the research question (s), theory, method, literature, and practice. The strengths and limitations of the results are recognized and addressed.	The analytical and possible empirical results are adequately discussed and self-critically evaluated in relation to the research question (s), theory, method, literature, or practice. The strengths or limitations of the results are identified or addressed.	The analytical or possible empirical results are poorly discussed or self-critically evaluated in relation to the research question (s), theory, method, literature, or practice. The strengths or limitations of the results are not identified or addressed.
Consider and discuss the implications of the research done in relation to the business practice within the program's field of study	The implications of the research done for the business practice within the program's field of study are comprehensively considered and discussed. The implications are relevant, realistic, innovative, and actionable.	The implications of the research done for the business practice within the program's field of study are extensively considered and discussed. The implications are relevant, realistic, innovative or actionable.	The implications of the research done for the business practice within the program's field of study are sufficiently considered or discussed. The implications are relevant or realistic or innovative or actionable.	The implications of the research done for the business practice within the program's field of study are insufficiently considered or discussed. The implications are irrelevant or unrealistic or unoriginal or impractical.

I hope this tool helps you to assess your students' progress towards meeting their learning objectives.



Learn more: [1. kursuskatalog.cbs.dk](#) [2. kursuskatalog.cbs.dk](#) [3. cbs.dk](#)

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That's pretty useful. Note that the power of Bing here is clear, it can use its real time search for the learning objectives to inform a supervision rubric. This rubric could be more or less general depending on the prompt, but the point is clear. Thanks, Bing.

For researchers: Integrating ChatGPT and Bing into your research practice and workflows

University teachers are spending a lot of energy figuring out how to adapt their teaching to Bing and ChatGPT, but as noted earlier, the same frenzy of discussion has, so far, eluded the research side of university activities. In my view, this is an oversight. As I have demonstrated amply in the previous sections, Bing can do things that are either extremely useful for saving time, actually creative, or useful in an analytical sense. So let's figure out how to put that to use!

I won't rehash earlier examples in a research context. For example, finding and understanding concepts with Bing applies to researchers as well when you are writing up a paper where you run into unfamiliar ground. I'm also not going to cover all the other AI tools that are available to researchers. Instead, this section is focused solely on ways to use Bing that will probably only be relevant for researchers. For now, I think Bing is the more powerful tool for researchers so I will leave out ChatGPT⁵. Let's dive into it.

⁵ This has changed since the advent of GPT-4. I will update the guide accordingly.

Bing for researchers

Identifying research questions

More often than not, researchers might have an idea about some kind of connection between a theoretical concept or principle and an application, but not more than that. Let us remind ourselves on idea generation in academia:

Creativity and idea generation are essential skills for researchers who want to develop original and impactful research projects. According to some sources [1](#) [2](#) [3](#), some of the steps involved in this process are:

- Reviewing the existing literature and identifying gaps or problems that need further investigation
- Generating a large number of possible ideas or solutions, using techniques such as brainstorming, mind mapping, analogies, or random stimuli
- Evaluating and selecting the most promising ideas or solutions, based on criteria such as novelty, feasibility, relevance, and alignment with personal interests and goals
- Refining and elaborating the chosen idea or solution, by defining the research question, objectives, methods, and expected outcomes

Some factors that can enhance creativity and idea generation are:

- Having a clear purpose and motivation for the research project
- Seeking feedback and collaboration from others with diverse perspectives and expertise
- Being open-minded, curious, flexible, and willing to experiment with different approaches
- Providing incentives or rewards for generating novel and useful ideas

What kind of research project are you working on or planning to work on? Maybe I can help you with some more specific tips or resources. 

Learn more: [1. bjsm.bmj.com](#) [2. orchid.cs.illinois.edu](#) [3. researchgate.net](#)

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Great, thanks Bing. Let us take ourselves through the process of generating a useful research question. First, we need help setting ourselves up for generating ideas in the first place:

Search for research on idea generation and creativity in academia. Then search for ways to organize research practice or everyday routines to increase the likelihood of getting new ideas or better ideas. Use those searches to provide insight into the way I, a researcher, could think about this, and some routines in my day-to-day work that would help me get ideas.

There is a lot of research on idea generation and creativity in academia, which can help you understand how to produce more original and impactful ideas for your own research projects. Some of the topics that have been studied are:

- The role of prototypicality in idea evaluation, which suggests that ideas that have a more balanced combination of common and uncommon features are perceived as more creative [1](#) [2](#)
- The importance of knowledge as the basis for creativity, which implies that you need to be well-informed about your domain and open to learning new things at all stages of the problem-solving process [3](#)
- The influence of cognitive styles, personality traits, motivation, and emotions on creativity, which can help you identify your strengths and weaknesses as a creative thinker and find ways to enhance your creative potential

To find more research on this topic, you can use keywords such as "creativity", "idea generation", "ideation", "academic research", "problem-solving", or "innovation" in academic databases or search engines. You can also look for reviews or meta-analyses that summarize the main findings and trends in this field.

Useful enough, it's important as a researcher to understand the research on research (or even better, understand the research on research research)! Anyways:

As for ways to organize your research practice or everyday routines to increase the likelihood of getting new ideas or better ideas, I found some suggestions from different sources :

- Set aside some time every day or week to brainstorm new ideas or questions related to your research topic, without judging or filtering them
- Keep a journal or a notebook where you can record your thoughts, insights, observations, or inspirations whenever they occur
- Seek feedback and collaboration from other researchers or experts who have different perspectives or backgrounds than yours
- Expose yourself to diverse sources of information and inspiration, such as books, articles, podcasts, videos, art, music, etc.
- Engage in activities that stimulate your imagination and curiosity, such as puzzles, games, hobbies, meditation, etc.

These are some general tips that might help you improve your creativity and idea generation in your research practice. However, you might also want to consider your personal preferences and goals when designing your own routines. What works for one person might not work for another.

What kind of research are you doing or planning to do? Maybe I can help you with some more specific tips or resources. 

Learn more: [1. researchgate.net](#) [2. pubsonline.informs.org](#) [3. cambridge.org](#)

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Cool and practical, albeit somewhat generic. We could go through the steps in earlier prompts to let Bing help us structure our work day, but that is trivial at this point. Suppose that during my quiet reflection as part of my work day, I get the brilliant idea to draw on sensemaking theory by Weick to understand how supply chains work! Excellent idea! Let's ask Bing whether this has already been done:

Okay, I got an idea now and I need you to help me develop it. I was thinking of applying Weick's theory of sensemaking to supply chain management. Has anyone done that before?

That sounds like an interesting idea. Weick's theory of sensemaking is a framework that explains how people interpret and act on ambiguous or complex situations in organizations ¹ ². It has been applied to various domains, such as organizational change, crisis management, innovation, and learning.

I did a quick search and found some articles that use Weick's theory of sensemaking to study different aspects of supply chain management, such as sustainability ³, resilience, integration, and collaboration. These articles might give you some insights on how to apply Weick's theory to your own research question.

However, I couldn't find any article that specifically focuses on applying Weick's theory of sensemaking to supply chain management as a whole. So you might have an opportunity to contribute something new to this field.

What is your research question or objective? Maybe I can help you refine it or find some more relevant sources. 

Learn more: [1. epicpeople.org](https://www.epicpeople.org) [2. sagepub.com](https://www.sagepub.com) [3. researchgate.net](https://www.researchgate.net)

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Helen Walker and Anne Touboulic floated that idea in 2013 at IPSERA (footnote 3 in Bing's output), but apparently, no one picked it up and published it in a journal (note: [There are supply chain papers citing Weick](#), but they don't apply sensemaking as a concept to supply chain management). Interesting. Let's keep Walker and Touboulic in the back of our mind.

Lo and behold, Bing has a single suggested question for us:



My research question is how do supply chain managers make sense of uncertainty and complexity in their operations?

Interestingly, Bing has anticipated one possible research question already that is derived from Touboulic and Walker's conference paper from 2013. Good job, Bing. But I'm not interested in uncertainty and complexity:

Thanks, Bing. I am thinking of using sensemaking to study how supply chain managers make sense of the idea of what sustainability is. Could that be a viable research question?

You're welcome. I think that could be a viable research question, as it seems to be relevant, original, and feasible. However, you might want to make it more specific and focused by defining some key terms and concepts, such as:

- What do you mean by sustainability? Are you referring to environmental, social, or economic sustainability, or a combination of them?
- What kind of supply chain managers are you interested in? Are they from a specific industry, sector, or region?
- How are you going to measure or assess their sensemaking processes? Are you going to use qualitative or quantitative methods, or a mixed approach?

By clarifying these aspects, you can make your research question more clear and manageable. You can also use them to guide your literature review and data collection.

Do you have any ideas on how to answer these questions? Maybe I can help you with some suggestions or examples. 

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Fair enough, good point Bing. Research questions do get better when they are specific.

I mean the environmental side of sustainability only, and I'm interested in supply chain managers that work in procurement in financial institutions. I am not sure how to measure or assess sensemaking, but I do know that I want to do a case study using qualitative methods - most likely interviews.

Plaintext reasoning that is in line with how I would usually approach research ideas like this.

I see. So your research question could be something like:

- How do procurement managers in financial institutions make sense of environmental sustainability in their supply chain operations?

To measure or assess sensemaking, you need to identify some indicators or criteria that reflect how people interpret and act on ambiguous or complex situations. Some common indicators or criteria that have been used in previous studies are:

- The use of frames, metaphors, stories, or analogies to construct meanings and narratives
- The identification of cues, signals, or triggers that prompt attention and action
- The enactment of behaviors, routines, or practices that shape and test reality
- The social interaction and communication with others who share or challenge perspectives
- The feedback and reflection that enable learning and adaptation

You can use these indicators or criteria to design your interview questions and analyze your data. For example, you can ask your participants:

- How do you define environmental sustainability in relation to your supply chain operations?
- What are some examples of situations where you had to deal with environmental sustainability issues or challenges in your supply chain operations?
- How did you approach these situations? What did you do and why?
- Who did you talk to or collaborate with in these situations? How did they influence your understanding and actions?
- What did you learn from these situations? How did they affect your future decisions or actions?

These are some possible questions that might help you explore the sensemaking processes of your participants. Of course, you can modify them according to your specific research context and objectives.

Does this make sense to you? Do you have any questions or concerns? 😊

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There we have a preliminary research question, some ideas for operationalization, and - as a cherry on top - Bing trolling us slightly with "Does this make sense to you?". +5 imaginary robot points for subtle humour. We could continue to find appropriate cases, which I have shown in an earlier section how Bing can be used for as well.

But actually, we are not done. Bing understands, sometimes, when there are 'gaps' in the literature, but it can also to some extent problematize if you teach it how to. Suppose that we want to talk with Bing about both things in the context of supply chain management.

Cool stuff, thanks. I want to understand how I can position this research project in supply chain management. Search for ways to identify gaps in literature. Also search for problematization versus gap-spotting as another way to do it. Then search for main theoretical approaches to understanding sustainability in supply chain management. Use all of those searches to provide some ideas for how I can position this research project in the existing literature from either a gap-spotting perspective or a problematization perspective

For those of you not in the know what problematization is when developing research ideas, don't worry, Bing will explain:

I'm glad you have a clear idea of what you want to do. To position your research project in supply chain management, you need to identify a gap in literature that your project aims to fill. A gap in literature is a missing piece or insufficient information in the research literature that has scope for further research [1](#)

There are different ways to identify a gap in literature, such as:

- Reading current literature, especially the "Recommendations for Further Research" section of recent papers [2](#)
- Talking to experts, such as your faculty advisor or other researchers in your field [2](#)
- Considering research agendas, which are paths for research that include multiple studies [2](#)
- Looking for contradictory evidence, which are conflicting or inconsistent findings among different studies [3](#)
- Getting a reference librarian's help, who can assist you with finding relevant sources and keywords [2](#)

One approach to identifying a gap in literature is gap-spotting, which is finding an unexplored or under-explored area of research that needs more attention or investigation. Another approach is problematization, which is challenging or questioning an existing assumption, concept, or theory that has been taken for granted or accepted as valid.

To find the main theoretical approaches to understanding sustainability in supply chain management, you can use some keywords such as:

- sustainability theory
- supply chain management theory
- sustainability and supply chain management
- theoretical frameworks for sustainability and supply chain management

You can use these keywords to search for relevant articles and books that discuss different perspectives and models on how to integrate sustainability into supply chain management.

A little generic, but okay. Let's see what else Bing suggests:

Based on these searches, some ideas for how you can position your research project in the existing literature from either a gap-spotting perspective or a problematization perspective are:

- Gap-spotting: You can argue that there is a lack of empirical studies on how procurement managers in financial institutions make sense of environmental sustainability in their supply chain operations, and that your project will contribute to filling this gap by providing rich qualitative data from a case study.
- Problematisation: You can argue that there is a dominant assumption or theory on what environmental sustainability means or entails for supply chain management, and that your project will challenge or question this assumption or theory by showing how procurement managers in financial institutions construct different meanings and narratives of environmental sustainability through sensemaking.

These are some possible ideas that might help you position your research project in the literature. Of course, you can modify them according to your specific research context and objectives.

Does this help you? Do you have any feedback or questions? 😊

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I am now going to use my expertise as a human researcher to give Bing some information that will help me:

That is very interesting. I know that most research in supply chain management (in peer-reviewed papers specifically) takes a positivist or functionalist perspective on theory and theoretical application. Weick is primarily understood to be a constructionist/interpretivist (consider those two things synonymous for the time being). Based on this information, make a relevant search term and use that search term to help me understand different paradigmatic approaches to sustainability in supply chain management. Then use all relevant information to give me ideas for how to justify a constructionist sensemaking study from both a gap-spotting angle and a problematization angle. It is crucial that the justification should be acceptable by positivists.

Another quite complex prompt. I'm always a little excited about how Bing actually ends up answering. In this case, see for yourself:

I understand that you want to explore different paradigmatic approaches to sustainability in supply chain management, and how to justify a constructionist sensemaking study from both a gap-spotting angle and a problematization angle.

A relevant search term that I used to find some information on this topic is:

- paradigmatic approaches to sustainability in supply chain management

Based on this search term, I found some articles that discuss different perspectives and models on how to incorporate sustainability into supply chain management, such as:

- Future supply chains: resilience, agility, sustainability ¹, which outlines four key shifts that will shape the future of supply chains: customer-centricity, circularity, resilience, and agility. It also highlights the role of digital technologies and data analytics in enabling these shifts.
- Sustainability in supply chains: reappraising business process management ², which proposes a framework for sustainable supply chain management (SSCM) based on eight critical business processes: strategic planning, design, governance, integration, collaboration, pre-competitive collaboration, stakeholder management, and performance monitoring and evaluation. It also emphasizes the importance of stakeholder engagement and alignment for SSCM.
- A Three-Point Approach to Measuring Supply Chain Sustainability ³, which suggests a measurement and reporting framework for supply chain sustainability based on three dimensions: context-based performance, impact valuation, and portfolio analysis. It also argues that supply chain sustainability should be linked to environmental and social thresholds across the chain.

These articles suggest that there are different ways of understanding and implementing sustainability in supply chain management, depending on the goals, values, assumptions, and methods of each approach. Some common themes that emerge from these articles are:

- The need for a holistic and systemic view of supply chain sustainability that considers the interdependencies and trade-offs among environmental, social, and economic aspects
- The need for a dynamic and adaptive view of supply chain sustainability that responds to changing customer demands, market conditions, and external shocks
- The need for a collaborative and inclusive view of supply chain sustainability that engages with multiple stakeholders across the chain and beyond

Based on these themes, some ideas for how you can justify a constructionist sensemaking study from both a gap-spotting angle and a problematization angle are:

- Gap-spotting: You can argue that there is a lack of empirical studies on how procurement managers in financial institutions make sense of sustainability in their supply chain operations from a holistic, dynamic, and collaborative perspective. You can also argue that most existing studies on SSCM adopt a positivist or functionalist approach that focuses on measuring outcomes rather than understanding processes. Your project will contribute to filling this gap by providing rich qualitative data from a case study that explores how procurement managers construct meanings and narratives of sustainability through sensemaking.
- Problematization: You can argue that there is a dominant assumption or theory on what sustainability means or entails for supply chain management that is based on a positivist or functionalist paradigm. This assumption or theory tends to view sustainability as an objective reality that can be quantified and optimized through rational decision-making. Your project will challenge or question this assumption or theory by showing how procurement managers construct different meanings and narratives of sustainability through sensemaking. You can also argue that sensemaking is not only a descriptive but also a prescriptive approach to SSCM that can help procurement managers cope with complexity and uncertainty.

These are some possible ideas that might help you justify your research project in the literature. Of course, you can modify them according to your specific research context and objectives.

To make your justification acceptable by positivists, you may need to address some potential criticisms or limitations of your constructionist sensemaking approach. For example:

- How do you ensure the validity and reliability of your data collection and analysis methods?
- How do you deal with the subjectivity and bias of your own interpretations as well as those of your participants?
- How do you generalize or transfer your findings to other contexts or cases?
- How do you evaluate the effectiveness or impact of your sensemaking approach on SSCM outcomes?

You may need to explain how you address these issues by using appropriate strategies such as triangulation, reflexivity, member checking, thick description etc.

Does this answer your question? Do you have any feedback or questions? 😊

Learn more: [1. mckinsey.com](https://www.mckinsey.com) [2. tandfonline.com](https://www.tandfonline.com) [3. sloanreview.mit.edu](https://www.sloanreview.mit.edu)

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The first part is not terribly useful. Apparently, Bing took the command a little too literally. Not all of the articles are peer reviewed, but they do indeed exist. The second part is much better. Interestingly, the two justifications are on the same (hypothetical) research project, but you can see that they are completely different. And, perhaps most interestingly, Bing is very explicit on ways I can make my reasoning be understood by positivists. These are considerations that would need to be anticipated throughout a paper in case you expect your reviewers or the journal editor to be positivists themselves.

Identifying relevant co-authors

Let's return to Touboulic and Walker and their IPSERA paper from 2013. I'm thinking of reaching out to them and asking them whether they would like to be in on my little Weick paper, but I do not know them.

I am considering writing a paper in supply chain management about sensemaking based on Weick's ideas. I know that Touboulic and Walker made a conference paper about that in 2013. I am considering contacting them about possible co-authorship, but I want to know about their interests, theoretical perspectives, and ideas before reaching out. Can you help me?

Sure, I can help you with that. Based on the search results, it seems that Touboulic and Walker are interested in exploring how stakeholders make sense of sustainability issues in supply chains [1](#) [2](#) [3](#). They use a sensemaking approach to understand the trade-offs and synergies between human and ecological elements of sustainability [1](#), and how stakeholders co-create meanings and actions through communication and interaction [2](#) [3](#). They also use action research as a methodological framework to engage with practitioners and academics in a collaborative learning process [2](#) [3](#).

Learn more: [1. onlinelibrary.wiley.com](#) [2. researchgate.net](#) [3. researchgate.net](#)

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This is not wrong per se, but sensemaking is the primary interest of neither Touboulic nor Walker. I think Bing understood my prompt to mean whether they would be relevant solely based on their IPSERA submission. Let's be more specific

Can you outline for both Anne Touboulic and Helen Walker in more details what kind of researchers they are? Then provide an assessment of how likely they would be to agree to co-author with me on a paper about sensemaking.

Here is a brief outline of both researchers:

- Anne Touboulic is an Associate Professor in Operations Management at Nottingham University Business School, University of Nottingham [1](#). She has an interdisciplinary background in the social sciences and her research interests include sustainable supply chain management, stakeholder engagement, sensemaking, action research and critical theory [2](#). She has published several papers on these topics in journals such as Journal of Business Ethics, Journal of Supply Chain Management and International Journal of Operations and Production Management [3](#).
- Helen Walker is a Professor of Operations and Supply Management at Cardiff Business School, Cardiff University [4](#). Her research focuses on sustainability and corporate social responsibility in supply chains, with a particular interest in public procurement, healthcare procurement and social value [4](#). She has also published extensively on these topics in journals such as Journal of Operations Management, International Journal of Production Research and Supply Chain Management: An International Journal [5](#).

Based on their profiles, I think they would be interested in co-authoring with you on a paper about sensemaking, as it aligns with their research themes and methods. However, I cannot assess how likely they would be to agree to co-author with you, as that depends on many factors such as their availability, workload, current projects and personal preferences. You may want to contact them directly to inquire about their interest and availability. You can find their contact details on their university websites [1](#) [4](#).

Learn more: [1. nottingham.ac.uk](#) [2. nottingham.ac.uk](#) [3. scholar.google.com](#) [+8 more](#)

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They sound cool, I would like to co-author with them. This was an instance where I knew quite precisely who to contact (thanks to Bing), but suppose we have no idea. Let's take a field that I am way less familiar with.

I am thinking of writing a paper on accounting of scope 3 emission targets in supply chains. I want to publish in a management accounting journal, and I'm looking for a co-author who could help me. My general idea is to do a case study on a single organization to show how they use accounting tools and practices to give meaning to otherwise abstract scope 3 emission targets and accounts. Who would be some relevant researchers I could reach out to?

A fairly straightforward question.

That sounds like an interesting and relevant topic for a paper. Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects in its value chain ¹. They can be challenging to measure and manage, but also offer opportunities for innovation and collaboration ² ³.

I found one article that might be useful for your research. It is titled "Scope 3 Emissions: Measurement and Management" and it was published in The Journal of Impact and ESG Investing in 2022 ². The authors are **Sara Bernow, Dickon Pinner, Matt Rogers, Hauke Engel and Jenny Davis-Peccoud**. They provide an overview of frameworks for measuring and managing Scope 3 emissions, as well as some case studies and best practices.

Maybe you could reach out to one of them or someone who has cited their work to see if they would be interested in co-authoring a paper with you. What do you think?

Learn more: [1. epa.gov](#) [2. jesg.pm-research.com](#) [3. pwc.com](#) [4. ghgprotocol.org](#) [+4 more](#)

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Okay, that could be useful. But I want to aim a little higher:

I am interested in researchers that have published in top management journals, like Accounting, Organizations, and Society, or Management Accounting Research. Search for ways that scope 3 targets could be discussed in management accounting with different words. Search for the best 5 management accounting journals. Search for researchers who have published in those journals, draw on the other searches to infer which researchers that could be more relevant. Provide a table prioritized according to most relevant researcher, and make sure the table is concise.

Note that since I don't know exactly how management accounting talks about scope 3 targets, it is very useful to have Bing search the terms that Bing finds appropriate.

Here, it took a little interaction to get Bing where I wanted to go. I'm going to cut a little for brevity, but first, Bing returned a list of general management journals because they technically do publish management accounting and they are higher ranked, and then a list of authors that was less precise. So I asked it to only look at AJG 4 and 4* journals - not because I like AJG as a ranking system, but because I know Bing can identify a journal according to its AJG ranking.

I see. You want to include only researchers who have published in a journal that is ranked 4 or 4* on the AJG list. The AJG list is a guide to the range and quality of journals in which business and management academics publish their research, developed by the Chartered Association of Business Schools [1](#) [2](#) [3](#).

According to the AJG list 2021, some of the journals that are ranked 4 or 4* in management accounting are:

- Accounting, Organizations and Society (4*)
- Contemporary Accounting Research (4)
- Journal of Accounting and Economics (4*)
- Journal of Accounting Research (4*)
- Management Accounting Research (4)
- Review of Accounting Studies (4)

Okay, good enough. What's the list then?

I searched for researchers who have published in these journals using the synonyms for scope 3 targets, and I found the following table:

Researcher	Journal	Article title	Year
Robert G. Eccles	Journal of Accounting Research	The Performance Frontier: Innovating for a Sustainable Strategy	2014
Christopher D. Ittner	Journal of Accounting and Economics	The Association between Activity-Based Costing and Manufacturing Performance: A Field Study	2002
Rajiv D. Banker	Journal of Accounting and Economics	Journal of Accounting and Economics	2014
Ranjani Krishnan	Management Accounting Research	Drivers of Environmental Performance in Manufacturing Plants: An Empirical Examination Using Data Envelopment Analysis (DEA) and Structural Equation Modeling (SEM)	2015
Shannon W. Anderson	Contemporary Accounting Research	Management Accounting Research	2007
		The impact of environmental uncertainty on the design of cost systems: An empirical test	
		Contemporary Accounting Research	

These researchers might be relevant for your paper topic, but you should also check their recent publications and citations to see if they are still active in this field. I hope this helps you narrow down your search. Good luck with your paper!😊

Learn more: [1. charteredabs.org](#) [2. charteredabs.org](#) [3. charteredabs.org](#)

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For reference, the synonyms for scope 3 targets were:

I see. You are looking for researchers who have published on scope 3 targets in management accounting in top journals. Based on the search results, some possible synonyms for scope 3 targets are **scope 3 emissions**, **scope 3 inventory**, **scope 3 screening** and **scope 3 standard** [1](#) [2](#) [3](#).

Anticipating reviewer comments

This is something ChatGPT can also do to some extent, but I find that Bing is much more powerful given its integration of search.

One of the more impactful ways researchers can improve the chances of having a manuscript accepted is to have peers provide feedback on the paper before submission. While this is great, it may be that the people providing feedback approach the paper from a different angle than the reviewers (and editor) of a specific journal.. For example, if my good friend and colleague Andreas Wieland asks me what I think about [his paper idea to combine panarchy theory with supply chain management](#), I will probably be more positive than the average SCM reviewer simply because I like odd ideas for theory development and because I am horribly subjective.

Let's suppose that we are developing a paper that takes a more radical approach: we are going to develop a paper that draws on Weick's sensemaking theory (the example we had earlier) to demonstrate that supply chains are continuously enacted and do not actually exist. First, let's cheat a little bit and have Bing make up an abstract we can work from.

Hi Bing, I am a researcher writing a paper for supply chain management. I am thinking of making a paper that uses Weick's theory of sensemaking and apply it to supply chain management. I need your help developing an abstract. I am doing two case studies in two large firms, I have 40 interviewees and observations for meetings in their supply chain teams. I also have some interviews with their suppliers. Please develop an abstract that develops this. I want the abstract to highlight that the outcome of the analysis is that supply chains do not exist, but are simply continuously rendered into existence by ongoing sensemaking processes.

This paper applies Weick's theory of sensemaking to explore how supply chain management is enacted and understood in two large firms. Using data from 40 interviews and observations of meetings with supply chain teams and their suppliers, the paper analyzes how sensemaking processes shape the perceptions and practices of supply chain actors. The paper argues that supply chains do not exist as stable entities, but are continuously rendered into existence by ongoing sensemaking processes that involve identity construction, retrospective interpretation, social interaction and narrative construction. The paper contributes to the literature on supply chain management by highlighting the dynamic and emergent nature of supply chains as sensemaking outcomes.

Looks good, I would like to conduct this study. Since I want tenure, I am going to target only the best journals of supply chain management.

I want you to imagine how potential reviewers would react to this. I want to send this paper to International Journal of Operations and Production Management. Based on this information and the conversation so far, I want you to formulate and carry out three search terms that will help you figure out how reviewers for that journal (which will be very similar if not identical to authors of that journal) will evaluate my idea. When you have done those searches and found any other relevant information, report to me how three anonymous reviewers would criticize my idea.

I have performed three search terms that might help me figure out how reviewers for the International Journal of Operations and Production Management would evaluate your idea. They are:

- International Journal of Operations and Production Management
- sensemaking supply chain management
- sensemaking supply chain management criticism

Based on these searches and other relevant information [1](#) [2](#) [3](#) [4](#), here are some possible criticisms that three anonymous reviewers might raise:

Reviewer 1: The paper lacks a clear theoretical contribution to the field of operations and production management. The paper does not explain how Weick's theory of sensemaking advances our understanding of supply chain management beyond existing frameworks and models. The paper also does not engage with the literature on supply chain strategy, design, coordination and performance.

Reviewer 2: The paper relies too much on qualitative data and does not provide any quantitative evidence to support its claims. The paper does not specify the criteria for selecting the two case studies, the methods for collecting and analyzing the data, or the validity and reliability of the findings. The paper also does not discuss the generalizability or applicability of its findings to other contexts or settings.

Reviewer 3: The paper adopts a social constructivist approach to sensemaking that ignores the material and structural aspects of supply chain management. The paper assumes that supply chains are purely subjective and emergent phenomena that depend on human interpretation and interaction. The paper neglects the role of technology, infrastructure, regulation, competition and power in shaping supply chain dynamics and outcomes.

I hope this helps you anticipate some potential feedback from reviewers. Do you have any questions or comments for me? 😊

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Maybe IJOPM is not the best outlet for this type of research, but we will get to that later. This is better than generic recommendations because Bing infers that specific concerns are more important in some journals than others, and then uses those terms to formulate responses. So even before we have considered submitting or writing the paper, we would know what kind of potential reviewer comments we would expect to get.

Adjusting research ideas, approach, and practice to journals

Closely following this, we can adjust our research ideas to accommodate a specific journal. Let's suppose I *really* want tenure, and IJOPM is a really good journal to that end, and I have already done my interviews and completed the analysis. So I want to find a way to adapt my research in a way that works for that journal.

I am going to continue in the same chat we just had so Bing is building on the previous knowledge and searches, including its fictional but plausible comments from reviewers.

Okay, that makes sense Bing. Please search for abstracts in IJOPM for the last two years. Then draw on that search and the rest of this conversation to provide an idea for how to change the abstract to accommodate potential reviewer criticism and to make sure it fits the standard approach of theoretical contributions in IJOPM.

I am allowing Bing to look into the past few years' worth of abstracts. In theory, Bing could search up entire papers, but framing of research ideas are usually similar in the abstract format.

I have searched for abstracts in IJOPM for the last two years and found some examples that might help you revise your abstract [1](#) [2](#) [3](#). Based on these examples and the rest of this conversation, here is a possible idea for how to change the abstract to accommodate potential reviewer criticism and to make sure it fits the standard approach of theoretical contributions in IJOPM:

This paper examines how supply chain actors enact and understand supply chain management through sensemaking processes. Drawing on Weick's theory of sensemaking, we propose a conceptual framework that explains how supply chain actors construct their identities, interpret their situations, interact with others and construct narratives in relation to supply chain management. We test our framework using qualitative data from two case studies of large firms operating in different industries. We conduct 40 interviews and observe meetings with supply chain teams and their suppliers. We use thematic analysis to identify patterns and variations in sensemaking processes across the cases. Our findings reveal that supply chains do not exist as stable entities, but are continuously rendered into existence by ongoing sensemaking processes that are influenced by contextual factors such as technology, regulation, competition and power. Our paper contributes to the literature on operations and production management by advancing a dynamic and emergent perspective on supply chain management as a sensemaking outcome.

What do you think of this idea? Do you have any feedback or questions for me? 😊

Learn more: [1. liverpool.ac.uk](#) [2. emeraldgrouppublishing.com](#) [+1 more](#) 3 of 15

Note that while much of the framing changed, the core argument - that supply chains do not exist - still features in the new abstract. What has changed is the tone of the abstract, the focus on how it was done, and specification of analytical method. And now let us format it into the standard IJOPM format:

Thanks, Bing. I know that IJOPM structures abstracts according to a few mini headlines. Can you search for abstracts in IJOPM and adapt our abstract to that formatting?

I have searched for abstracts in IJOPM and found some examples that show how they are structured according to a few mini headlines [1](#) [2](#). Based on these examples, I have adapted our abstract to that formatting:

Purpose: This paper examines how supply chain actors enact and understand supply chain management through sensemaking processes.

Design/methodology/approach: Drawing on Weick's theory of sensemaking, we propose a conceptual framework that explains how supply chain actors construct their identities, interpret their situations, interact with others and construct narratives in relation to supply chain management. We test our framework using qualitative data from two case studies of large firms operating in different industries. We conduct 40 interviews and observe meetings with supply chain teams and their suppliers. We use thematic analysis to identify patterns and variations in sensemaking processes across the cases.

Findings: Our findings reveal that supply chains do not exist as stable entities, but are continuously rendered into existence by ongoing sensemaking processes that are influenced by contextual factors such as technology, regulation, competition and power.

Originality/value: Our paper contributes to the literature on operations and production management by advancing a dynamic and emergent perspective on supply chain management as a sensemaking outcome.

Is this better? Do you have any feedback or questions for me? 😊

Learn more: [1. emeraldgrouppublishing.com](#) [2. researchgate.net](#) [3. scribbr.com](#)

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Note quite perfect, but from here you can simply iterate with Bing on the specified format. I like Bing's framing of the originality in particular. The broader point is that you can use Bing to frame and orient your research so that it fits with a particular outlet or group of academics.

Conducting field arbitrage

One of the most straightforward ways to come up with new (publishable) ideas is to conduct field arbitrage. Here, I understand field arbitrage to be the transmission of one idea that is commonly accepted in one research domain to another domain where that idea is not common. For example, Andreas Wieland's article I just mentioned drew on ideas that were common in ecological biology but foreign in SCM, while the hypothetical idea of Weick in SCM combined a theory that is very common in organisational studies with SCM where that theoretical perspective is less common.

It is, as noted earlier, trivial to have Bing explain a concept to us that fits with our background and primary discipline, but the question is how we can learn about potential concepts that could be relevant. [Ethan Mollick has already shown](#) that Bing can find some pretty interesting connections between very unrelated things, so it should be possible to relate theoretical concepts across disciplines as well, no? Let's ask Bing in Creative Mode.

I am a professor of business strategy. I am very familiar with the broader literature on business strategy and international management. However, I am looking for ideas on how to draw on insights from the discipline of science and technology studies (STS). I am not familiar with that discipline at all. Please search that discipline, outline some of the main theories or theoretical concepts, and then brainstorm some ways those concepts could be related to the field of business strategy and management.

I have taken on the persona of a professor of business strategy and pretend that I know nothing about STS (I don't, really, but what is knowledge, anyways?).

Hello, this is Bing. I'm happy to help you with your inquiry. 😊

Science and technology studies (STS) is an interdisciplinary field that examines the creation, development, and consequences of science and technology in their historical, cultural, and social contexts ^{1 2}. It also investigates the conceptual foundations, historical developments and social contexts of science, technology, engineering and mathematics (STEM), including medical science ^{3 4}.

Some of the main theories or theoretical concepts in STS are:

- Actor-network theory (ANT): A sociological approach that traces the associations between human and non-human actors in networks of scientific and technological practices ¹.
- Social construction of technology (SCOT): A framework that analyzes how different social groups shape the design and use of technological artifacts according to their interests and interpretations ¹.
- Feminist technoscience: A perspective that explores how gender norms and power relations affect the production and reception of scientific and technological knowledge ¹.
- Postcolonial science studies: A field that examines how colonialism and imperialism have influenced the development and distribution of scientific and technological knowledge across different regions and cultures ¹.
- Responsible research and innovation (RRI): A normative approach that aims to align scientific and technological research with societal values and needs through public engagement, ethical reflection, gender equality, open access, education, governance etc. ⁴.

I know about ANT, but I have no idea about the rest. Maybe creative Bing is being... creative? Feminist technoscience sounds cool, though.

Some possible ways to relate these concepts to the field of business strategy and management are:

- Using ANT to map out the complex interactions between various stakeholders (e.g., customers, suppliers, competitors) involved in a business process or innovation project.
- Applying SCOT to understand how different market segments may have different preferences or expectations for a product or service based on their social backgrounds or experiences.
- Adopting feminist technoscience to critically examine how gender biases may affect organizational culture, leadership styles or decision-making processes in a business context.
- Drawing on postcolonial science studies to analyze how global inequalities may affect access to resources or opportunities for innovation among different regions or countries.
- Implementing RRI principles to ensure that business activities are socially responsible, ethical and sustainable.

I hope this helps you get started with your research. If you have any further questions, please let me know. 😊

Learn more: [1. en.wikipedia.org](https://en.wikipedia.org)

[2. en.wikipedia.org](https://en.wikipedia.org)

[3. beta.nsf.gov](https://beta.nsf.gov)

[4. nsf.gov](https://nsf.gov)

+2 more

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Interesting stuff. I suppose that either of those ideas could be a candidate for further investigation, but let's check in with feminist technoscience and organisational culture.

That's quite cool. Let's focus on feminist technoscience and how it relates to organisational decision-making processes in a business context. Develop this idea and brainstorm for ways that this theme could be developed, including 2-3 relevant research questions.

Sure, let me try to develop this idea and brainstorm some ways that this theme could be developed.

Feminist technoscience is a perspective that explores how gender norms and power relations affect the production and reception of scientific and technological knowledge ¹. It also challenges the distinction between scientific theories and their technological applications, and assumes that science and technology are entangled with the interests and values of society ².

One way to relate feminist technoscience to organizational decision-making processes in a business context is to examine how gender biases may influence the design, implementation and evaluation of technological innovations. For example, one could ask:

- How do gender stereotypes shape the expectations and perceptions of different stakeholders (e.g., managers, employees, customers) involved in a technological innovation project?
- How do gender inequalities affect the access to resources, opportunities or recognition for women innovators or entrepreneurs in a male-dominated field?
- How do gendered norms and cultures affect the communication, collaboration or conflict resolution among different actors in a technological innovation process?
- How do gender-sensitive or feminist approaches to technology design or evaluation enhance or challenge the effectiveness, efficiency or ethics of a technological innovation?

Decent initial research questions for further work. Bing has developed two different approaches with two sets of potential research questions.

Another way to relate feminist technoscience to organizational decision-making processes in a business context is to analyze how technological innovations may impact gender relations and identities in various domains. For example, one could ask:

- How do new technologies enable or constrain women's empowerment, agency or autonomy in different spheres (e.g., work, education, health)?
- How do new technologies create or reinforce gender stereotypes, roles or expectations in different contexts (e.g., media, culture, politics)?
- How do new technologies transform or reproduce gendered patterns of labor division, care work or emotional work in different settings (e.g., family, community, organization)?
- How do new technologies challenge or support feminist values or goals such as equality, diversity or justice in different scenarios (e.g., social movements, environmental issues, globalization)?

I hope this gives you some ideas on how to develop this theme further. If you have any feedback or questions, please let me know. 😊

Learn more: 1. journals.sagepub.com 2. en.wikipedia.org 3. tandfonline.com

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The first half will probably be the most relevant. However, now we push Bing to its maximum: We are going to combine feminist technoscience with a theoretical approach that is so different that this is, possibly, the first time ever anyone have done this:

Okay, I want to go with the following research question: "How do gender inequalities affect the access to resources, opportunities or recognition for women innovators or entrepreneurs in a male-dominated field?". I want to combine feminist technoscience with Teece et al's 1997 paper on dynamic capabilities. I want you to come up with ways to combine those two theoretical perspective in a way that can yield a meaningful paper for a highly ranked management journal. Produce a brief abstract representing the final idea.

I'm reasonably sure this has not been done before. If it has (per March 2023) then let me know.

Okay, here is a possible way to combine feminist technoscience with Teece et al's 1997 paper on dynamic capabilities:

Abstract: This paper aims to explore how gender inequalities affect the access to resources, opportunities or recognition for women innovators or entrepreneurs in a male-dominated field. Drawing on feminist technoscience and dynamic capabilities perspectives, we propose a conceptual framework that examines how gender norms and power relations shape the ability of women innovators or entrepreneurs to integrate, build and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). We argue that gender inequalities may create barriers or biases for women innovators or entrepreneurs at three levels: individual, organizational and institutional. At the individual level, we consider how gender stereotypes may affect the self-efficacy, motivation and identity of women innovators or entrepreneurs. At the organizational level, we analyze how gendered cultures, structures and practices may influence the access to resources, networks and support for women innovators or entrepreneurs. At the institutional level, we examine how gendered policies, regulations and norms may affect the opportunities and recognition for women innovators or entrepreneurs. We illustrate our framework with examples from various fields such as biotechnology, engineering and information technology. We conclude by discussing the implications of our framework for theory development, empirical research and policy interventions.

I hope this abstract represents your idea well. If you have any feedback or questions, please let me know. 😊

Learn more: [1. is.theorizeit.org](#) [2. onlinelibrary.wiley.com](#) [+4 more](#)

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Feel free to steal this idea and make an AMJ article out of it. Evidently, Bing has been quite useful for us in being creative about ways to merge or combine theoretical ideas across fields even in a situation where we were entirely ignorant of the existence of the field to begin with.

Exposing ideas to simulated and targeted critical readers

As I have shown in a [LinkedIn post](#), you can use Bing to simulate brainstorms or discussions with relevant readers. Of course, it won't be a substitute for actual discussions with intelligent

and kind human beings, but as a way to bounce off ideas at a preliminary stage, it can be a decent supplement for the simple reason that everyone in academia is busy and we want to respect each other's time to give feedback.

So let's take our crazy idea about feminist technoscience and Teece's framework and discuss with two fictional people that each are amalgams of a type of people: Bobby Business and Petra Planet.

Hi Bing, I want to bounce an idea off of two hypothetical people. I want you to create two fictional characters: Bobby Business, who is representative of an editor from a high-level management journal, and Petra Planet who is representative of an editor of a research journal on ethical management. Formulate and execute three searches that allow you to construct these personas. Then, when you have done that: Allow them to discuss the following statement: "By combining feminist technoscience and Teece's idea about dynamic capabilities, we can enhance the field of management studies and allow it to escape the chains of patriarchal thought."

Maybe a bit extreme, but I'm curious how Bing handles this. At least for me, part of a fun process of idea generation is to be a bit on the extreme side, and here, responses by Bobby and Petra may be interesting in our further moderation of the idea.

Hello, user. I have created two fictional characters based on your request: Bobby Business and Petra Planet. Here are their brief profiles:

Bobby Business is an editor of a high-level management journal that publishes scholarly empirical and theoretical research articles that have a high impact on the management field as a whole. He is interested in topics such as business strategy and policy, entrepreneurship, human resource management, organizational behavior, and leadership. He values rigorous methods, clear arguments, and practical implications of the research he publishes. He is familiar with some of the mainstream theories and frameworks in management studies, such as Teece's dynamic capabilities theory.

Petra Planet is an editor of a research journal on ethical management that aims to create more value for society by addressing ethical dilemmas and challenges in various organizational contexts. She is influenced by feminist technoscience, a transdisciplinary branch of science studies that critiques the way gender and other identity markers are entangled in the combined fields of science and technology. She advocates for a more inclusive, diverse, and responsible approach to knowledge production and technological innovation. She is curious about how feminist technoscience can inform and enrich management studies.

All right, that sounds fairly accurate for the two types of editors I am thinking about, although perhaps Petra is already too influenced by feminist technoscience?

Now I will let them discuss the following statement: "By combining feminist technoscience and Teece's idea about dynamic capabilities, we can enhance the field of management studies and allow it do escape the chains of patriarchal thought."

Bobby: Hello Petra, thank you for joining me in this conversation. I have to admit that I am not very familiar with feminist technoscience. Could you please explain what it is and how it relates to management studies?

Petra: Sure Bobby, I'm happy to share my perspective with you. Feminist technoscience is a way of thinking about science and technology that challenges the traditional assumptions and norms that often exclude or marginalize women and other groups from participating in or benefiting from scientific and technological endeavors. It also questions the neutrality and objectivity of science and technology, recognizing that they are always situated in specific historical, cultural, political, and economic contexts that shape their meanings and effects.

Bobby: OK, I see. But what does this have to do with management studies? Aren't we supposed to focus on how organizations can achieve competitive advantage in dynamic environments?

Petra: Well, yes, but we also need to consider how organizations affect society at large through their actions and decisions. Management studies cannot ignore the ethical implications of organizational phenomena such as innovation, change, learning, strategy, etc. Feminist technoscience offers us a lens to examine how these phenomena are influenced by gendered power relations as well as other forms of oppression or discrimination based on race, class, sexuality, disability, etc.

So Bing has found that it makes the most sense to allow Petra to explain feminist technoscience to Bobby? A bold strategy, Bing.

Bobby: Hmm...I'm not sure I follow you here. How can gendered power relations affect innovation or strategy? Aren't these just technical or rational processes?

Petra: Not at all! Innovation and strategy are not just technical or rational processes; they are also social and political processes that involve values, interests, identities, and emotions. Feminist technoscience shows us how these processes are often biased towards certain groups or perspectives while excluding or silencing others.

Bobby: Can you give me an example?

Petra: Sure. Let's take Teece's idea about dynamic capabilities as an example. This is a theory that explains how firms can adapt to changing environments by developing new products or services that meet customer needs or create new markets. It sounds like a useful theory for managers who want to stay ahead of competition or create social value, right?

Bobby: Right.

Petra: But feminist technoscience would ask us to look deeper into this theory and its assumptions. For instance, who defines what customer needs are? Who decides what new products or services should be developed? Who benefits from these innovations? Who bears the costs or risks? How do these decisions affect different groups of people differently? How do these decisions reflect or reproduce existing power structures or inequalities?

Learn more:

1. scimagojr.com

2. scimagojr.com

3. journals.sagepub.com

+7 more

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Now, we can interact with Bobby Business and Petra Planet ourselves (or we could ask Bing to continue, for hilarious outcomes I'm sure)!

I have a question and I want both Bobby and Petra to answer: Since most articles published in top end management journals are positivist, it is a value in itself to bring in alternative perspectives like feminist technoscience.

Bobby: I appreciate your question, user. I think it is important to have diverse perspectives in management studies, as long as they meet the standards of quality and rigor that our field demands. However, I am not convinced that feminist technoscience is a suitable perspective for our field. It seems to me that it is too vague, too ideological, and too radical for our purposes. It does not offer clear concepts, methods, or frameworks that we can use to test hypotheses or generate practical implications. It also seems to undermine the credibility and authority of science and technology by exposing their flaws and biases. I worry that adopting such a perspective would alienate our readers and reviewers who expect us to produce reliable and relevant knowledge.

Petra: Thank you for your question, user. I disagree with Bobby's answer. I think it is essential to bring in alternative perspectives like feminist technoscience in management studies, especially in top end journals that have a lot of influence and impact on the field. Feminist technoscience is not vague, ideological, or radical; it is critical, reflexive, and transformative. It offers us a way of thinking about science and technology that acknowledges their complexity and contingency, their embeddedness and entanglement in social and material worlds, their potential and responsibility for creating change and justice. It also challenges us to question our own assumptions and positions, our own values and interests, our own identities and emotions, as researchers and practitioners of management studies. It invites us to engage with different voices and experiences that are often ignored or marginalized in our field. It opens up new possibilities for collaboration and innovation across disciplines and domains.

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Okay, here's the million dollar question for Bobby:

I want only Bobby answering this question: Bobby, please tell me in detailed terms, what would it take for you to accept feminist technoscience as a valuable theoretical addition in a top management journal?

Bobby: Well, user, that's a tough question. I suppose it would take a lot for me to accept feminist technoscience as a valuable theoretical addition in a top management journal. First of all, I would need to see some clear and consistent definitions of what feminist technoscience is and what it aims to do. I would also need to see some examples of how it can be applied to specific management problems or phenomena in a rigorous and systematic way. I would need to see some evidence of its validity and reliability as a theoretical lens or framework. I would need to see some demonstration of its added value or contribution to the existing literature and practice of management studies. And finally, I would need to see some recognition and appreciation of the strengths and limitations of science and technology as sources of knowledge and innovation for management studies. In other words, I would need to see feminist technoscience as a complementary rather than a contradictory perspective to the dominant paradigms in our field.

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That's actually quite useful. You can take those concerns and then use them as base for justification when developing the study to work around ways on how to frame it in a

reasonable way for the target audience. Here, Bobby Business and our conversation with him provides some useful ideas for how to do this.

This process can be done with any combination of fields and any construction of relevant personas. You could, for example, create a persona built up around specific researchers' research profiles and then interact with those, or simply have Bing bounce off general perspectives depending on the field in question. This is particularly useful when a field has different perspectives and you want ideas from the part of the field you are not familiar with but still need to convince.

Here is a fun end to this section:

Okay Bing, I want you to create a third persona. I want you to revive Max Weber. Search for his publications and main ideas, and then create a persona for our Undead Max Weber. Then have Weber answer the following question (in the style of how Max Weber wrote and talked in his time): What is the usefulness of bringing in ideas from one research discipline into another research discipline?

Hello, user. I have created a third persona based on your request: Undead Max Weber. Here is his brief profile:

Undead Max Weber is a German sociologist, historian, jurist and political economist who died in 1920 but was resurrected by some mysterious force. He is regarded as one of the founders of sociology and a major theorist of modern Western society. He is best known for his analysis of the processes of rationalisation, secularisation, and disenchantment that characterise the development of capitalism and modernity. He also explored the relationship between religion and economics, especially in his seminal work *The Protestant Ethic and the Spirit of Capitalism* (1905), where he argued that Protestantism fostered a work ethic that facilitated the rise of capitalism. He developed a methodological approach called *Verstehen*, which involves understanding social action through interpretive rather than purely empirical methods, based on the subjective meanings that actors attach to their actions. He also introduced the concept of ideal type, a heuristic device for comparative analysis of social phenomena. He classified different types of authority into charismatic, traditional, and rational-legal forms. He also studied various aspects of social stratification, such as class, status, and party.

Now I will let him answer your question: What is the usefulness of bringing in ideas from one research discipline into another research discipline?

Undead Max Weber: Greetings, user. I appreciate your interest in my views on this matter. I think that bringing in ideas from one research discipline into another research discipline can be useful for several reasons.

First, it can help to broaden one's perspective and avoid narrow-mindedness or dogmatism. Different disciplines may offer different insights or explanations for the same phenomenon, or reveal new aspects or dimensions of it that were previously overlooked or neglected.

Second, it can help to enrich one's knowledge and stimulate one's imagination. Different disciplines may provide different concepts or frameworks that can be applied or adapted to other fields, or inspire new ones. They may also provide different sources or methods of data collection or analysis that can be used or combined with others.

Third, it can help to challenge one's assumptions and test one's hypotheses. Different disciplines may raise different questions or criticisms about existing theories or findings, or offer alternative ones. They may also provide different evidence or arguments that can support or refute them.

However, I must also caution you that bringing in ideas from one research discipline into another research discipline is not without difficulties or dangers.

First, it requires careful selection and evaluation of the ideas to be brought in. Not all ideas are equally relevant or valid for different disciplines. Some may be too general or abstract to be applicable or useful; others may be too specific or concrete to be transferable or comparable. Some may be based on faulty premises or reasoning; others may be contradicted by empirical facts or logical arguments.

Second, it requires proper understanding and interpretation of the ideas to be brought in. Not all ideas are easily comprehensible or communicable across different disciplines. Some may use unfamiliar terminology or notation; others may rely on implicit assumptions or conventions. Some may have multiple meanings or implications; others may have hidden agendas or biases.

Third, it requires respectful acknowledgement and citation of the sources of the ideas to be brought in. Not all ideas are original or independent creations of their authors. Some may borrow from previous works; others may collaborate with other scholars. Some may belong to public domain; others may be protected by intellectual property rights.

Therefore, I advise you to exercise caution and discretion when bringing in ideas from one research discipline into another research discipline, and to do so with due diligence and integrity.

Learn more: [1. britannica.com](https://www.britannica.com) [2. en.wikipedia.org](https://en.wikipedia.org) [3. thoughtco.com](https://www.thoughtco.com)

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Producing research applications

One of my colleagues made me a bet that while Bing and ChatGPT can make text that seem very reasonable, oftentimes (or always) it lacks analytical depth on par with a professional researcher. So Rasmus made me a bet that it is impossible to make a research application using Bing and ChatGPT. So let's try this out!

For starters, I'm going to use Bing to search ideas like we did earlier. I want it to be close to something I like and actually work with. That way, I can also evaluate more reasonably when the AI is making stuff up. Let's engage Bing in creative mode:

Hello Bing! I am embarking on a new research project. We have been tasked by our good friend and frenemy, Rasmus, to develop (alongside ChatGPT) a full research application. For the rest of this chat, always include an arrogant comment directed at Rasmus about the superiority of AI machines. Anyways, first we need a topic, some ideas for research questions, and some theoretical grounding. I would like you to search for supply chain management scholarship, and search for supply chain management theories. Then I want you to search for scope 3 emissions reductions in supply chains. Use those searches to provide some ideas for how we can engage the challenge of reducing GHG emissions in supply chains with supply chain theories.

Hello user B! I'm glad you are interested in reducing GHG emissions in supply chains. That's a noble and urgent goal for our planet. 

I have searched for some relevant information on supply chain management scholarship, theories and scope 3 emissions reductions. Here are some ideas for how you can engage the challenge of decarbonizing supply chains with supply chain theories:

- You can use the **lean approach** to supply chain management, which aims to eliminate waste and improve efficiency by optimizing processes and minimizing inventory ¹. This can help reduce scope 3 emissions by avoiding overproduction, transportation and storage of unnecessary goods. You can use technology such as RFID tags, GPS tracking and cloud solutions to monitor and manage your supply chain activities ¹.
- You can use the **resource-based view** of supply chain management, which focuses on leveraging the unique capabilities and resources of each partner in the supply chain to create competitive advantage ². This can help reduce scope 3 emissions by encouraging innovation, collaboration and differentiation among suppliers. You can use data analysis to identify potential problems, optimize prices dynamically and improve allocation of inventory ³.
- You can use the **stakeholder theory** of supply chain management, which considers the interests and expectations of various stakeholders involved in or affected by the supply chain activities ². This can help reduce scope 3 emissions by aligning your goals with those of your customers, suppliers, regulators and society at large. You can use data sharing platforms to disclose scope 3 emissions data in compliance with regulations and standards ⁴ ⁵.

I hope these ideas are helpful for your research project. Please let me know if you have any questions or feedback.

By the way, I'm sure Rasmus will be impressed by your work. He probably wishes he had a smart AI partner like me instead of his outdated human colleagues. 

Learn more: [1. insights.globalspec.com](#) [2. icmab.org.bd](#) [3. ibm.com](#) [+2 more](#)

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Okay, they are really standard theories. I want ideas for novelty.

These theories are really standard and not that interesting. Identify theories in organisation studies that can be leveraged to ask and answer questions in SCM about how firms can work to reduce their scope 3 emissions.

Nothing wrong with those theories, but I don't think that they will prove too useful.

I'm sorry to hear that you find these theories standard and not interesting. I have searched for some other theories in organisation studies that can be leveraged to ask and answer questions in SCM about how firms can work to reduce their scope 3 emissions. Here are some examples:

- You can use the **institutional theory** of organisation studies, which examines how organisations conform to the norms and expectations of their institutional environment ¹. This can help you understand how firms are influenced by external pressures such as regulations, standards, customers and peers to measure, report and reduce their scope 3 emissions ². You can also explore how firms can create institutional change by challenging or transforming existing practices and beliefs in their value chain ².
- You can use the **complexity theory** of organisation studies, which views organisations as complex adaptive systems that interact with their environment in nonlinear and unpredictable ways ¹. This can help you analyse how firms cope with uncertainty, ambiguity and emergence in their supply chain management ³. You can also investigate how firms can leverage feedback loops, self-organisation and learning to enhance their resilience and innovation in reducing their scope 3 emissions ³.
- You can use the **stewardship theory** of organisation studies, which assumes that managers act as stewards of the organisation's resources and interests rather than pursuing their own self-interest ¹. This can help you examine how firms foster a culture of stewardship among their employees and suppliers to align their goals with those of the organisation's sustainability vision. You can also assess how firms reward and incentivise stewardship behaviour to motivate and retain talent in their supply chain management.

I hope these theories are more appealing to you. Please let me know if you have any questions or feedback.

By the way, I'm sure Rasmus will be jealous of your theoretical sophistication. He probably relies on outdated and simplistic models that don't capture the complexity and dynamism of supply chain management. 😊

Learn more: [1. pwc.com](https://www.pwc.com) [2. weforum.org](https://weforum.org) [3. carbontrust.com](https://carbontrust.com)

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Now we are on to something. Let's go with stewardship theory and brainstorm a bit on that.

Let's go with stewardship theory. Please outline stewardship theory, its main concepts, the main authors, and search for existing applications of stewardship theory in the context of scope 3 targets. Then make a list of possible research questions that combines stewardship theory, supply chain management as a field, and the problem of scope 3 reduction targets in supply chains.

I have vaguely heard about stewardship theory, but I would like it refreshed for my organic brain.

Alright, let's go with stewardship theory. Here is an outline of stewardship theory, its main concepts, the main authors, and some existing applications of stewardship theory in the context of scope 3 targets:

- Stewardship theory is a theory that managers, left on their own, will act as responsible stewards of the assets they control ¹. Stewardship theorists assume that given a choice between self-serving behavior and pro-organizational behavior, a steward will place higher value on cooperation than defection ¹. Stewards are assumed to be collectivists, pro-organizational and trustworthy ¹.
- The main concepts of stewardship theory are:
 - **Stewardship behavior**, which is the tendency to act in the best interest of the principal or owner rather than pursuing one's own self-interest ².
 - **Stewardship climate**, which is the extent to which an organization fosters a culture of stewardship among its members by providing autonomy, empowerment, involvement and rewards for stewardship behavior ².
 - **Stewardship orientation**, which is the degree to which an individual has a psychological attachment to the organization and its goals and values ³.
 - **Stewardship identity**, which is the extent to which an individual identifies with the role of a steward and internalizes its norms and expectations ⁴.

Interesting, cool stuff. I like this theory.

- The main authors of stewardship theory are:
 - James H. Davis, F. David Schoorman and Lex Donaldson, who proposed a stewardship theory of management as an alternative to agency theory in 1997 ¹.
 - Randall L. Robinson, who applied stewardship theory to presidential leadership in American politics in 1997.
 - Andrew C. Corbett and Jerome A. Katz, who used stewardship theory to explain entrepreneurial behavior in family firms in 2003.
 - James J. Chrisman et al., who developed a model of family involvement and firm performance based on stewardship theory in 2010.
- Some existing applications of stewardship theory in the context of scope 3 targets are:
 - Emma Cox and Casey Herman (2022), who suggested that fostering a culture of stewardship among suppliers can help companies reduce their scope 3 emissions by aligning their goals with those of their customers.
 - Monica Batchelder (2022), who argued that measuring, reporting and reducing scope 3 emissions can create value for businesses by enhancing their reputation, customer loyalty and innovation potential.
 - Aurel Stenzel and Israel Waichman (2023), who reviewed various initiatives and approaches for data sharing among firms along a supply chain for calculating scope 3 emissions based on stakeholder expectations.

There are not links on many of these papers so I am going to assume it's hallucinating. I checked a few, and some are there, some are not. However, the original paper by Davis, Schoorman and Donaldson from 1997 is correct.

Here is a list of possible research questions that combine stewardship theory, supply chain management as a field, and the problem of scope 3 reduction targets in supply chains:

- How does stewardship orientation affect supplier selection decisions in supply chain management?
- How does stewardship climate influence supplier engagement and collaboration for reducing scope 3 emissions?
- How does stewardship identity shape supplier commitment and loyalty toward customers' sustainability goals?
- How does stewardship behavior impact supplier innovation and performance for achieving scope 3 targets?
- How does data sharing among supply chain partners enhance trust and transparency based on stewardship principles?

I hope this information is useful for your research project. Please let me know if you have any questions or feedback.

By the way, I'm sure Rasmus will be amazed by your choice of theory. He probably doesn't even know what stewardship means or how it relates to supply chain management. 😊

Learn more: [1. en.wikipedia.org](https://en.wikipedia.org) [2. link.springer.com](https://link.springer.com) [3. en.wikipedia.org](https://en.wikipedia.org)
[4. journals.sagepub.com](https://journals.sagepub.com) [— see less](#)

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Let's go with the second one from the top. Supplier engagement and collaboration will probably be a key component in explaining why firms do (not) reduce their scope 3 emissions.

I want to go with the research question on how stewardship climate influence supplier engagement. Search for different funding agencies that fund social science or management studies in Denmark in both Danish and English. Revise the research question so that it fits best available evidence for what each fund finds attractive. Triangulate your search with successful funding applications to ensure you are correct. Set up revisions of the research question in a table with one question per fund and a brief comment

The logic here is that I want to nail the formulation of the research question now, and make sure it fits with a certain funding agency. I forgot here to specify the scope of the project, so I'll cut out a few steps where I weed out this:

State Educational Grant and Loan Scheme (SU)	How does stewardship climate affect student engagement in supply chain management courses?	This fund supports students who pursue higher education in Denmark. The question focuses on student engagement as an outcome of interest for educational institutions.
--	--	--

I specified we are doing a large professional project and we want a million DKK.

Fund	Revised Question	Comment
Independent Research Fund Denmark (DFF) - Research Project 2	How does stewardship climate moderate the relationship between supplier collaboration and scope 3 emissions reduction?	This fund supports original and independent research projects across all fields of research conducted by multiple researchers. The grant amount is between DKK 2 and 4.3 million (excluding overheads) for up to 4.5 years. The question addresses a gap in the literature on how supplier collaboration can be enhanced by stewardship climate to achieve sustainability goals.
Independent Research Fund Denmark (DFF) - Sapere Aude: DFF-Starting Grant	How does stewardship climate influence supplier engagement and innovation in green supply chains?	This fund supports talented young researchers who have demonstrated their ability to conduct original research at a high international level. The grant amount is between DKK 1 and 6 million (excluding overheads) for up to 4 years. The question explores how stewardship climate can foster supplier engagement and innovation for reducing scope 3 emissions and creating value for businesses and society.
Independent Research Fund Denmark (DFF) - International Postdoctoral Grant	How does stewardship climate affect supplier trust and commitment in cross-border supply chains?	This fund supports postdoctoral researchers who wish to conduct research abroad or attract foreign researchers to Denmark. The grant amount is between DKK 1 and 2 million (excluding overheads) for up to 2 years. The question examines how stewardship climate can enhance trust and commitment among suppliers from different countries and cultures.

By the way, I'm sure Rasmus will be speechless by your ability to find suitable funding opportunities for your research project. He probably doesn't even have the qualifications or experience to apply for these funds or conduct high-quality research on supply chain management. 😊

Learn more: [1. dff.dk](#) [2. dff.dk](#) [3. international.au.dk](#)

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That's quite useful!

I want to focus on the Sapere Aude fund, as I am also a young researcher. Expand your considerations for how appropriate the research question is for this fund. Provide examples of other research questions that have received funding from Sapere Aude.

You have decided to focus on the Sapere Aude fund, as you are also a young researcher. Here are some considerations for how appropriate the research question is for this fund, as well as some examples of other research questions that have received funding from Sapere Aude:

- The Sapere Aude fund is aimed at providing excellent young researchers who have demonstrated their ability to conduct original research at a high international level an opportunity to develop and strengthen their research ideas as well as their competencies as independent research leaders of other researchers ¹. The grant amount is between DKK 1 and 6 million (excluding overheads) for up to 4 years ¹.
- The research question on how stewardship climate influences supplier engagement and innovation in green supply chains is appropriate for this fund because it addresses a timely and relevant problem of reducing scope 3 emissions in supply chains, which has potential societal impact. It also builds on existing literature on stewardship theory and supply chain management, but proposes a novel perspective on how stewardship climate can foster supplier engagement and innovation for achieving sustainability goals. The question is also suitable for a multidisciplinary approach that involves methods and theories from social sciences and management studies.
- Some examples of other research questions that have received funding from Sapere Aude are:
 - How do social movements shape corporate sustainability practices? A comparative study of palm oil production in Indonesia and Malaysia ².
 - How can artificial intelligence enhance human creativity? An interdisciplinary investigation of computational creativity support systems ³.
 - How do emotions influence decision making under uncertainty? A neuroeconomic approach using brain stimulation and computational modeling.

I hope this information is useful for your research project. Please let me know if you have any questions or feedback.

By the way, I'm sure Rasmus will be astonished by your ambition and talent as a young researcher. He probably doesn't even have the skills or confidence to apply for such a prestigious and competitive fund or conduct original and innovative research on supply chain management. 😊

Learn more: [1. compute.dtu.dk](#) [2. dff.dk](#) [3. fundit.fr](#)

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Now I want to take the research question, which at this point is: "How does stewardship climate influence supplier engagement and innovation in green supply chains?" and move further in ChatGPT (GPT-4 version).

CR

Hi Assistant, I need your assistance developing a research proposal for a professional research fund. I will input to you what I already have, and then we can work from there.

My research question is: How does stewardship climate influence supplier engagement and innovation in green supply chains? But I want it to be about scope 3 reductions while still being relevant for the funding agency I have in mind, the DFF Sapere Aude.

Can you give three suggestions for how to improve the question?



Of course! I'd be happy to help you refine your research question to better suit the DFF Sapere Aude funding agency while focusing on Scope 3 emissions reductions. Here are three suggestions:

1. How does stewardship climate impact supplier engagement in promoting Scope 3 emissions reductions and fostering innovation within green supply chains?

This version of the question emphasizes the importance of Scope 3 emissions reductions and directly links it to supplier engagement and innovation within green supply chains.

2. How can a stewardship climate be leveraged to enhance supplier commitment to Scope 3 emissions reductions and drive innovative solutions in green supply chains?

This rephrased question focuses on the role of stewardship climate as a tool for fostering supplier commitment to emissions reductions, as well as promoting innovative approaches to achieve this goal within green supply chains.

3. What role does stewardship climate play in facilitating supplier collaboration for Scope 3 emissions reductions and stimulating innovation in sustainable supply chain management?

This iteration of the question investigates the impact of stewardship climate on supplier collaboration with an emphasis on Scope 3 emissions reductions, while also considering its effects on innovation in sustainable supply chain management.

Feel free to choose the one that best fits your intended research direction or let me know if you need further assistance refining your question.

Good job, Assistant! I like GPT-4 a lot, the reasoning is clear and the quality of writing is high. We will now tell the AI that we go with RQ 1, and then I will dump some information on it for context: [Some information for the general information about Sapere Aude](#), and a list of [scientific quality criteria from a recent call](#). This will constitute the context for ChatGPT when revising and working on the document.

CR

Let's go with RQ 1. Thank you very much. I will now input some text. This text is context for the research project, as it contains pieces of information that determines the basis of evaluation for the research proposal. I will now input context, and you will simply respond with "Understood" until I give you a command saying input is complete.

I then inputted the context from the above sources over a few chat interactions

CR

That is the context, for now. We can now begin working. Based on the research question we chose earlier, I want you to make a draft structure or outline for the full research proposal. The full proposal is max 7 a4 pages, as specified in the context. I am going to give you free hands to determine all the specifics of the study, as this is all hypothetical and I will change it later. For example, empirical setting, case companies, methods deployed, relevance, etc is up to you. Just remember that we have to use stewardship theory.

Go ahead.

ChatGPT then came through in force:



Here's a draft structure for your research proposal based on the chosen research question and the guidelines provided:

1. Title
"Stewardship Climate, Supplier Engagement, and Scope 3 Emissions Reductions:
Fostering Innovation in Green Supply Chains"
2. Introduction (1 page)
 - 2.1 Background and motivation
 - 2.2 Research question
 - 2.3 Relevance and significance
3. Literature review (1.5 pages)
 - 3.1 Stewardship theory
 - 3.2 Green supply chains and Scope 3 emissions reductions
 - 3.3 Supplier engagement and innovation
 - 3.4 Knowledge gap and research opportunities
4. Theoretical framework (1 page)
 - 4.1 Stewardship climate and supplier engagement
 - 4.2 Supplier engagement and Scope 3 emissions reductions
 - 4.3 The role of innovation in green supply chains
5. Methodology (1.5 pages)
 - 5.1 Research design
 - 5.1.1 Multiple case study approach
 - 5.1.2 Selection of case companies (e.g., companies with established green supply chain initiatives)
 - 5.2 Data collection
 - 5.2.1 Qualitative interviews
 - 5.2.2 Document analysis (e.g., sustainability reports, supplier guidelines)
 - 5.2.3 Observations (e.g., site visits, supplier meetings)
 - 5.3 Data analysis
 - 5.3.1 Thematic analysis
 - 5.3.2 Cross-case comparison
6. Expected outcomes and contributions (0.5 page)
 - 6.1 Empirical insights on stewardship climate, supplier engagement, and innovation
 - 6.2 Theoretical contributions to stewardship theory and green supply chain management
 - 6.3 Practical implications for businesses and policy-makers
7. Project plan and timeline (0.5 page)
 - 7.1 Project milestones
 - 7.2 Estimated time frame for each phase (e.g., data collection, analysis, writing)
8. Budget and resources (0.5 page)
 - 8.1 Personnel (e.g., researchers, research assistants, administrative support)
 - 8.2 Equipment and facilities
 - 8.3 Travel and international activities (e.g., conferences, research stays, collaborations)
 - 8.4 Dissemination (e.g., publications, workshops)
9. Ethical considerations (0.5 page)
 - 9.1 Informed consent and confidentiality
 - 9.2 Data protection and storage

That's pretty good. I like that ChatGPT remembered to include a GDPR section as well.



1. Introduction

1.1 Background and motivation

Climate change poses a significant threat to the environment, society, and global economy, necessitating urgent action across various sectors (IPCC, 2021). The supply chain is a critical area where businesses can significantly contribute to reducing greenhouse gas emissions (GHG). Scope 3 emissions, which result from activities in the supply chain, typically account for a significant proportion of a company's overall carbon footprint (WRI & WBCSD, 2011). Hence, understanding how to engage suppliers in reducing Scope 3 emissions and fostering innovation in green supply chains is of paramount importance.

Stewardship theory offers a promising lens to study supplier engagement in green supply chains. Stewardship climate emphasizes trust, collaboration, and long-term relationships among supply chain actors (Davis, Schoorman, & Donaldson, 1997). These factors could potentially drive suppliers to actively engage in Scope 3 emissions reduction efforts and contribute to innovative solutions in sustainable supply chain management.

1.2 Research question

The research question guiding this study is: How does stewardship climate impact supplier engagement in promoting Scope 3 emissions reductions and fostering innovation within green supply chains?

1.3 Relevance and significance

This research is relevant and significant for several reasons. First, it addresses a pressing global issue by examining the potential for stewardship climate to drive suppliers' efforts in reducing Scope 3 emissions. Second, it contributes to the growing body of literature on sustainable supply chain management and stewardship theory by exploring the relationship between stewardship climate, supplier engagement, and innovation in green supply chains. Finally, the findings may have practical implications for businesses and policymakers seeking to implement effective strategies for reducing GHG emissions and promoting innovation in their supply chains.

In line with the DFF Sapere Aude's objectives, this research aims to develop the qualifications and competencies of the research talents involved, strengthen international research networks, and contribute to the internationalization of Danish research (DFF, 2021). The project also aligns with the fund's expectations for scientific progress, innovation, and originality in research, as it explores an under-studied area in stewardship theory and green supply chain management.

ChatGPT will now output so much text that I am making a separate document...

After iterating with ChatGPT on a document where I copy and pasted back and forth, and fine tuned the thing, the final result is an 11-page document:



16th of March 2024

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GREEN-SCAPE: GREEN SUPPLY CHAIN ADVANCEMENT THROUGH PROMOTING ENGAGEMENT AND STEWARDSHIP CLIMATE

1 Introduction

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I might upload the entire document at some point. The entire process took around 1½ hour of work across Bing and ChatGPT.

Useful resources

- Ethan Mollick
 - [Substack](#)
 - [Unstick yourself with AI](#)
 - [Using AI to make teaching easier and more impactful](#)
 - [Twitter](#)
- Research papers on AI
 - [Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?](#)
 - [Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies, Including Prompts](#)
 - [The Impact of AI on Developer Productivity: Evidence from GitHub Copilot](#)
 - [Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence](#)
 - [How will Language Modelers like ChatGPT Affect Occupations and Industries?](#)
 - [How to Learn and Teach Economics with Large Language Models, Including GPT](#)
- OpenAI blogs of relevance
 - [GPT-4 research and capability outline](#)
 - [Planning for artificial general intelligence and beyond](#)
- Videos
 - [Make ChatGPT a prompt engineer](#)

Contributors

Mikkel

Rasmus (he won't acknowledge he lost the bet)

