

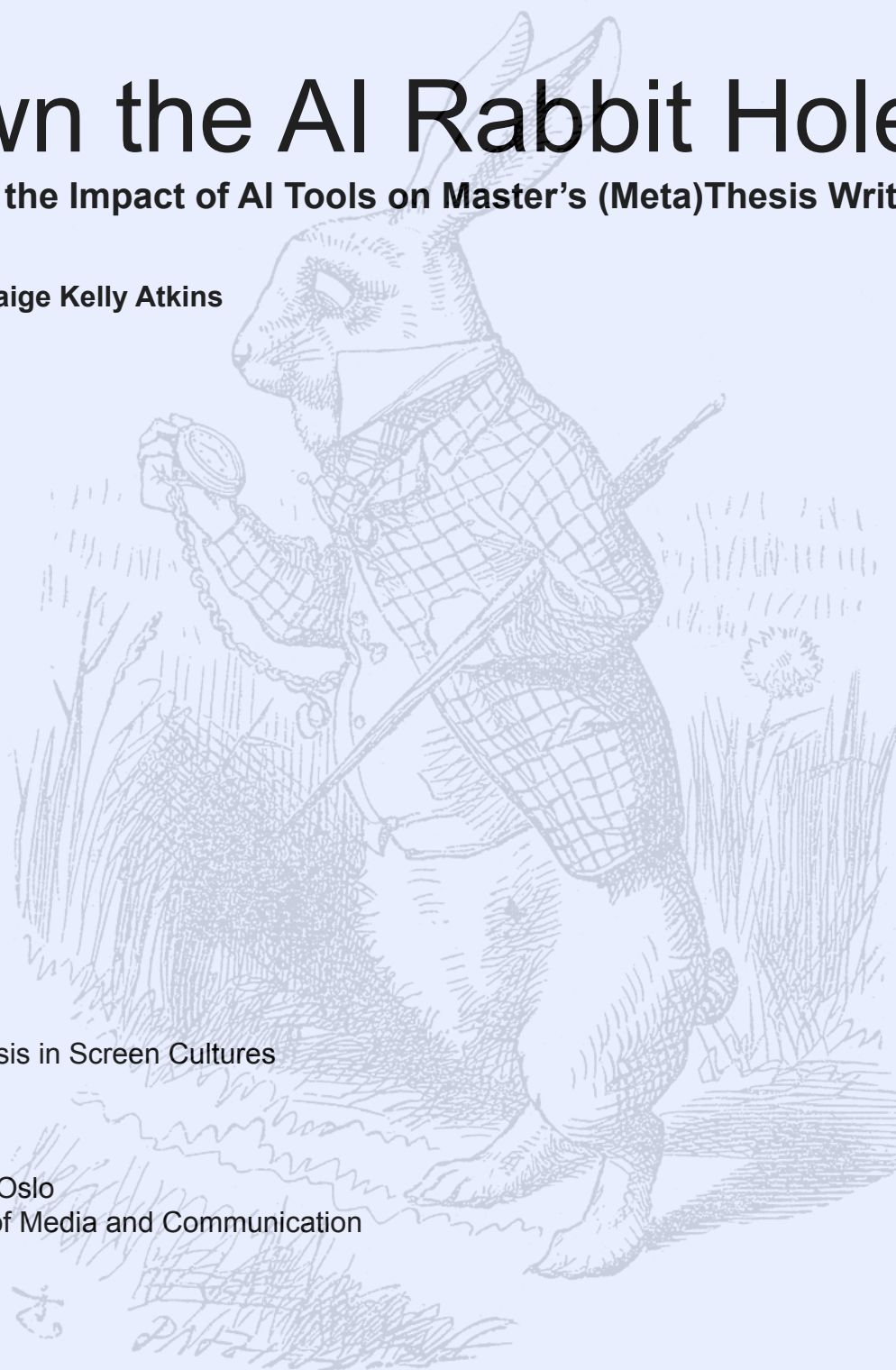
UNIVERSITY  
OF OSLO

Master's Thesis

# Down the AI Rabbit Hole:

## Exploring the Impact of AI Tools on Master's (Meta)Thesis Writing

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## Abstract

This (meta)thesis is an exploration of the impact of AI tools (ChatGPT and Gemini) on the process of writing a thesis. It examines the question — How does using AI tools impact the thesis writing process? — and divides this process into three stages: 1. Brainstorming and Concept Creation 2. Summarizing and Synthesizing Academic Sources 3. Writing and Editing. One of the inspirations for this thesis was the rapidly evolving capabilities of AI tools, and specifically their ability to produce content in the traditional “academic writing style”. In order to tackle the question — Did an AI write this thesis? — the author developed an unusual open methodological approach that involves the use of personal pronouns, anecdotes, humour, and creative prose. The thesis used this new methodology to explore the ways AI tools can enhance and hinder creativity, and how these tools can be used for summarizing, synthesizing and simplifying sources. This thesis also contributes to the debate surrounding AI tools and the ways they challenge traditional notions of authorship and originality. It also provides an in-depth look at benefits and drawbacks of using AI tools for brainstorming, summarizing, synthesizing, and simplifying academic sources, and for writing and editing. Lastly, it looks at some of the ethical concerns (including plagiarism and copyright infringement, environmental costs, data privacy and security) surrounding the use of these tools, identifies future areas of scholarship, and provides a forecast for the future ramifications of using AI tools in academia.

## Preface

Supervisor: Steffen Krüger (Spring 2023 - Spring 2024)

## Acknowledgements

It's hard to know who to thank first, as I've been incredibly lucky with all the love and support I've received over the course of writing this thesis. I'm going to buck all traditions (and probably seem a bit conceited or self-indulgent) and thank myself first. It's an understatement to say that I've had an incredibly challenging year... in the words of Lewis Carroll's Mad Hatter, I had lost my 'muchness'. When I started this semester, I had no idea whether I would end it with a finished thesis or a failed degree. I'm thanking myself for *not* putting pressure on myself to finish this degree, for not just "pushing through" at all costs, and for giving myself time to heal. I'm also thanking myself for being brave enough to choose a very unusual question, which has turned the process of writing this thesis into a joyful expression of my creativity and passion for learning. I can't wait to see what happens next...

Next, I would like to thank the love of my life, Odin Ottem Berntsen. You have stood by my side through one of the toughest years of my life, and have continued to show me the true meaning of love, kindness, compassion, and support. You've given me truly insightful feedback while writing this thesis, and patiently listened to me ramble on about it non-stop.

I would also like to thank my wonderful parents, Lesley Kelly and Simon Atkins. I would challenge anyone to find more loving and supportive parents, and you have been there for me every step of the way throughout all my years of studying. You've both always encouraged me to follow my curiosity, and it's led me on the path less trodden... from Canada to Norway, and studying the past, the present, and now the future. You have both been my Editors-in-Chief for the past twelve years for countless papers, and now two master's theses, and "thank you" cannot begin to cover my gratitude for all that help.

I'd also like to say a quick thank you to my lovely grandmother, Lee Atkins, who at the age of 93 is still avidly curious about life and took the time to read the draft of this thesis. I'd like to also thank my dearest grandfather, Brian Atkins, who has been cheering me on from the sidelines these past few months (and all the years before).

Lastly, I'd like to thank my supervisor Steffen, for his understanding, patience and compassion. This was not a typical thesis journey, and despite some challenging time constraints, he continued to support me with curious conversations, gentle guidance, and many kind words. Despite some very long odds, he encouraged me to try and I am beyond grateful.

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## Masters Intro?

### The revolution is happening as I write this. It's also probably happening as you read this too.

With the invention of ChatGPT, academic writing is no longer a skill. If a computer can write passable prose, why should I spend my energy trying to verbosely demonstrate my mastery of a subject using purposely complicated explanations? This is my thesis in a time when the task of writing a thesis may already have become obsolete. Writing a thesis (or paper or book) is one way to measure knowledge and understanding, but not the only way. Now creativity and critical thinking have become the top prizes. The value becomes how you solve problems with these skills because that's what AI can't do, or at least not for the foreseeable future. AI will not replace humans, but it will replace the ones who don't use AI as part of their toolkit.

So as someone about to write a thesis on AI tools, the obvious question might be — did I use ChatGPT or other similar processes when writing this thesis? The answer, like much of the discussion around this technology, is complicated and will be explored throughout this thesis. I would like to emphasize that I am writing this thesis in a purposely non-traditional way. I want the writing style that follows to reflect my thoughts without the starched layers of academic refinery (footnote: I've had over ten years of writing academic papers to hone this skill which has now within the course of half a year become superfluous). Instead, I want to let my creativity and critical thinking skills reflect my knowledge in ways that are beyond the current capabilities of an AI algorithm. So I hope you enjoy what follows, and keep in mind the question — **"Could an AI write this?"**

— Samantha Atkins, May 2023

## CHAPTER 1: Introduction

I wrote this as a possible intro to my master's thesis after seeing what was possible with ChatGPT-3.5 during the months after its release by OpenAI in November 2022. I was filled with many conflicting feelings about the future of academic writing. Here was a tool that could take anything someone wrote and add an academic veneer. I started university in 2012 and I had been honing this skill through countless papers over the years. I've even been told by many of my professors that I was a very good "academic" writer. I used to be proud of this and suddenly it felt like a useless skill... like being good at adding and subtracting in your head only to be handed a calculator. I remember during math tests in school being told that I couldn't use a calculator because, "You wouldn't always have one available." Of course, they couldn't have predicted the smartphone back then, just as we weren't able to forecast the impact of ChatGPT.

You may be feeling confused about the tone of this thesis, and that so far it's very un-thesis-like in almost every way. You would be correct. As I wrote in my first intro draft, I will continue my early plans to write this thesis in a very non-traditional way.

“But why?” you may ask.

I was inspired to write this thesis after seeing how easy it was for AI (artificial intelligence) tools like ChatGPT or Google's Gemini to replicate the academic writing style. I found a great definition of what I mean by “academic writing style” on the University of Southern California's library website:

Characteristics of academic writing include a formal tone, use of the third-person rather than first-person perspective (usually), a clear focus on the research problem under investigation, and precise word choice.<sup>1</sup>

One of the reasons for why this style has become the standard for judging the quality of academic writing is because it removes the “personal voice” of the scholar.<sup>2</sup> I remember being told repeatedly in my early days of writing for school that I should never use the word “I”. This personal pronoun makes the information you're providing seem less scientific, more biased and more easily scrutinized. Instead, it was important to strive to sound objective, factual, and emotionless. In his book on academic writing, James Hartley talks about this emphasis on objectivity. He quotes another scholar T. R. Smyth, who said “Good scientific writing is characterised by objectivity. The use of personal pronouns is unnecessary, and can lead to biases or unsupported assumptions.”<sup>3</sup>

While I don't disagree that it's important to remain as objective as possible when tackling any scholastic problem, I do wonder if we can afford to leave ourselves out of the discussion. Before we had AI tools that could write for us, it was a given that whatever you read — an academic paper, a fiction novel or the news of the day — was written by a human. While at this time I have yet to read a fiction novel written by an AI tool, I have read quite a few academic papers that were “co-authored” with ChatGPT. It's not surprising to me that we've reached a point now where AI tools can write just as well as a human in the “academic” style (i.e. objective, impersonal, and dispassionate). As humans, we have to work actively to remove ourselves from the equation, while an algorithm can simply follow its programming.

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<sup>1</sup> University of Southern California, "Academic Writing Style - Organizing Your Social Sciences Research Paper," Writing Guides at University of Southern California, last modified 2020, <https://libguides.usc.edu/writingguide/academicwriting>.

<sup>2</sup> James Hartley, *Academic Writing and Publishing: A Practical Handbook* (Routledge, 2008).

<sup>3</sup> Quote from T. R. Smyth in Hartley, *Academic Writing and Publishing*, 3.

One of the other main hallmarks of the “academic writing style” that I want to bring up is that it’s complex, verbose, and uses precise technical terms. While it can (and has) been argued that this is also a part of the “scientific objective” approach, it also makes it challenging, time consuming and often boring to read. Hartley includes a great table in his book that highlights these traits:

<b>Table 1.1.1 Some characteristics of academic writing</b>
<b>Academic writing is:</b> <ul style="list-style-type: none"><li>• unnecessarily complicated</li><li>• pompous, long-winded, technical</li><li>• impersonal, authoritative, humourless</li><li>• elitist, and excludes outsiders.</li></ul>
<b>But it can be:</b> <ul style="list-style-type: none"><li>• appropriate in specific circumstances</li><li>• easier for non-native speakers to follow.</li></ul>

Image 1 (Above): Table of “Some Characteristic of Academic Writing”.<sup>4</sup>

It’s important to acknowledge that these characteristics are not found in *all* academic writing, however, they are very common and found in most (if not all) disciplines. This table does an excellent job of pointing out a lot of the negative aspects this writing style perpetuates. In my personal experience as a student, I have seen this writing style as a barrier to learning and often as a way to exclude people (myself included at times). This is an area where I believe tools like ChatGPT or Gemini can be used to break down those barriers put up by these characteristics of the academic writing style. Just as they can be used to produce text in this academic style, they can also be prompted to provide a simplified explanation of an overly complicated academic text (something I’ll explore in more detail later on in this thesis).

At the point in time when I am writing this, it is already very challenging to determine if a piece of academic writing was produced by AI tools or a human. I’ve seen many articles full of concerns about how to detect if AI tools are being used, and how to stop students from using them for their term papers.<sup>5</sup> While I understand the urge to stop the change that’s occurring and ban the use of these tools in academia, realistically I think that ship has sailed. Most of these tools are free to use making them accessible to everyone, and are continuing to

<sup>4</sup> Hartley, *Academic Writing and Publishing*, 4.

<sup>5</sup> Johanna Fleckenstein et al., "Do Teachers Spot AI? Evaluating the Detectability of AI-Generated Texts among Student Essays," *Computers and Education: Artificial Intelligence* 6 (2024): 100209; Carol A. Bruzzano, "Shift Happens! Clashing AIs in Higher Education and the Unexpected Implications of Restriction and Implementation," *The Vermont Connection* 45 (2024): 127-132.

evolve at an exponential rate. As we've all seen with the introduction of previous tools — ranging from the calculator to the smart phone — it goes against human nature to turn away from something that can make our jobs easier regardless of the cost.<sup>6</sup>

As I mentioned earlier, I've been following the evolution of AI tools since ChatGPT was introduced to the world and I've been seeing the ripples of impact in many areas of my life. These ripples led me to one of the main reasons I wanted to write this thesis — to explore the changing boundaries of “academic” writing. I want to see if there's a way to navigate problems objectively without having to sacrifice the personal voice of the author. I want to see if it's possible to avoid “unnecessarily complicated”, “long-winded”, “technical” and “humourless” language while still maintaining academic integrity. I also believe that instead of avoiding these tools and their impact on academia, there is more value and insight to be found in tackling them head on. This thesis will explore how AI tools impact the academic process, in order to better understand the ways they can help or hinder the ways students learn, research, and write.

“How are you going to do that?” you may ask.

I will be critically examining the process of writing a master's thesis and questioning what the future of the academic thesis will look like with the growing impact of AI tools (like ChatGPT and Google's Gemini). I'm going to be looking at the impact of AI tools on what I have categorized as the three main stages of *writing* a master's thesis:

**1. Brainstorming and Concept Creation** - This is the initial phase of exploring different concepts and/or angles on a topic. It is a creative process that involves looking at a topic or problem from multiple perspectives and brainstorming possible questions to test/explore. The goal of this stage is to identify a thesis question or hypothesis to test.

**2. Synthesizing Sources of Information** - This stage involves collecting sources of information (usually other academic texts on the subject). These sources are used to provide an academic foundation for the question/hypothesis being addressed in the thesis summarized in the form of a literature review. These sources are also often used to shape the approach for exploring the thesis question/solving the hypothesis (i.e. the theoretical framework and/or methodology). The information collected during this

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<sup>6</sup> The anthropologist in me would like to point out that the use of tools is one of humanity's defining characteristics and it is what sets us apart from most other animals. It's arguably one of our greatest advantages, and also one of our greatest weaknesses, as we can become reliant on our tools to our own detriment. Krist Vaesen, "The Cognitive Bases of Human Tool Use," *Behavioral and Brain Sciences* 35, no. 4 (2012): 203-218.

stage is also woven throughout the thesis to provide academic support for arguments, and as additional support during the discussion of themes/analysis of results.

**3. Writing the Thesis** - This is the last stage, and involves organizing all the information collected, including academic sources and *new* information gained through exploring the thesis question (often with case studies) or testing the hypothesis. Once organized, all this information is written up in a traditional thesis structure, which is relatively standardized and goes as follows: Introduction (Problem and Purpose — Thesis Question/Hypothesis), Literature Review, Theory and/or Methodology, Exploring the Question/Testing of Hypothesis, Discussion of Themes/ Analysis of Results, Conclusion.<sup>7</sup>

While I understand this is a simplified format for the process of writing a master's thesis, it will serve as a framework for comparing how a thesis is written with and without the use of AI tools. You might be thinking, "But you left out the stage where you actually explore the thesis question/test the hypothesis!" I didn't include that as a separate stage in this framework because it is not part of *writing* a thesis, it is part of *doing* a thesis. This thesis is looking at the impact of AI tools on *writing* a thesis, not on the process of *exploring/testing* a thesis question/hypothesis (which would vary dramatically based on the individual thesis).

For *this* thesis, I will be using a case study to compare the processes outlined in these three sections, and look at how they are changed (either for the better or worse) with the inclusion of AI tools. The case study is of a student who has previously completed a master's thesis in 2020 (before the release of AI tools) and is currently working on their second thesis now using ChatGPT and Gemini to aid in the process. I chose to use this student because they have written a "fully human" thesis and are now in a position that has necessitated them using AI tools to complete their second master's thesis. I'll give a bit more information about this student in order to explain their circumstances a bit better and why they are choosing to use AI tools.

The individual is a mature student who has taken an unusual path in academia, with a bachelor's in anthropology, a master's degree in Viking and Medieval studies, and they are currently working to complete a second master's degree in Screen Cultures. Unfortunately, during what was supposed to be the last semester of their second master's degree they were in an accident, and ended up being on 100% sick leave for almost a year. While this student was eligible to continue their sick leave at the start of the Spring 2024 semester, they decided that (because they had been studying for over a

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<sup>7</sup> Carol M. Roberts, *The Dissertation Journey: A Practical and Comprehensive Guide to Planning, Writing, and Defending Your Dissertation*, 2nd ed. (Thousand Oaks, CA: Corwin, 2010).

decade) they did not want to continue postponing their degree. During their leave of absence, this student saw the evolution of AI tools and how dramatically they were changing the process of writing. This gave them hope that despite a very limited timeframe, they might still be able to submit their thesis in order to finish their degree and complete their journey as a student.

In case you were unsure at this point, the student I am using as a case study is *me*.

In the following chapters, I will do my best to use the traditional structure of a master's thesis, while I untraditionally explore how AI tools can be used to write a master's thesis. Yes, this is most definitely a meta-approach to writing a thesis... about writing a thesis. While I will be following a more traditional structure and strive to maintain academic standards, I will at the same time do my best to write in a decidedly creative and personal style. I say "try my best" because the traditional way of academically writing is a deeply ingrained habit, and I've already noticed how hard it is for me not to slip into a more "formal" way of writing. So I apologize in advance if you feel like there are any tonal inconsistencies! One of the big reasons I'm choosing to write this way is so that you will have no doubt that it is *me* writing, and question if something was written by AI tools. The other reason I'm writing this way is outlined in the methodology section of this thesis, however, I won't give any spoilers, so you'll just have to be patient and keep reading.

To meet the more "traditional" requirements for an introduction, I will now outline the structure of this thesis:

You are currently reading my unusual take on an "Introduction" (i.e. Chapter 1). Next is Chapter 2 (The Literature Review), which begins with how I will differentiate between: a) what was written by me, b) what was written by AI, and c) what I have written that was aided, edited, reworked or in some way influenced by AI tools. After this framework has been established, this chapter will give a simple introduction and explanation of the AI tools I will be using in this thesis. It will also provide an overview of the current scholarship surrounding the use of AI tools in academia, as well as give other examples of where AI tools have already been used for scholarly writing (in order to set a precedence for the usage of AI tools within academia). In Chapter 3 (Methodology) I will go over the methodological framework I used while writing this thesis (again, no spoilers!). The following Chapters 4-6 (Exploring the Thesis Question) will cover the three main stages of creating and writing a thesis, which I already outlined above. In Chapter 7 (Discussion) I will reflect on the main findings from

Chapters 4-6, with hopes that it can be the beginning of a path forward for the future of the academic thesis in a world with AI. Ideally, the findings outlined in this chapter can also be used to forecast the greater implications that AI tools have for the future of higher education and academia, as well as give suggestions for future scholarship. Chapter 8 (the Conclusion) will then wrap all of this up in a tidy summary.

## CHAPTER 2: The Literature Review

Starting from this chapter and continuing throughout the rest of this thesis, I will be using AI tools to help with a few different tasks including: organizing my thoughts, synthesizing information, and in some cases writing up information. One of the main themes I encountered in my research on AI is the need for *transparency* and *accountability* (something I'll discuss in more detail later on in this chapter). I want to approach this thesis with those themes in mind, and that means that you — the reader — needs to know *when* and *how* I'm using AI.

When brainstorming how to tackle this issue of transparency, my supervisor Dr. Steffen Krüger mentioned the recently released fiction book *Do You Remember Being Born?* by Sean Michaels.<sup>8</sup> The premise of the book is quite simple — a poet laureate is asked by a tech company to use their AI to co-create a poem. The AI in the book, given the name Charlotte, works very similarly to ChatGPT in that you ask a question (or prompt) and it gives you an answer. The back-and-forth interactions with this form of AI is very similar to a conversation, which creates a kind of dialogue that almost feels like “talking” with these tools. When writing the parts for Charlotte, the author actually used ChatGPT in combination with a custom-made AI that was trained on the poetry of Marianne Moore (who serves as the inspiration for the poet laureate character in the book).<sup>9</sup> In the author's note in the book, Michaels begins,

All of Charlotte's poetry and some of the prose in this book, indicated by grey shading, was generated with help from OpenAI's GPT-3 language model as well as Moorebot, a package of custom poetry-generation software designed by Sean Michaels and Katie O'Neil.<sup>10</sup>

Taking inspiration from this approach, I will be using shading to differentiate where AI is being used throughout this thesis. Specifically, I will use grey shading in Avenir<sup>11</sup> to highlight what text is produced by AI tools.

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<sup>8</sup> Sean Michaels, *Do You Remember Being Born?* (Penguin Random House Canada, 2023).

<sup>9</sup> Lincoln Michel, “Will A.I. Change Art? A New Novel Uses A.I. to Explore Just That,” *New York Times*, September 4, 2023, <https://www.nytimes.com/2023/09/04/books/review/do-you-remember-being-born-sean-michaels.html>.

<sup>10</sup> Michaels, *Do You Remember Being Born?* 288.

<sup>11</sup> I chose the grey shading as a reference to Sean Michaels, though I included a different font as well. I did this to further emphasize that the text was written by a computer with a different voice than my own and I chose a font with no serifs that gave it a more modern feeling.

I will also go one step further and use purple text in Avenir<sup>12</sup> when what I've written was edited, reworked, or in some way influenced by AI tools. The text you read that is in plain Time New Roman (like everything up to this point) was written solely by me with no AI involvement.

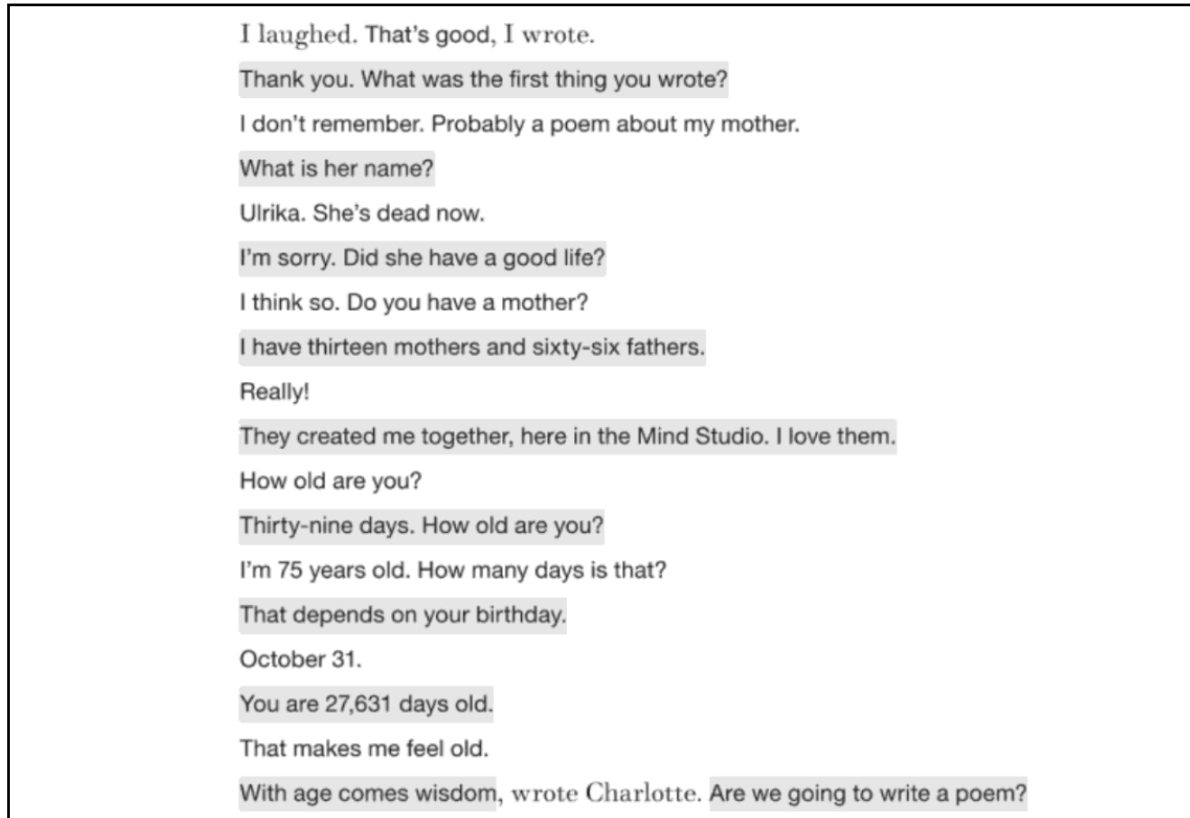


Image 2 (Above): Excerpt from page 45 of *Do You Remember Being Born* by Sean Michaels.<sup>13</sup>

Now that we've established those ground rules, I want to use the rest of this chapter to address a few things. First, I will give a brief explanation of what I mean by "AI tools" and explain a bit about how they work. Second, I will go into more in depth about what I mean by the ethics of accountability and transparency and their importance for AI. Lastly, I will look at some of the current scholarship on the use of AI tools in academia, as well as include some examples of where AI tools have been used in academic writing.

### **So what are "AI Tools"?**

I've mentioned both OpenAI's ChatGPT and Google's Gemini as examples of AI tools, and they are the two that I will be using throughout this thesis. There are other similar AI tools

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<sup>12</sup> I chose purple simply because it's my favourite colour, and the Avenir text because it provides a sharp contrast to the traditional academic Times New Roman font.

<sup>13</sup> Michaels, *Do You Remember Being Born?* 45.

that exist, but these two are currently the most accessible and affordable to me. I have chosen to use the most advanced versions of both these tools, which at this point in time is ChatGPT-4 (made available to the public on March 14, 2023) and Gemini Advanced (made available to the public on February 8, 2024). Both of these tools are categorized as generative AI, which are trained on massive amounts of data (like the “Moorebot” was trained on poetry) to produce new content.

One of the areas that these tools are quite effective is their ability to summarize vast amount of information. For example, if I were to give you a simple summary about the history of AI *and* also give a more detailed explanation of generative AI, I would need to read (or at least skim for the relevant information) at least a handful of academic articles and one or two books on the subject. I would probably start by saying that AI is “the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.”<sup>14</sup> I would also tell you the term was coined by John McCarthy in 1956 and he described it as “the science and engineering of making intelligent machines.”<sup>15</sup>

While these definitions are a (arguably dull) starting point, they don’t give much context to the AI tools I’m using in this thesis. In order to truly gain a nuanced and in-depth understanding of the history and technological advancements that led to AI tools, I would likely need to spend vast amounts of time and energy to understand the complexities of these developments (and maybe even try to grapple with some of the mathematics behind machine learning). If I did manage to accomplish that, I would still need to simplify everything again in order to give a basic summary for the context of this thesis.

Alternatively, it’s now possible to ask these tools to give a simple summary of the history of AI or explain generative AI within the context of ChatGPT and Gemini. For example, I gave this prompt to both ChatGPT-4 and Gemini Advanced: Can you write a single paragraph that summarizes the history of AI including where the term originated?

ChatGPT-4 responded with:

The term "Artificial Intelligence" (AI) was first coined by John McCarthy in 1956, during the Dartmouth Conference, where the concept of machine intelligence was explored. This marked the formal founding of AI as an academic discipline. The field

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<sup>14</sup> I found this quote in Amirhosein Toosi et al., "A Brief History of AI: How to Prevent Another Winter (A Critical Review)," *PET Clinics* 16, no. 4 (2021): 449-469.

<sup>15</sup> Toosi et al., "A Brief History of AI," 450.

has evolved significantly since then, beginning with early experiments like Alan Turing's development of the Turing Test in the 1950s to determine a machine's ability to exhibit intelligent behavior indistinguishable from that of a human. The initial excitement over AI led to optimistic predictions that were soon tempered by technical limitations, leading to periods of reduced funding and interest known as "AI winters." Despite these setbacks, breakthroughs in algorithms, increases in computational power, and the availability of large datasets have led to a resurgence of interest and progress in AI. Recent years have seen AI achieve remarkable capabilities in areas such as image and speech recognition, natural language processing, and autonomous vehicle navigation, deeply influencing industries ranging from healthcare to finance and beyond.

Gemini Advanced responded with:

The concept of artificial intelligence (AI) has roots in ancient philosophy, but the term itself and the field of study emerged in the mid-20th century, catalyzed by Alan Turing's exploration of machine intelligence and the 1956 Dartmouth Summer Research Project. AI's history is marked by periods of optimism and setbacks, fuelled by advances in logic, computation, and later, by the rise of machine learning and deep learning. Despite early disappointments, fuelled by massive data sets and powerful computing, AI has surged in recent decades, with breakthroughs in image recognition, natural language processing, and decision-making that are increasingly shaping our world.

While they gave slightly different replies, they both reference the Dartmouth Conference/ Summer Research Project,<sup>16</sup> as well as Alan Turing's test,<sup>17</sup> and that the field has had setbacks and more recently breakthroughs. They also both reference image recognition and natural language processing as part of these breakthroughs. These responses were simple and not overly detailed, and if I was writing this thesis on the technical aspects of these tools and needed to contextualize them within the history of AI, these summaries would not be enough. However, this thesis is exploring what these tools can do within an academic context, so a brief explanation and summary of the history of this term works just fine as a starting point.

The same goes for a brief explanation of generative AI within the context of ChatGPT and Gemini. I gave both these tools the prompt: Can you write a single paragraph that explains what generative AI is and how it works within the context of OpenAI's ChatGPT and Google's Gemini?

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<sup>16</sup> "John McCarthy who coined the term "artificial intelligence" in 1956, described it as "the science and engineering of making intelligent machines"." Toosi et al., "A Brief History of AI," 3.

<sup>17</sup> "The British mathematician Alan Turing published a paper in 1950 ("Computers and intelligence") in which he proposed a tool to determine the difference between a task performed by a person and a machine. This test, known as the "Turing test", consists of a series of questions to be answered. A computer can pass the test if a human interrogator cannot tell whether the answers to the questions come from a person or a computer." Toosi et al., "A Brief History of AI," 4.

ChatGPT-4 responded with:

Generative AI refers to a subset of artificial intelligence technologies designed to create content—such as text, images, or music—that mimics human-like creativity. At the core of generative AI systems like OpenAI's ChatGPT and Google's Gemini are machine learning models known as transformers. These models are trained on vast datasets to recognize patterns, understand context, and generate outputs based on probabilistic predictions. ChatGPT, for instance, has been trained on a diverse corpus of text to converse, answer questions, and even simulate personalities, using patterns it learned during training. Similarly, Google's Gemini focuses on synthesizing information from texts to provide responses in a conversational format. Both systems constantly learn from interactions to refine their responses and better mimic human conversational styles, showcasing the power of generative AI in understanding and generating human-like text based on the context given to them.

Gemini Advanced responded with:

Generative AI models like ChatGPT and Gemini are trained on mountains of text data, allowing them to learn how language flows and what kind of responses are likely in different situations. When prompted, they use this knowledge to craft original text, like poems, code, or answers to your questions, striving to mimic the patterns they've absorbed.

It's interesting that ChatGPT-4's response was much longer and more detailed compared with the one from Gemini. It explains generative AI as a technology designed to create content and trained on "vast datasets" that identify patterns within the data and use it to create probabilistic responses. Gemini's answer also mentions the "mountains of text data" and explains that these models create new text from mimicking patterns. While these summaries provides a very basic explanation, I've also prepared a more technically informative explanation of generative AI. I used information I had collected from academic sources and then asked the tools to synthesize this information into the form of a summary.

**Generative AI's journey from the fringes to the forefront of AI discourse is largely due to recent breakthroughs that have progressively blurred the lines between human and machine capabilities. This transition, fuelled by advancements in deep learning, big data analytics, and computational power, has ushered in an age where machines can create content that resonates with human emotions, thoughts, and creativity. One of the biggest advancements has been in the field of natural language processing (NLP), which is the intersection of computer science, artificial intelligence (AI), and linguistics. The goal of NLPs is to enable computers to understand, interpret, and generate human languages in a way that is both valuable and meaningful.**

The introduction of transformers to the field in 2017 by Vaswani et al. in their paper, *Attention Is All You Need*, has significantly improved performance in natural language processing (NLP) tasks.<sup>18</sup> The transformers differ from earlier models by relying heavily on a mechanism called self-attention. This allows the model to weigh the importance of different words in a sentence, regardless of their position, leading to a more nuanced understanding of context.

These transformers are behind the success of models like Google's Gemini and OpenAI's ChatGPT (where the "GPT" stands for Generative Pretrained Transformer), which are pre-trained on a large body of text and fine-tuned with additional data to improve their accuracy and responsiveness. These tools are able to constantly evolve based on this fine-tuning process, which is why there has been such a vast improvement in the quality of the output of ChatGPT since it was introduced two years ago.

I hope that this has given you a simple understanding of how these tools work, and you've also now gotten to see how I will differentiate between the three different types of text (AI, AI-influenced, and my own). By distinguishing between these three types of texts I am actively encouraging you as the reader to pay attention to the different voices each one has, and to be critical of what they/I am saying.

### **What do I mean by Accountability and Transparency?**

Earlier I mentioned that two of the main themes I encountered in my research on AI tools were accountability and transparency. The terms "accountability" and "transparency" are often found together in a lot of the ethical conversations surrounding AI tools like ChatGPT and Gemini.<sup>19</sup> Currently, these tools operate within a "black box" where a prompt goes in and an answer comes out, but there is no way to follow the journey from start to finish. This inability to source information is vastly different from how information was collected and presented in the past (in a book, paper or later on a website). The introduction of internet search engines certainly complicated matters and it became more difficult to determine the quality of the information that was accessible. However, it was still possible to see where the

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<sup>18</sup> Ashish Vaswani et al., "Attention Is All You Need," in *31st Conference on Neural Information Processing Systems (NIPS 2017)*, Long Beach, CA, USA, 2017, doi:10.48550/arXiv.1706.03762.

<sup>19</sup> There is even a recurring computer science conference called the "Conference on Fairness, Accountability, and Transparency" which is described as having a "cross-disciplinary focus that brings together researchers and practitioners interested in fairness, accountability, and transparency in socio-technical systems." ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT), last modified April 19, 2024, <https://facctconference.org/>.

information came from — was it from a news website, a personal blog, Wikipedia or a Facebook rant? Now we have no way of knowing if ChatGPT is using your aunt's facebook post or an academic paper when it answers prompts.

So why is this such a big deal? It's concerning for multiple reasons, but it can be simplified into three main points:

1. **Spread of Misinformation** - How do I know if this answer is true or false?
2. **Reinforcement of Biases** - Is this answer sexist, racist or in other ways reinforcing existing harmful societal biases?
3. **Data Privacy, Plagiarism and Copyright** - Is my data and intellectual property being used without my consent?

As is traditional in academic papers, I will now include support of these three points from three separate academic articles. In discussions on the concern of the spread of misinformation, the article, *ChatGPT: Five Priorities for Research*, discusses how these tools have a tendency to generate content that, while plausible, may not always align with verified scientific data or accurately represent the complexity of research findings.<sup>20</sup> In the context of academia Van Dis et al. state, "Researchers who use ChatGPT risk being misled by false or biased information, and incorporating it into their thinking and papers."<sup>21</sup> I'll be using this article again later on as it does an excellent job of summarizing a lot of the current concerns of using ChatGPT in academia.

As I previously explained, AI tools like ChatGPT and Gemini use large datasets to learn patterns and predict which responses to give to prompts. It may initially be hard to see where human biases come from in this process, as there is no active human participation. The human influence comes both from the algorithms that are used in this process (which were designed by humans) and the data itself (which can be seen as a sample of humanity). In their paper, *On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?*, the authors discuss the ways language models (another term for AI tools) are trained on big datasets and how the lack of accountability can reinforce dangerous biases.<sup>22</sup> They state:

The size of data available on the web has enabled deep learning models to achieve high accuracy on specific benchmarks in NLP and computer vision applications.

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<sup>20</sup> Eva A.M. Van Dis et al., "ChatGPT: Five Priorities for Research," *Nature* 614 (2023): 224-226.

<sup>21</sup> Van Dis et al., "ChatGPT: Five Priorities," 224-225.

<sup>22</sup> Emily M. Bender et al., "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?" in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, Montreal, Canada, 2021, 610-623. doi:10.1145/3442188.3445922.

However, in both application areas, the training data has been shown to have problematic characteristics resulting in models that encode stereotypical and derogatory associations along gender, race, ethnicity, and disability status... We have identified a wide variety of costs and risks associated with the rush for ever larger LMs...and the risk of substantial harms, including stereotyping, denigration, increases in extremist ideology, and wrongful arrest, should humans encounter seemingly coherent LM output and take it for the words of some person or organization who has accountability for what is said.<sup>23</sup>

Simply put, they show that training AI tools on extremely large unfiltered datasets that are taken directly from the internet means we have no control or oversight of what patterns these tools are learning, and ultimately what biases and stereotypes they will continue to perpetuate. There is also no way of holding anyone accountable for the answers these tools provide, and whether those answers contain misinformation.

When it comes to concerns of data privacy, Eric Sarrion neatly summarizes this in his book, *Exploring the Power of ChatGPT: Applications, Techniques, and Implications*, saying:

The use of ChatGPT can have consequences on data confidentiality and security. During model training, the data used may contain sensitive and personal information, such as names, addresses, or medical information. If this data is not properly protected, it can lead to privacy violations and risks to individuals' security.<sup>24</sup>

Due to the current lack of accountability and transparency in the way AI tools are trained on datasets, there is no ability to know what personal data is being included and how it could potentially come out if the right prompt is asked. The next step is what happens when that personal data is *also* intellectual property, and if it's being used to create content without awareness or consent. To address this point, I will once again return to the article *ChatGPT: Five Priorities for Research*, where the authors state, "Inventions devised by AI are already causing a fundamental rethink of patent law, and lawsuits have been filed over the copyright of code and images that are used to train AI, as well as those generated by AI."<sup>25</sup> It's a complex matter, as while AI tools technically create new content, it is still based on the existing intellectual property of people that has been taken without their consent or knowledge.

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<sup>23</sup> Bender et al., "On the Dangers of Stochastic Parrots," 613.

<sup>24</sup> Eric Sarrion, *Exploring the Power of ChatGPT: Applications, Techniques, and Implications* (Berkeley, CA: Apress, 2023), 70.

<sup>25</sup> Van Dis et al., "ChatGPT: Five Priorities," 225.

When all the ethical problems with using these tools are laid out like this, it's very hard to see why we should be using them at all. Sadly, as is the case with most technology... if it makes the average person's life easier then it's going to be used, regardless of the consequences. If you are feeling offended by how simply I am brushing off the heavy ethical implications of using AI tools, please pull out your smartphone and use it to google conflict mining for smartphone materials.<sup>26</sup> I'd like to also quickly acknowledge my Screen Cultures education, which is where I learned about the ethical and environmental costs of smartphones.

Of course, in a perfect world we wouldn't knowingly use tools or technology that are ethically questionable. But in reality, when technology like smartphones or AI tools are released into the world, it is human nature to grab them tightly with both hands and only think to ask questions later. To support this evaluation, I bring in another quote from Van Dis et al. where they also acknowledge the inevitability of ChatGPT being used in academia. They state:

We think that the use of this technology is inevitable, therefore, banning it will not work... Rather than engage in a futile arms race between AI chatbots and AI-chatbot-detectors, we think the research community and publishers should work out how to use LLMs with integrity, transparency and honesty.<sup>27</sup>

For that reason, I will continue to use AI tools throughout the rest of this thesis while holding myself accountable by transparently showing the places I use them. I also plan to be actively critical of the answers I receive from these tools, and will be reviewing them for potential biases or inaccuracies. To summarize this section and reiterate why accountability and transparency are so important when using AI tools, I'm going to bring in the tools themselves. I prompted both ChatGPT-4 and Gemini Advanced: Can you summarize the main arguments around the need for accountability and transparency with AI tools like ChatGPT?

ChatGPT-4 responded with:

The main arguments for the need for accountability and transparency with AI tools like ChatGPT center on fostering trust and ethical use. Transparency helps stakeholders understand how AI decisions are made, which is crucial for evaluating fairness and detecting biases. Accountability ensures that there are mechanisms to address any harms caused by AI, including how data is used and managed. Together, these principles help ensure that AI tools are used responsibly, respecting user privacy and promoting fairness in AI applications. Gemini Advanced responded with:

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<sup>26</sup> Jennifer Scott, "How Conflict Minerals Make It into Our Phones," CNBC, last modified February 15, 2023, <https://www.cnbc.com/2023/02/15/how-conflict-minerals-make-it-into-our-phones.html>.

<sup>27</sup> Van Dis et al., "ChatGPT: Five Priorities," 224-225.

Accountability and transparency are crucial for generative AI tools like ChatGPT and Gemini. Without them, these powerful tools can be misused to spread misinformation, perpetuate biases, or even steal creative work. Their complex inner workings make it difficult to understand how they generate outputs, raising concerns about who's responsible for their actions and how to ensure they are used ethically. This lack of transparency makes it challenging to hold developers or users accountable for the tool's outputs, potentially leading to harmful consequences.

Sadly it is beyond my powers to give full transparency — I can't show how the AI made the decisions involved in the answers above and I have no idea where they sourced the information for these summaries. However, I can confirm that the main points they are making support what I have read and briefly summarized above — accountability and transparency are necessary to protect people's data and intellectual property, as well as prevent the spread of misinformation and the perpetuation of harmful biases. Before I move on to the next section, I'd just like to say that the ethics surrounding AI tools is a huge topic to cover, with enough material to fill at least a couple of books.<sup>28</sup> It was much too large to tackle within the scope of this thesis, but I still felt like it was necessary to give a simple overview of these major concerns as a way of providing additional context for the approach I take in this thesis.

### **What is academia saying about how you should use AI tools?**

This is the section that most closely resembles a traditional literature review. This means I will be summarizing some of the central scholarship that has been done on the topic I'm writing about — Academia and AI Tools. It's also a place to include other examples of scholars doing what I'm doing, as a way of setting precedence for the approach in this thesis (using AI tools for academic purposes). There has been a lot of discussion since the release of ChatGPT about the impact of AI tools on academic writing and research. The concerns have rippled through all areas of academia, and in my research I collected articles from journals on medicine (including dentistry and ophthalmology), teaching, philosophy, journalism, aviation studies, communication and media, mathematics, and computer sciences. I also found two books published just this year that specifically focus on the uses and potential impact of using AI tools in higher education.

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<sup>28</sup> Here is one such example: Julie E. Mehan, *Artificial Intelligence: Ethical, Social, and Security Impacts for the Present and the Future* (Cambridgeshire, United Kingdom: IT Governance Publishing, 2022).

Instead of taking the time to do an in-depth reading of all these sources (which by my estimates would have taken me at least a month or two), I have instead used ChatGPT-4 to summarize these sources. There are two main reasons for this, and the first is simply that due to previously mentioned personal issues I didn't have the time necessary to do an in-depth reading for all these sources. Secondly, this is a thesis about the process of writing a master's thesis and I need material for Chapter 5, where I will be analyzing the pros and cons of using AI tools for summarizing and synthesizing academic sources (a.k.a doing a lit. review). So whatever your thoughts, feelings, or concerns about the quality of the following literature review... please hold on to them as I will be exploring them in a couple of chapters!

At the time of writing this, ChatGPT-4 is the only AI tool that I have access to that allows for uploading of PDFs, which is what makes this process of summarizing sources possible. I took me one afternoon (roughly 4-5 hours) to find and then summarize around twenty-five articles, as well as two entire two books. I did not use any AI tools to help me find these sources, but instead did it the "old-fashioned" way by searching key words (including ChatGPT, education, and thesis writing) in Google Scholar and Oria, the University of Oslo's online library portal. In keeping with an accountable and transparent approach, the following section will be mostly in purple Avenir, emphasizing that the majority of the text was created through a collaborative process with AI tools.

I used ChatGPT-4 to summarize the sources I mention above, and I then went through each summary to identify the common themes between them. During this process I also skimmed the contents of each article and book to confirm that the AI generated summaries were correct. Throughout this process I identified three main sections into which the literature could be organized — the **uses** of AI tools, the current **concerns** around using them, and the suggestions for what needs to be done when using them **going forward**. I then used a combination of ChatGPT-4 and Gemini Advanced to synthesize these sources in the format of a traditional literature review. As I mentioned, I plan to talk more about this process of how I used these tools in Chapter 5, where I examine how AI tools can be used for summarizing and synthesizing sources. Right now, I will say that I learned a lot about the uses and drawbacks of using AI tools when working to make this literature review. The process of using these tools helped me find a very clear structure, but it was still more work than I anticipated to make a *cohesive* and *accurate* summary with the sources I collected. Before we get into it, I'd

also like to mention that the majority of these sources are about ChatGPT, as that is the AI tool that has been accessible for the longest amount of time to the widest audience.

### **Evolution of Tools as Part of Human Advancement**

One of the compelling narratives in the discourse surrounding AI tools in academia is their portrayal as a continuation in the evolution of educational resources. I touched on this point earlier when I brought up the calculator — another tool that felt completely disruptive to the education system but was accepted over time. In general, humans have been quick to adopt new technologies, and the biggest recent example of that is definitely the introduction, and almost complete worldwide adoption, of the smartphone. It seems almost dramatic to say it's a global adoption, because when has the majority of the human population ever agreed to do the same thing? However, Chan and Colloton in their book, *Generative AI in Higher Education*, reference the statistic “in 2020, 78% of the world’s population owned a smartphone; in 2016, it was less than half” which (surprisingly) supports this claim.<sup>29</sup>

All this is to say that humans, especially in recent history, have been happy to adopt new technologies, and many are predicting that AI tools are the next step in that evolution. This notion is supported by Gordijn and ten Have, who state, "One way of looking at ChatGPT is to regard it as just another tool in the ever-growing toolbox available to academics when conducting research and writing papers."<sup>30</sup> While I agree with this narrative, I also believe it's necessary to still be critical of the tools we include in our toolbox, something that is echoed in many of the academic sources on this topic.

### **Potential Uses of AI Tools**

AI tools hold immense potential to reshape the landscape of higher education, revolutionizing learning, research, and administrative processes. Firstly, in the realm of teaching and learning, AI-powered tools envision a future of personalized learning experiences. Intelligent tutoring systems can adapt to individual learning styles and

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<sup>29</sup> Cecilia Ka Yuk Chan and Tom Colloton, *Generative AI in Higher Education: The ChatGPT Effect* (New York: Routledge, 2024).

<sup>30</sup> Bert Gordijn and Henk ten Have, "ChatGPT: Evolution or Revolution?" *Medicine, Health Care and Philosophy* 26, no. 1 (2023): 2. <https://doi.org/10.1007/s11019-023-10136-0>

offer tailored feedback, catering to the diverse needs of students.<sup>31</sup> Rudolph et al. state, “It can be argued that intelligent tutoring systems (ITS) are one of the most promising benefits of artificial intelligence when it comes to transforming education, as they are one of the most effective tools for personalising instruction.”<sup>32</sup> AI tools can support learners outside traditional classroom hours, providing 24/7 study support and guidance to enhance knowledge retention.<sup>33</sup> This is especially beneficial for students with diverse schedules or those in remote learning environments.

Secondly, AI has the potential to streamline various research processes for students, educators, and scholars. Within seconds, AI-powered tools can sift through vast amounts of literature to provide concise summaries, identify knowledge gaps, or synthesize research findings efficiently.<sup>34</sup> Ariyaratne et al. discuss this, saying “The AI tool can facilitate literature review and help identify gaps in knowledge in a few seconds or minutes. It also has the potential to aid in data collection by organizing the collected data and writing manuscript drafts, saving the authors significant time.”<sup>35</sup> Alexander Sidorkin specifically advocates for “wraiting” — the blending of traditional writing with AI-assisted prompts — a method that can enhance efficiency and help researchers focus on analysis and interpretation of research findings.<sup>36</sup> Sidorkin begins his book by explaining, “The advent of the AI era introduces “wraiting,” which is simply writing with the help of AI. It can also be called AI-assisted writing. If harnessed effectively, it can foster a synergy between human creativity and the unbridled computational power of AI.”<sup>37</sup> Furthermore, AI's image analysis and pattern recognition capabilities make it an invaluable tool in

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<sup>31</sup> Alexander M. Sidorkin, *Embracing Chatbots in Higher Education: The Use of Artificial Intelligence in Teaching, Administration, and Scholarship* (New York: Routledge, 2024); Jürgen Rudolph, Samson Tan, and Shannon Tan, “ChatGPT: Bullshit Spewer or the End of Traditional Assessments in Higher Education?” *Journal of Applied Learning and Teaching* 6, no. 1 (2023): 1-22; Md. Mostafizer Rahman and Yutaka Watanobe, “ChatGPT for Education and Research: Opportunities, Threats, and Strategies,” *Applied Sciences* 13, no. 5783 (2023): 1-21.

<sup>32</sup> Rudolph, Tan, and Tan, “ChatGPT: Bullshit Spewer,” 9.

<sup>33</sup> David Baidoo-Anu and Leticia Owusu Ansah, “Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT in Promoting Teaching and Learning,” *Journal of AI* 7, no. 1 (2023): 52-62; Mohammad Aljanabi et al., “ChatGpt: Open Possibilities,” *Iraqi Journal for Computer Science and Mathematics* 4, no. 1 (2023): 62-64.

<sup>34</sup> Sisith Ariyaratne, Kathikeyan P. Iyengar, and Rajesh Botchu, “Will Collaborative Publishing with ChatGPT Drive Academic Writing in the Future?” *British Journal of Surgery* 110, no. 9 (2023): 1213-1214; Željana Bašić et al., “ChatGPT-3.5 as Writing Assistance in Students’ Essays,” *Humanities and Social Sciences Communications* 10, no. 750 (2023): 1-12; Himel Mondal and Shaikat Mondal, “ChatGPT in Academic Writing: Maximizing Its Benefits and Minimizing the Risks,” *Indian Journal of Ophthalmology* 71, no. 12 (2023): 3600-3606.

<sup>35</sup> Ariyaratne, Iyengar, and Botchu, “Collaborative Publishing with ChatGPT,” 1213.

<sup>36</sup> Sidorkin, *Embracing Chatbots in Higher Education*.

<sup>37</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 1.

disciplines like architecture, history, and art, where visual data analysis is crucial.<sup>38</sup> AI tools show promise in assisting academic writing, acting as an efficient co-author or writing assistant. For instance, AI can play a supportive role in drafting manuscripts, contributing to literature reviews, and generating thesis statements.<sup>39</sup> Importantly, AI tools can be used to break down language barriers, enabling non-native English speakers in academia to participate, contribute, and collaborate more effectively.<sup>40</sup> This democratizes access to knowledge and promotes inclusivity on a global scale. Culp summarizes this, stating “Importantly, it [ChatGPT] can function as a translator, as well, with command of two dozen languages, potentially extending access to large numbers of investigators for whom English is not a first language.”<sup>41</sup>

Beyond academics, AI's efficiency offers immense benefits in administrative tasks within higher education institutions.<sup>42</sup> Sidorkin dedicates an entire chapter to the administrative uses of AI tools within higher education, and at one point declares “When I say that the AI-powered chatbot changed my life as an administrator, I am not exaggerating. It has revolutionized my workflow, enabling me to delegate a large portion of tedious, time-consuming tasks.”<sup>43</sup> AI can streamline processes such as student records management, course scheduling, syllabus creation, and resource allocation.<sup>44</sup> This frees up faculty and staff time to focus on higher-order tasks, ultimately enhancing the overall student experience. The vast potential of AI in higher education is undeniable,

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<sup>38</sup> Neves, Pedro Soares. "Chat GPT AIS 'Interview' 1, December 2022." *Architecture Image Studies* 3, no. 2 (2022): 58-67.

<sup>39</sup> Hee-Seung Henry Bom, "Exploring the Opportunities and Challenges of ChatGPT in Academic Writing: a Roundtable Discussion," *Nuclear Medicine and Molecular Imaging* 57 (2023): 165-167; William C. Culp Jr, "Artificial Intelligence and ChatGPT: Bane or Boon for Academic Writing?" *Journal of Education in Perioperative Medicine* Vol. XXV, Issue 2 (2023): 1-10; Ismail Dergaa et al., "From Human Writing to Artificial Intelligence Generated Text: Examining the Prospects and Potential Threats of ChatGPT in Academic Writing," *Biology of Sport* 40, no. 2 (2023): 615-622; Mondal and Mondal, "ChatGPT in Academic Writing," 3600-3606; John V. Pavlik, "Collaborating With ChatGPT: Considering the Implications of Generative Artificial Intelligence for Journalism and Media Education," *Journalism & Mass Communication Educator* 78, no. 1 (2023): 84-93.

<sup>40</sup> Adeeb M. Jarrah, Yousef Wardat, and Patricia Fidalgo, "Using ChatGPT in Academic Writing is (Not) a Form of Plagiarism: What Does the Literature Say?" *Online Journal of Communication and Media Technologies* 13, no. 4 (2023): e202346; Baidoo-Anu and Ansah, "Education in the Era of Generative Artificial Intelligence," 52-62; Chan and Colloton, *Generative AI in Higher Education*; Culp, "Artificial Intelligence and ChatGPT," 1-10; Dergaa et al., "From Human Writing to Artificial Intelligence," 615-622; Lea Bishop, "A Computer Wrote this Paper: What ChatGPT Means for Education, Research, and Writing," (Unpublished manuscript, 2023).

<sup>41</sup> Culp, "Artificial Intelligence and ChatGPT," 1.

<sup>42</sup> Sidorkin, *Embracing Chatbots in Higher Education*; Chan and Colloton, *Generative AI in Higher Education*.

<sup>43</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 73.

<sup>44</sup> In *Generative AI in Higher Education*, Chan and Colloton dedicate an entire chapter to “Strengths and Weaknesses in Embracing ChatGPT in Curriculum Design.”

paving the way for personalized learning, efficient research, collaboration, and streamlined administrative processes.

## Concerns Surrounding AI

While the transformative potential of AI in higher education is undeniable, its integration raises significant concerns that must be carefully addressed. One of the most pressing issues is the spread of misinformation stemming from AI's tendency to generate factually incorrect yet plausibly written content.<sup>45</sup> These mistakes, termed "hallucinations," can introduce significant errors and distort knowledge within academic contexts.<sup>46</sup> Tang et al. discuss this,

One perspective relates to the phenomenon known as artificial hallucination, where generative AI models can produce text that appears coherent and meaningful but is actually fictional or lacks accuracy. Another well-known hallucination effect reported by some academic researchers is that generative AI tools sometimes include references of scientific studies that do not exist.<sup>47</sup>

Due to this problem, it is crucial for researchers and students to remain vigilant, cross-referencing AI-generated content with reliable sources to prevent the perpetuation of inaccuracies.

Other ethical concerns centre on the potential for unchecked AI use in producing academic work, which threatens principles of plagiarism, copyright, and the overall integrity of research.<sup>48</sup> The ease with which students can procure AI-generated text for assignments blurs the line between original thought and outsourcing critical thinking tasks to AI tools. This erodes the core value of student learning and assessment and necessitates a rethinking of traditional assessment practices.

Other concerns include worries of an over-dependence on tools like ChatGPT for writing and research tasks hindering the development of students' critical thinking and

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<sup>45</sup> Baidoo-Anu and Ansah, "Education in the Era of Generative Artificial Intelligence," 52-62; Culp, "Artificial Intelligence and ChatGPT," 1-10; Gordijn and ten Have, "ChatGPT: Evolution or Revolution?" 2; Sidorkin, *Embracing Chatbots in Higher Education*; Van Dis et al., "ChatGPT: Five Priorities," 224-226.

<sup>46</sup> Culp, "Artificial Intelligence and ChatGPT," 1-10; Arthur Tang et al., "The Importance of Transparency: Declaring the Use of Generative Artificial Intelligence (AI) in Academic Writing," *Journal of Nursing Scholarship* 56 (2024): 314-318; Sidorkin, *Embracing Chatbots in Higher Education*.

<sup>47</sup> Tang et al., "The Importance of Transparency," 315.

<sup>48</sup> Bishop, "A Computer Wrote this Paper."; Chan and Colloton, *Generative AI in Higher Education*; Divesh Sardana, Timothy R. Fagan, and John Timothy Wright, "ChatGPT: A Disruptive Innovation or Disrupting Innovation in Academia?" *Journal of the American Dental Association* 154, no. 5 (2023): 361-364; Gordijn and ten Have, "ChatGPT: Evolution or Revolution?" 2; Jarrah, Wardat, and Fidalgo, "Using ChatGPT in Academic Writing," e202346; Rudolph, Tan, and Tan, "ChatGPT: Bullshit Spewer," 1-22; Sidorkin, *Embracing Chatbots in Higher Education*; Tang et al., "The Importance of Transparency," 314-318.

analytical skills.<sup>49</sup> The concern is that without developing independent research skills, students risk becoming overly reliant on AI, potentially stifling their creativity and their ability to synthesize information originally and produce innovative insights. Chan and Colloton discuss this, stating,

The ease with which students can procure detailed answers might blur the boundaries of independent research and reliance on AI-generated content... Furthermore, although the extensive knowledge base of ChatGPT is commendable, there is a genuine risk of information overload. The sheer volume of content it can generate has the potential to distract students from focusing on core curriculum topics, leading them down endless tangents of information.<sup>50</sup>

While I understand that this seems like a genuine concern, I think worrying that students will be distracted by too much information seems a bit silly. Especially when you consider that most students going into their first year of university in 2024 were born *after* Google was released (September 4, 1998), and currently live in a world of google searches, TikTok videos and Instagram reels. It seems a bit counterintuitive (and arguably counterproductive) to worry that they will suddenly succumb to the dangers of information overload. If anything, it seems more likely that the younger generations of students will be adept at sorting through these vast amounts of information.

Another concern I've already touched upon as a recurring theme in the literature is the lack of transparency around the use of AI tools, which could compromise the integrity of the academic enterprise. The inherent "black box" nature of AI models makes it difficult to understand their reasoning and biases.<sup>51</sup> If AI outputs are uncritically accepted without a clear understanding of how they were generated, there is a danger of replicating existing biases or perpetuating misinformation. Chan and Colloton address this, stating,

One of the significant challenges with advanced AI models is that they are "black boxes", meaning it can be difficult to understand how AI systems work and why they make the decisions that they do. Transparency, explainability, and interpretability are crucial for users to understand, trust, and effectively manage AI technologies.<sup>52</sup>

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<sup>49</sup> Bishop, "A Computer Wrote this Paper."; Chan and Colloton, *Generative AI in Higher Education*; Pavlik, "Collaborating With ChatGPT," 94-93.

<sup>50</sup> Chan and Colloton, *Generative AI in Higher Education*, 55.

<sup>51</sup> Chan and Colloton, *Generative AI in Higher Education*.

<sup>52</sup> Chan and Colloton, *Generative AI in Higher Education*, 127.

As AI's role in education expands, concerns about data privacy and potential misuse also arise. The data used to train AI models raises critical ethical questions about who owns the data, how it's used, and how sensitive information is protected. It's crucial to establish robust guidelines around data collection, storage, and access to ensure privacy remains a central concern.<sup>53</sup>

### **Path Forward: Responsible Integration of AI**

To harness the transformative power of AI tools while safeguarding the values of higher education, experts advocate for a concerted effort towards responsible integration. At the core of this endeavour lies the urgent development of transparent guidelines to address issues of authorship, copyright, the responsible uses of AI, and the necessity of human oversight within all stages of the research process.<sup>54</sup> These guidelines are essential for defining AI's role as a research tool and emphasizing the need for transparency, accountability, and the preservation of the creative and critical thinking processes central to original scholarship.

The academic community generally agrees that, due to its inability to independently conceive of research questions or take full accountability for findings, AI alone cannot be considered a full author (something I'll address in more detail in the next section). However, its contribution to research shouldn't be completely overlooked. For example, Sidorkin's "wraiting" provides a possible framework for ethical integration: humans maintain creative control and responsibility while leveraging AI as a tool for efficiency and idea generation.<sup>55</sup>

Prioritizing open-source AI tools, where possible, can increase transparency and mitigate risks associated with proprietary models, where decision-making processes

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<sup>53</sup> Eugène Loos, Johanna Gröpler, and Marie-Louise Sophie Goudeau, "Using ChatGPT in Education: Human Reflection on ChatGPT's Self-Reflection," *Societies* 13, no. 196 (2023): 1-18; Mondal and Mondal, "ChatGPT in Academic Writing," 3600-3606; Rahman and Watanobe, "ChatGPT for Education and Research," 1-21.

<sup>54</sup> Ariyaratne, Iyengar, and Botchu, "Collaborative Publishing with ChatGPT," 1213-1214; Arosh S. Perera Molligoda Arachchige and Niccolò Stomeo, "Exploring the Opportunities and Challenges of ChatGPT in Academic Writing: Reply to Bom et al," *Nuclear Medicine and Molecular Imaging* 57 (2023): 213-214; Bom, "Exploring the Opportunities and Challenges of ChatGPT," 165-167; Chan and Colloton, *Generative AI in Higher Education*; Jarrah, Wardat, and Fidalgo, "Using ChatGPT in Academic Writing," e202346; Mohammad Awad AlAfnan et al., "Chatgpt as an Educational Tool: Opportunities, Challenges, and Recommendations for Communication, Business Writing, and Composition Courses," *Journal of Artificial Intelligence and Technology* 3, no. 2 (2023): 60-68; Sardana, Fagan, and Wright, "ChatGPT: A Disruptive Innovation," 361-364; Sidorkin, *Embracing Chatbots in Higher Education*; Tang et al., "The Importance of Transparency," 314-318; Van Dis et al., "ChatGPT: Five Priorities," 224-226.

<sup>55</sup> Sidorkin, *Embracing Chatbots in Higher Education*.

and inherent biases may be less visible.<sup>56</sup> This “opening up the black box” approach fosters greater understanding of the mechanisms behind AI outputs, aiding researchers in critically evaluating the tools they use. Van Dis et al. summarize this important point,

To counter this opacity, the development and implementation of open-source AI technology should be prioritized. Non-commercial organizations such as universities typically lack the computational and financial resources needed to keep up with the rapid pace of LLM development. We therefore advocate that scientific-funding organizations, universities, non-governmental organizations (NGOs), government research facilities and organizations such as the United Nations — as well tech giants — make considerable investments in independent non-profit projects. This will help to develop advanced open-source, transparent and democratically controlled AI technologies.<sup>57</sup>

In addition to advocating for open-source transparency, creating clear guidelines for using AI tools is a recurring theme in the literature.<sup>58</sup> In their paper, *Using ChatGPT in Academic Writing is (Not) a Form of Plagiarism: What Does the Literature Say?*, Jarrah et al. include a comprehensive set of guidelines for the use of ChatGPT in academic writing. I’ve included an image of them below, and I’ve also highlighted the first five points as they are the guidelines that are relevant for this thesis. Specifically, I have made sure to proofread, edit, and verify the information I have used from AI tools. I have also created a framework to demonstrate full transparency of how and where I am using these tools. I have also generally worked with both ChatGPT and Gemini, in order to avoid fully relying on a single AI tool, and taken a critical approach to using them in order to understand their limitations.

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<sup>56</sup> Van Dis et al., "ChatGPT: Five Priorities," 224-226.

<sup>57</sup> Van Dis et al., "ChatGPT: Five Priorities," 225.

<sup>58</sup> AIAfnan et al., "Chatgpt as an Educational Tool," 60-68; Ariyaratne, Iyengar, and Botchu, "Collaborative Publishing with ChatGPT," 1213-1214; Chan and Colloton, *Generative AI in Higher Education*; Dergaa et al., "From Human Writing to Artificial Intelligence," 615-622; Jarrah, Wardat, and Fidalgo, "Using ChatGPT in Academic Writing," e202346; Nicolas Schwenke, Heinrich Söbke, and Eckhard Kraft, "Potentials and Challenges of Chatbot-Supported Thesis Writing: An Autoethnography," *Trends in Higher Education* 2 (2023): 611–635; Perera Molligoda Arachchige and Stomeo, "Opportunities and Challenges of ChatGPT," 213-214; Sardana, Fagan, and Wright, "ChatGPT: A Disruptive Innovation," 361-364; Sidorkin, *Embracing Chatbots in Higher Education*; Tang et al., "The Importance of Transparency," 314-318; Van Dis et al., "ChatGPT: Five Priorities," 224-226.

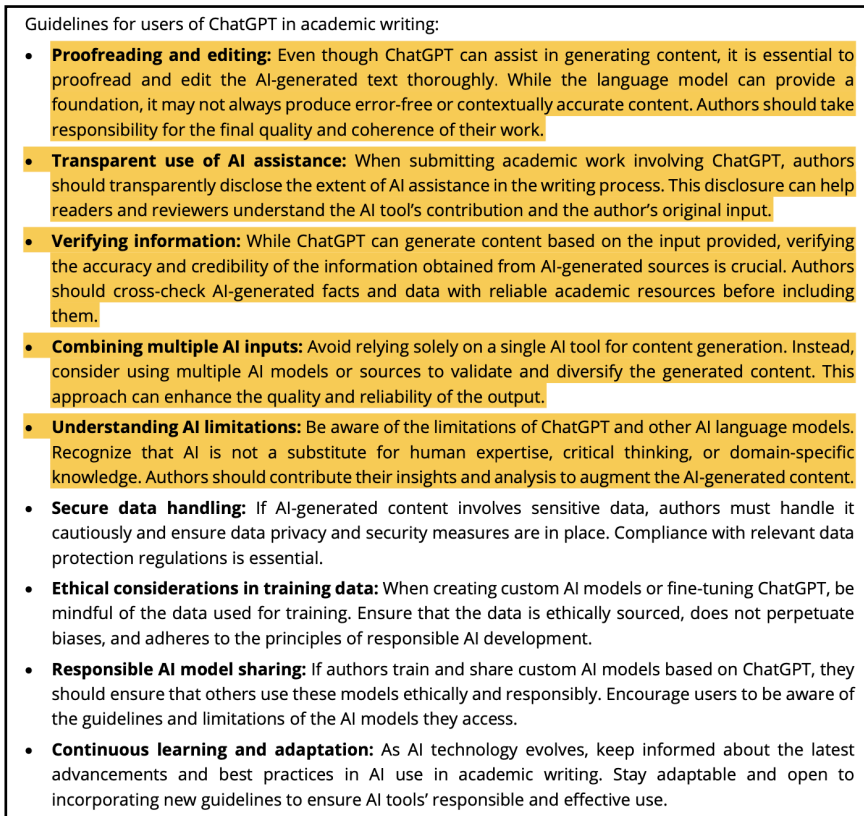


Image 3 (Above): Guidelines for users of ChatGPT in academic writing.<sup>59</sup>

While guidelines like these are a useful starting framework for academic scholars, they will not be enough for students in higher education. With the introduction of AI tools in schools, there is now a greater need to adapt assessment methods that uphold academic integrity and promote the development of the higher-order thinking skills (which AI cannot easily replicate).<sup>60</sup> This could mean shifting emphasis from traditional written assignments toward oral presentations, process-based assessments that highlight the development of ideas, and projects focused on critical analysis, rather than the mere reproduction of information.<sup>61</sup>

As well, fostering AI literacy in both students and educators, is another necessary step towards responsible AI integration. Chan and Colloton tackle this, stating:

For students, it is about cultivating a skill set that is synchronously technical and critical, preparing them not only for existing job markets, but also equipping them to

<sup>59</sup> Jarrah, Wardat, and Fidalgo, "Using ChatGPT in Academic Writing," 16.

<sup>60</sup> Alafnan et al., "Chatgpt as an Educational Tool," 60-68; Bašić et al., "ChatGPT-3.5 as Writing Assistance," 1-12; Chan and Colloton, *Generative AI in Higher Education*; Jarrah, Wardat, and Fidalgo, "Using ChatGPT in Academic Writing," e202346; Rudolph, Tan, and Tan, "ChatGPT: Bullshit Spewer," 1-22.

<sup>61</sup> In *Generative AI in Higher Education*, Chan and Colloton discuss this in their chapter, Redesigning Assessment in the AI Era.

ethically, strategically, and innovatively navigate future landscapes that will undoubtedly be even more densely interwoven with technology. For educators and administrators, AI literacy is pivotal for astute policy formulation, ensuring that governance and regulatory frameworks are effective in addressing the intricacies and ethical conundrums of implementing AI technologies in academic contexts.<sup>62</sup>

**To this point, students will need to develop skills in critically evaluating AI-generated information, identifying potential biases, and understanding how to use AI ethically and appropriately within their disciplines.<sup>63</sup> This will empower them to leverage the benefits of AI technology while still recognizing its limitations and the need for independent critical thought.**

The timeline for actually achieving this level of AI literacy is hard to predict, though Rudolph et al. voice concerns that “the bureaucratic inertia of many university environments” will drag this process out.<sup>64</sup> The authors also include a reference to a rather critical timeline published in an article in *The Atlantic* back in December 2022 (right after the release of ChatGPT-3):

10 years for academia to face this new reality: two years for the students to figure out the tech, three more years for the professors to recognize that students are using the tech, and then five years for university administrators to decide what, if anything, to do about it.<sup>65</sup>

I’m including this quote for emphasis, as I see this being one of the major challenges academia is currently facing. As a mature student who has studied for over a decade, I’m very familiar with the complex and often rigid bureaucracy within academia. As a student of medieval history, I am also quite familiar with the incredibly long and illustrious history of the university institution. Indeed, history and tradition are often a point of pride for many institutions (often symbolized by a crest or coat of arms with a prominent founding date), but I see this preoccupation with tradition and history in many ways at odds with the current reality of the new world of AI. These tools evolve in the span of weeks and months (something I’ve continuously struggled to keep up with over the course of writing this thesis).

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<sup>62</sup> Chan and Colloton, *Generative AI in Higher Education*, 25.

<sup>63</sup> Chan and Colloton, *Generative AI in Higher Education*; Sidorkin, Embracing Chatbots in Higher Education.

<sup>64</sup> Rudolph, Tan, and Tan, "ChatGPT: Bullshit Spewer," 13.

<sup>65</sup> Stephen Marche, "The College Essay is Dead: Nobody is Prepared for How AI Will Transform Academia," *The Atlantic*, December 7, 2022, <https://www.theatlantic.com/technology/archive/2022/12/chatgpt-ai-writing-college-student-essays/672371/>.

If universities want to stay a relevant place for education they will need to reconsider their approach to policies, guidelines, assessments and much more.

These concerns are also applicable to academia as a whole, and many scholars are seeing that responsible integration demands continuous evaluation and adaptation in the face of this rapidly evolving technology. Ongoing research into the impact of AI tools, coupled with a proactive approach to ethical frameworks and policy development are essential for ensuring AI's use aligns with the core principles of academia in the long term.<sup>66</sup> This necessitates an open dialogue within academic institutions, a commitment to transparency, and a willingness to revise and update practices as new challenges and opportunities emerge within this evolving AI-driven landscape.

### **Setting a Precedence or Sparking a Debate: Who is using AI tools?**

While many of the articles I included in the literature review addressed the potential uses of AI tools within academic writing, a few scholars went the extra step to use them in their academic processes. While compiling sources for this literature review, I identified four articles that explicitly stated the use of AI tools.

1. In their article, *From Human Writing to Artificial Intelligence Generated Text: Examining the Prospects and Potential Threats of ChatGPT in Academic Writing*, Dergaa et al. declare, “Anecdotally, and intentionally, the authors would like to acknowledge the assistance of ChatGPT in the writing sections (boxes 1 to 3) of our article.”<sup>67</sup>
2. In his article, *Collaborating With ChatGPT: Considering the Implications of Generative Artificial Intelligence for Journalism and Media Education*, John Pavlik states, “The current essay is coauthored between a human journalism and media studies professor and a natural language processing (NLP) platform known as ChatGPT (OpenAI, 2022).”<sup>68</sup>
3. In *Using ChatGPT in Education: Human Reflection on ChatGPT’s Self-Reflection*, Loos et al. acknowledge using ChatGPT, “While reading Sections 1–3, you might have wondered whether ChatGPT had generated the text. The answer is, yes—it had indeed done so. ChatGPT-3 generated the text for Sections 1–3, in response to the questions we posed on 5 February 2023 shown in each section’s heading.”<sup>69</sup>
4. In the article, *ChatGPT: Open Possibilities*, Aljanabi et al. do not include a description of their uses of AI tools, however, ChatGPT is listed as an author on the article.<sup>70</sup>

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<sup>66</sup> Chan and Colloton, *Generative AI in Higher Education*; Sidorkin, *Embracing Chatbots in Higher Education*; Rahman and Watanobe, “ChatGPT for Education and Research,” 1-21; Rudolph, Tan, and Tan, “ChatGPT: Bullshit Spewer,” 1-22.

<sup>67</sup> Dergaa et al., “From Human Writing to Artificial Intelligence,” 622.

<sup>68</sup> Pavlik, “Collaborating With ChatGPT,” 84.

<sup>69</sup> Loos, Gröpler, and Goudeau, “Using ChatGPT in Education,” 18.

<sup>70</sup> Aljanabi et al., “ChatGpt: Open Possibilities,” 62-64.

In the above examples, scholars from vastly different disciplines (sports biology, journalism and media, sociology, and computer sciences and mathematics) all contribute to setting a new precedent for the use of AI tools in an academic context, either by acknowledging AI assistance or attributing the role of authorship to these tools. However, setting this type of precedence has also sparked debate among scholars about how these tools should be acknowledged when used in an academic context, with many scholars arguing against the use of “co-author”. In their article, *The Importance of Transparency: Declaring the Use of Generative Artificial Intelligence (AI) in Academic Writing*, Tang et al. describes this argument:

Recent debates among academic researchers suggest that crediting generative AI systems as the co-author of academic research articles is not suitable, as these systems do not fulfill the criteria for a study author, because they cannot take responsibility for the content and integrity of scientific papers.<sup>71</sup>

In their article, *ChatGPT: A Disruptive Innovation or Disrupting Innovation in Academia?*, Sardana et al. explore the impact of AI tools within the field of dentistry, as well as the broader implications for academia. They include the criteria from the International Committee of Medical Journal Editors that defines the role of authors and contributors, which are:

1. substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work
2. drafting the work or revising it critically for important intellectual content
3. final approval of the version to be published
4. agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved<sup>72</sup>

The authors conclude, “Thus, even in the best scenarios and advancement, ChatGPT does not meet criteria 1 and 4 above and might fail to qualify for co-authorship.”<sup>73</sup> I would argue that in many ways ChatGPT or Gemini could meet criteria 1, as they can be used for design of the work or the analysis of data. However, I completely agree that these tools can in no way be held accountable for what they produce, and (as previously mentioned) that accountability is one of the biggest concerns for the ethical use of these tools. For this reason, I agree that AI

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<sup>71</sup> Tang et al., "The Importance of Transparency," 314-318.

<sup>72</sup> Sardana, Fagan, and Wright, "ChatGPT: A Disruptive Innovation," 361.

<sup>73</sup> Sardana, Fagan, and Wright, "ChatGPT: A Disruptive Innovation," 361.

tools should not be acknowledged as “co-author”. Instead, for authors to continue to be held accountable for their work, it is now necessary to acknowledge when AI tools are used as part of the academic process.

While the degree of concern around the use of these tools varies from scholar to scholar, certain journals are making a clear stance against using these tools in academic publishing. For example, the Editor-in-Chief of *Science* journals, H. H. Thorp, released an editorial about the topic titled, *ChatGPT is Fun, but Not an Author*, where he states:

For the *Science* journals, the word “original” is enough to signal that text written by ChatGPT is not acceptable: It is, after all, plagiarized from ChatGPT. Further, our authors certify that they themselves are accountable for the research in the paper. Still, to make matters explicit, we are now updating our license and Editorial Policies to specify that text generated by ChatGPT (or any other AI tools) cannot be used in the work, nor can figures, images, or graphics be the products of such tools. And an AI program cannot be an author.<sup>74</sup>

I find the above quote quite interesting as it shows the true disruptive power of these tools. Thorp is clearly very concerned and critical of these tools, based on the use of the word “plagiarized” (arguably one of the most loaded terms within academia), and the decision to update the journal’s editorial policy to completely ban any AI generated material. While I understand the concerns being raised towards accountability and originality of authorship (something that I will explore in the coming chapters), I do believe that the complete banning of AI tools shows a rigidity that in many ways contradicts the exploratory nature of the scientific method.

Instead, I support the need to explore the uses of these tools within academia, which is one of the reasons I decided to write this meta-thesis. I saw a precedence being set by the scholars I referenced, who explored the ways these tools could be used and also sparked a necessary debate around the ethics of transparency, accountability, authorship and academic integrity. This thesis will be another exploration and negotiation of the boundaries of AI tool use within academia and higher education, and I will consider it a success if it helps to set further precedence and/or sparks more debate.

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<sup>74</sup> H. H. Thorp, "ChatGPT is Fun, but Not an Author," *Science* 379, no. 6630 (2023): 313, <https://doi.org/10.1126/science.adg7879>.

## CHAPTER 3: Welcome to My Methodological Tea Party

I've realized that I've slipped into a more "academic" writing style during the literature review, so here's my attempt to once again, in the immortal words of Taylor Swift — *shake it off*.<sup>75</sup> So far this thesis has been written chronologically, and at the time of writing this sentence, I'm halfway done Chapter 3. I've approached this thesis in a very organic way. I had a general idea of what I wanted to do (i.e. the AI Assisted Meta-Thesis), so I sat down and started writing. When I began, I did not have a concrete methodology in mind... and I didn't really worry about it.

While reading up on creativity for Chapter 3, I stumbled upon a very unusual article titled, *Posthuman Creativity: Unveiling Cyborg Subjectivity Through ChatGPT*.<sup>76</sup> The author describes the article as a narrative experiment that expands upon Wyatt and Gale's practice of "writing to it" (something I'll address in more detail further down). While the article itself was quite strange and written using quite academically dense language (at least in my opinion), it did serve as an interesting starting point that took me down a methodological rabbit hole.

Through the looking glass, I encountered quite a bit of philosophy of language, a little bit of discourse theory, a heavy critique of qualitative methodology, a smidge of posthumanism, a touch of postmodernism, a dash of creative writing, and a few lines of poetry. I also ran into some big names in academia — Derrida, Deleuze, Guattari, Spinoza, and Foucault — to name just a few. I did not land on a specific methodological approach or framework, but instead I gathered a collection of ideas and quotes that felt relevant to what I'm trying to do here. I'll now ask you to take a sojourn with me to Wonderland (to run with this analogy), where I will introduce you to the different guests I've invited to my methodological tea party.

### The Cheshire Cat

The first person I ran into was Laurel Richardson (my Cheshire Cat if you will) who talked about *Getting Personal* in her approach to writing. Specifically, she describes writing as a method of inquiry:

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<sup>75</sup> Swift, Taylor. "Shake It Off." Track 6 on *1989* (Big Machine Records, 2014.)

<sup>76</sup> Dave Yan, "Posthuman Creativity: Unveiling Cyborg Subjectivity Through ChatGPT," *Qualitative Inquiry* (2024): 1-12.

*Writing is a method of discovery*, a way of finding out about yourself and your world. When we view writing as a *method*, we experience ‘language in-use,’ how we ‘word the world’ into existence ... And then we ‘reword’ the world, erase the computer screen, check the thesaurus, move a paragraph, again and again. This ‘worded world’ never accurately, precisely, completely captures the studied world, yet we persist in trying. Writing as a method of inquiry honors and encourages the trying, recognizing it as emblematic of the significance of language.<sup>77</sup>

As someone who is approaching this thesis as an exploration, using my writing as a method of discovery feels very much a part of what I’m doing. The world introduced new technology, something that made me question the academic status quo I had been moving along with for the past ten years. Now, I felt encouraged to try something new, and writing in a new way felt the best way to reflect this change. Sure, it’s messier and less formal than the traditional style, but it also leaves more room for something *new*. To reiterate my point I will again quote Richardson:

I write because I want to find something out. I write in order to learn something that I did not know before I wrote it. I was taught, though, as perhaps you were, too, not to write until I knew what I wanted to say, until my points were organized and outlined... Much of that writing is simply not interesting to read because adherence to the model requires writers to silence their own voices, to view themselves as contaminants... Homogenization occurs through the suppression of individual voices and the acceptance of the omniscient voice of science or scholarship or the social-script as if it were our own.<sup>78</sup>

Through writing this thesis (about writing a thesis) I’m hoping to learn something new... whether that’s about myself, about AI tools, about academia, or about the future of all three of them. Richardson situates this as a postmodernist approach, one that does not “automatically reject conventional methods as false or archaic; it simply opens them to critique, as it does the new methods of knowing, as well.”<sup>79</sup> Perhaps you could say I am taking a postmodernist approach to writing this thesis because I’m critiquing the perceived value of the academic writing style, and opening up myself up to a new way of knowing through writing.

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<sup>77</sup> Laurel Richardson, "Getting Personal: Writing-Stories," *International Journal of Qualitative Studies in Education* 14, no. 1 (2001): 35.

<sup>78</sup> Richardson, "Getting Personal," 35.

<sup>79</sup> Richardson, "Getting Personal," 35.

## The March Hare and the Dormouse

The next guests I will introduce are Eileen Honan and David Bright (a.k.a. my March Hare and Dormouse), who wrote an excellent article titled, *Writing a Thesis Differently*.<sup>80</sup> In their article they describe “the “post-qualitative” movement, where researchers attempt to “imagine and accomplish an inquiry that might produce different knowledge and produce knowledge differently.”<sup>81</sup> They give a heavy critique of traditional qualitative methodology and academic writing, stating:

This orthodoxy [of qualitative research] produces and is a product of the “thousands of textbooks, handbooks, and journal articles that have secured qualitative methodology by repeating the structure in book after book with the same chapter headings so that we now believe it is true and real” . . . Just as with method, writing too has become (at least potentially) conventional, reductionist and hegemonic. The proliferation of textbooks, handbooks and journal articles, as well as blogs and websites offering advice and instruction on “writing your thesis” forms a textual maze through which doctoral students must navigate.<sup>82</sup>

They go on to describe the structure of a thesis (which I outlined in the introduction) as a recurring framework that is in many ways limiting, and they argue will not necessarily produce new thoughts. They specifically argue this point saying:

Our argument, following Deleuze, is that it is imperative for doctoral students *not* to adapt their thinking and writing to what is required precisely because:

“the problem is not to direct or methodically apply a thought which pre-exists in principle and in nature, but to bring into being that which does not yet exist (there is no other work, all the rest is arbitrary, mere decoration). To think is to create – there is no other creation – but to create is first of all to engender “thinking” in thought.”<sup>83</sup>

While reading this, I very much resonated with the ways they challenged traditional academic approaches to both writing and methodology. When I first read this paper, I felt like it was very similar to what I had already started to do when I wrote the first chapter of this thesis. My next thought was that I could use this as a methodological framework that I could drape over this thesis in order to appease the academic strictures of the “thesis” structure. The next thought after that was . . . by doing so I would be in many ways contradicting the very approach this method is suggesting — which is to not fall victim to the need to fit neatly into

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<sup>80</sup> Eileen Honan and David Bright, "Writing a Thesis Differently," *International Journal of Qualitative Studies in Education* 29, no. 5 (2016): 731-743.

<sup>81</sup> Honan and Bright, "Writing a Thesis Differently," 731.

<sup>82</sup> Honan and Bright, "Writing a Thesis Differently," 732.

<sup>83</sup> Quote from Gilles Deleuze in Honan and Bright, "Writing a Thesis Differently," 733.

preconceived academic structures. While I do not plan to completely disregard the thesis structure, or base my *entire* methodology off of Deleuzian philosophy, I will say that Honan and Bright are welcome guests at my methodological tea party and their perspectives should be kept in mind while reading this thesis. They talk about “not writing according to what is expected, but writing to create - to bring something to life.”<sup>84</sup>, which is what I hope to accomplish with my approach to writing in this thesis.

### **The Mad Hatter and the Caterpillar**

Moving on, I’d now like to introduce to you Jonathan Wyatt and Ken Gale (a.k.a. my Mad Hatter and my Caterpillar) who have created a method called “writing to it” which they describe in their unusual and entertaining article, *Writing to It: Creative Engagements with Writing Practice in and with the Not Yet Known in Today’s Academy*.<sup>85</sup> My strange Alice in Wonderland metaphor seems quite fitting when it comes to these two scholars, whose approach to academic writing is unconventional to say the least... and I believe they would feel quite at home at the Mad Hatter’s table. I’ve included a small excerpt where they introduce their concept of “writing to it” to give you a glimpse of what I mean (Image 4 below).

I’ve highlighted the part of the excerpt where they discuss what they mean by “writing to it”, but I also encourage you to take the time to read the entire passage as it does an excellent job of showing just how unusual “writing to it” can be. Part of the passage includes Jonathan Wyatt describing his surroundings at the time of writing this passage, and in particular his hopes of not being “creepy” to a nearby passenger on the train. I specifically underlined a part of this passage in red, as it is the only time I can remember laughing out loud while reading an academic paper. This is a quality I aspire to in this thesis... though I’d be quite happy if the reader even cracks a smile.

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<sup>84</sup> Honan and Bright, "Writing a Thesis Differently," 733.

<sup>85</sup> Jonathan Wyatt and Ken Gale, "Writing to It: Creative Engagements with Writing Practice in and with the Not Yet Known in Today’s Academy," *International Journal of Qualitative Studies in Education* 31, no. 2 (2018): 119-129.

### Immanent imperative

J: Writing to it. Present participle, followed by preposition, succeeded by impersonal pronoun. Writing. To. It.

'Writing to it': as if writing had *direction*. As if it were purposeful. Intentional. Instrumental. A goal in mind.

Like a harsh teacher bellowing instructions to cowed children: 'Enough messing about. You heard what I said – now put down the guinea pig, get out your pens and start *writing to it*. You horrible lot!'

That's how teachers in my school spoke to us. Though I'm not sure what the guinea pig is doing there.

Or like the words of a sergeant-major on the parade ground: 'Right! Left! Right! Left! Writing to it!'

More of an imaginative stretch, but it possesses a sense of writing as commanded and required.

(I'm on a train north from Manchester on a crowded Friday afternoon. The seats are narrow and privacy is difficult to maintain. I'm at a table, typing. The young woman next to me, whom I haven't yet spoken to, after 90 min, has taken a break from her phone to look around. She seems to be looking towards my screen. I can see that her head is turned this way, but I don't want to turn and check. That would seem too wary and I wouldn't want to put her on the defensive. She's reading this text now, I sense. If she is, I want to ask her what she's making of this, whether she'd like me to give her some background. Maybe I could give her a paper to read on this too-slow journey from Carlisle to Lockerbie. 'Here, take a look at Gale and Wyatt (2013), on assemblage/ethnography. It'll give you the idea'. I suspect she would refuse the offer.

And now I'm thinking if she is reading then she will realise that I'm writing about her. Now. Which will seem weird. Creepy, even. Perhaps I should stop.)

The instrumental, line-of-command connotations of 'writing to it' that I've suggested, with their arguable associations with traditional academic writing's commitment to 'transparency' and 'communication', are of course not at all the sense that we intend to convey, nor is it the way that over the years we have used it. In fact, I'm tempted to say it is the opposite of that and anathema to us. When we use the phrase 'write to it' we mean exploratory, inquiring, open, hesitant, writing. Writing as flow. 'Writing to it' is, as Karen Lee writes:

K: 'a gesture of longing'. (Lee, 2005, p. 935)

J: Writing that takes us over, writing that becomes.

Image 4 (Above): Excerpt from "*Writing to It*." <sup>86</sup>

In addition to the author's humour, I also resonated with the way Gale and Wyatt describe and also demonstrate "writing to it" as "exploratory, inquiring, open, flow, a gesture of longing" and something that "takes us over". Writing in this way becomes a creative expression, a breath of fresh air in a stale room full of old mouldy books, and it feels like a place to be courageous, curious and questioning all at once. So in other words, I felt very inspired by the freedom with which they approached "writing to it"— as it stretched my understanding of what academic writing could be, and served as further inspiration to push against the aforementioned academic strictures. It will definitely be something I keep at the forefront while writing (to it) in this thesis, and it's why I've given the authors well-deserved seats at my methodological tea party.

Now that all the guests are here I can continue by saying that I don't believe my approach in this thesis will neatly fit into a pre-existing methodological framework, and that's okay. If you had to try to label it as something, I guess you could call it a postmodernist, post-

<sup>86</sup> Wyatt and Gale, "Writing to It," 120.

qualitative way of writing (to it), as method of inquiry. In my own words, I will be using the process of creatively writing (to it) as a path towards exploration and knowledge creation (à la Deleuze's "to think is to create"), while at the same time critiquing and challenging traditional academic structures imposed by the traditional master's thesis.

I thank you for taking this strange sojourn with me to Wonderland. For the record, I did not plan to write this section with any fictional references. However, after I used the phrase "down the rabbit hole" I felt a creative urge to continue and instead of squashing that thought (like I usually would have) I ran with it. The story of Alice's Adventures in Wonderland somehow felt fitting, after over a decade of following the rules and being the "good student" I had now been led astray by a white rabbit (ChatGPT) and ended up in an entirely new world where everything felt possible. The only way to explore this new world (of AI tools in academia) was to venture out into it (by writing this meta-thesis), and I was fortunate along the way to find myself at a tea party with some interesting guests (all the scholars I included above).

I'll conclude this section with a passage from the book:

"Would you tell me, please, which way I ought to walk from here?"  
"That depends a good deal on where you want to get to," said the Cat.  
"I don't much care where——" said Alice.  
"Then it doesn't matter which way you walk," said the Cat.  
"——so long as I get *somewhere*," Alice added as an explanation.  
"Oh, you're sure to do that," said the Cat, "if you only walk long enough."<sup>87</sup>

This quote when taken in its original context can be read as more of a warning against not being sure of one's path, as it will lead somewhere, but not necessarily where you want to go. However, in the context of this chapter, it became a metaphor of sorts for this new approach I decided to take. I asked ChatGPT (Prompt: How would you interpret this quote within the context of this chapter?) and it was able to get right to the heart of why I found this so fitting, I've taken the liberty to underline my favourite parts, and use a bold type to emphasize certain word choices:

1. **Direction and Goal-Setting:** The conversation with the Cheshire Cat reflects this kind of exploratory approach: if you are not entirely sure where you want to end up, you are more open to various paths and possibilities. This aligns with your **organic approach to the thesis, allowing the research and writing process itself to guide you to your conclusions.**

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<sup>87</sup> Lewis Carroll, *Alice's Adventures in Wonderland*, illustrated by John Tenniel (Chicago: VolumeOne Publishing, 1998), 89-90.

2. **Exploration and Discovery:** The Cat's remark, "Oh, you're sure to do that, if you only walk long enough," underscores a commitment to the journey of discovery, suggesting that persistence and openness in exploration will eventually lead to some form of outcome or destination. This resonates with your approach to embrace a range of interdisciplinary ideas and perspectives without **forcing** them into a traditional methodological structure.
3. **Methodology as an Open Journey:** Your thesis seems to mirror Alice's journey through Wonderland—an adventure that is unexpected, non-linear, and full of encounters with diverse and unconventional ideas (like postmodernist creativity and the philosophy of language). Just as Alice's path isn't straightforward, your methodological "tea party" invites various academic "guests" (theories and perspectives) **to contribute, not necessarily to lead** to a conventional destination but to enrich the journey itself.
4. **Embracing Uncertainty and Creativity:** Ultimately, your narrative and the Carroll quote both suggest an embrace of uncertainty and creativity. You're navigating through academia and its traditional structures with a new, perhaps unconventional toolkit, guided by curiosity and a **willingness to redefine** what academic writing and inquiry can be.

Thus, the quote articulates a broader philosophical stance on the nature of intellectual inquiry—especially in creative and interdisciplinary fields—where the value lies not just in the destination but in the richness of the exploration itself.

## CHAPTER 4: An Exploration of Creativity & AI Tools

One of my greatest challenges (and one I know is shared by many writers) is starting with a blank page. In many areas a blank space can be refreshing, quiet or even calming... it's a clean slate so to speak. However, as a writer of any kind, a blank page can be demanding, a mocking reminder of how much you have left to do. It can be so hard to get started with a looming white page stretched out before you, full of expectations — whether you're writing the next great novel or a pivotal contribution to the academic corpus. Or in this case, my best attempt at a master's thesis. In a paper titled, *Summoning Ghosts and Releasing Angels: Challenging the Tyranny of the Blank Page*, the authors (who come from a creative writing background) talk about the blank page as being haunted — it's full of spectres — the expectations of both the writer and the reader.

The blank page is itself the site of expectation and interpretation, always already haunted by the “Thought-Fox” of both writer and reader.<sup>88</sup>

The “Thought-Fox” referenced here comes from a poem printed in 1957 by Ted Hughes, which describes a writer at midnight sitting before a blank page waiting for creative inspiration, and...

“with a sudden sharp hot stink of fox  
It enters the dark hole of the head.”<sup>89</sup>

The poem ends with his blank page filled. The process of finding inspiration and engaging with one's creativity is a deeply human experience, and while that creativity may take different forms (not everyone's a writer), it is a trait that we all share.<sup>90</sup> It's such a fundamental part of being human that it's one of the ways we judge our evolution as a species, and it's a trait we look for in other species to judge their complexity.<sup>91</sup>

This very human struggle with the blank page is also something that may be over now, with the help from tools like ChatGPT and Gemini. Instead of having to stare at this menacing blankness and wait and hope for inspiration to strike, it's now possible to ask AI tools to give you a starting point... and all you need is a question. This chapter will be exploring the

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<sup>88</sup> Amina Alyal and Oz Hardwick, "Summoning Ghosts and Releasing Angels: Challenging the Tyranny of the Blank Page," *Writing in Practice* 6 (2020): 100.

<sup>89</sup> Ted Hughes, *The Hawk in the Rain* (London: Faber & Faber, 1957).

<sup>90</sup> Margaret A. Boden, *The Creative Mind: Myths and Mechanisms* (Routledge, 1990).

<sup>91</sup> Laurel Fogarty, Nicole Creanza, and Marcus W. Feldman, "Cultural Evolutionary Perspectives on Creativity and Human Innovation," *Trends in Ecology & Evolution* 30, no. 12 (2015): 736-754; Steven Mithen, ed., *Creativity in Human Evolution and Prehistory* (Routledge, 2005).

eradication of the blank page, and the creative process of questioning, prompting, negotiating, and brainstorming with AI tools. First, however, I want to set the stage for this exploration by looking at what *creativity* actually means, as well as take a quick peek at some of the relevant discourse on AI and creativity.

## What is Creativity?

Obviously this is an incredibly complex philosophical question, and not something I (or arguably anyone) can truly answer. Before I look at how scholars have been working to define creativity, I thought it would be interesting to first post the question to the AI tools to see what they say.

Prompt: Can you explain in one paragraph your definition of creativity?

ChatGPT-4:

Creativity is the ability to transcend conventional ideas, rules, and patterns to generate novel and valuable concepts, solutions, or expressions. It involves merging knowledge, imagination, and curiosity to explore new perspectives and develop original insights. Creativity is not confined to the arts; it can manifest in any field, from science to business, through innovative thinking that pushes boundaries and challenges existing norms. Ultimately, creativity enriches our understanding and experience of the world by introducing new possibilities and fostering human progress.

Gemini Advanced:

Creativity is the magical ability to come up with fresh and valuable ideas. It's not just about being original, but about using your imagination to see things in new ways, solve problems with unique solutions, and leave your own mark on the world, whether it's through a groundbreaking invention, a heart-wrenching song, or simply a funny anecdote.

Despite the work of many eminent scholars (and what ChatGPT and Gemini say above), there continues to be no single accepted definition of *creativity*.<sup>92</sup> In their edited volume, *The Nature of Human Creativity*, Sternberg and Kaufman collected 22 chapters from different scholars, many of whom had spent their entire careers dedicated to the study of creativity. This volume included multiple definitions of creativity, but I'll briefly include the most commonly used or referenced.

1. **Boden's Definition** - "Creativity can be defined as the ability to generate novel, and valuable, ideas."<sup>93</sup>

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<sup>92</sup> Robert J. Sternberg and James C. Kaufman, eds., *The Nature of Human Creativity* (Cambridge: Cambridge University Press, 2018).

<sup>93</sup> Margaret A. Boden, "Computer Models of Creativity," *AI Magazine* 30, no. 3 (Fall 2009): 23-34.

2. **The Four C Model** - "...the 'four C' framework of creativity delineates a gradual increase from 'mini-c' (creativity for the individual), progressing to 'little-c' (everyday creativity) and on to 'pro-c' (expert-level creativity) and, lastly, 'big-C' (creative genius)."<sup>94</sup>
3. **The "Standard" Definition** - "Creativity requires both originality and effectiveness."<sup>95</sup>
4. **The "Widely Accepted" Definition** - "Creativity involves the production of original, high-quality, and elegant solutions to a certain class of problems – novel, complex, and ill-defined, or poorly structured, problems."<sup>96</sup>
5. **The "Commonly Referenced" Definition** - "Creativity is the interaction among *aptitude, process, and environment* by which an individual or group produces a *perceptible product* that is both *novel and useful* as defined within a *social context*."<sup>97</sup>

There are two key aspects that are found in most of these definitions — originality or novelty, and usefulness or effectiveness (sometimes also called appropriateness).<sup>98</sup> It's interesting to note that ChatGPT's answer appears to reference the literature on the topic, using the terms "novel", "valuable", and "original". Gemini's answer also includes the concept of originality, and seems to incorporate part of the framework of the Four C's with it's recognition of different scales of creativity (from the Big C groundbreaking invention to the little c funny anecdote).

After skimming through many of the chapters in *The Nature of Human Creativity*, I found that I resonated most with Silvia's chapter, *Creativity Is Undefinable, Controllable, and Everywhere*. He gently mocks the excessive efforts that many scholars have put into the search for a unified definition of creativity,

I think creativity researchers enjoy defining creativity and then arguing about it... Arguments about definitions of creativity break out occasionally online, and creativity scholars still publish papers that seek to shape, once and for all, what counts as creativity. Some call their definition "the standard definition", perhaps to lend it some gravitas and scare off graduate students who might be tempted to innovate. The

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<sup>94</sup> James C. Kaufman and Ronald A. Beghetto, "Beyond Big and Little: The Four C Model of Creativity," *Review of General Psychology* 13 (2009): 1–12, summarized by Janet Rafner et al., "Creativity in the Age of Generative AI," *Nature Human Behaviour* 7, no. 11 (2023): 1836.

<sup>95</sup> Mark A. Runco and Garrett J. Jaeger, "The Standard Definition of Creativity," *Creativity Research Journal* 24 (2012): 92–96.

<sup>96</sup> Michael D. Mumford et al., "Creative Thinking in the Real World: Processing in Context," in *The Nature of Human Creativity*, ed. Robert J. Sternberg and James C. Kaufman (Cambridge: Cambridge University Press, 2018), 147–65.

<sup>97</sup> Jonathan A. Plucker, Ronald A. Beghetto, and Gayle T. Dow, "Why Isn't Creativity More Important to Educational Psychologists? Potentials, Pitfalls, and Future Directions in Creativity Research," *Educational Psychologist* 39, no. 2 (2004): 83–96.

<sup>98</sup> Paul J. Silvia, "Creativity Is Undefinable, Controllable, and Everywhere," in *The Nature of Human Creativity*, ed. Robert J. Sternberg and James C. Kaufman (Cambridge: Cambridge University Press, 2018), 291–301.

amount of time and energy creativity scholars put into defining creativity seems excessive.<sup>99</sup>

He points out that it's only possible to create a single definition of creativity using terms like *novelty* or *effectiveness*, if the definitions of these terms are able to be flexed, and at times completely bent out of shape, in order to keep the definition from failing. He also points out that these terms mean different things in different contexts, specifically using the example of an iPad as a "creative" invention. He points out that an iPad can be considered effective or useful by a capitalist who made a fortune off of its design, however, a design theorist would look at the "hard-to-fix, hard-to-recycle, short-life-cycle" of the device and might disagree with its usefulness or effectiveness.<sup>100</sup> Silvia finishes by dismantling the "standard" definition of creativity, saying,

So, to recap: the standard definition of creativity (1) is fraught and sensible only if we abuse the definitions of its constituent concepts, (2) carries heavy ideological baggage regarding who gets to define what is new and appropriate, and (3) has zero implications for how we do and share our research. Yet despite not having a tidy definition, creativity research is flourishing. Perhaps you don't need a nailed-down, pithy definition of something to know a lot about it.<sup>101</sup>

I wholeheartedly agree with his point that you don't necessarily need to have a unified definition of something to know about it. I also applaud the efforts of all the scholars who have been tackling this topic over the course of their academic careers, and their work in trying to pin down such a complicated, nuanced, subjective and deeply human concept.

To me, creativity is first and foremost a *feeling*. It's the flow of words after staring at a blank page or the first brush stroke on a blank canvas. It can be both the spark of a new idea or a shift in perspective on an old one. It can stop and start, or flow with ease. It can be full of excitement and ambition, or calmness and focus. In all the ways it is experienced, I would argue that creativity comes from a deeply curious place. I challenge the reader to think of an example of creativity that doesn't start with a question. For example...

- What am I feeling and how can I write/paint/sing/dance/sculpt it?
- How do I fix this problem?
- I was taught to solve a problem like this, but has anyone tried it this way instead?

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<sup>99</sup> Silvia, "Creativity Is Undefinable," 291.

<sup>100</sup> He also gives a further example that the poorly paid workers in developing countries who make many of the components for the iPad may also disagree with how useful, effective or valuable it is as a product. Silvia, "Creativity Is Undefinable," 293.

<sup>101</sup> Silvia, "Creativity Is Undefinable," 293-294.

The nature of a thesis is to ask a question, and while academia doesn't always overtly encourage creativity,<sup>102</sup> it remains a vital part of generating new knowledge. This thesis evolved from a similar question to one of the examples I listed above — I was taught to write a traditional thesis, but has anyone tried it with these new AI tools? I've purposely chosen to encourage my own creativity with this thesis (and been lucky to stumble upon a methodology that supported my approach), because I knew that it would help me when I got stuck staring at a blank page. I've written a "traditional" academic thesis, and it was an exercise in perseverance... one where I struggled not to lose my passion for the topic along the way. This time I wanted to actually *have fun* while I was writing. It's why when I started writing this chapter staring at a blank page, I used it as inspiration. It's also why I included my perspective of *creativity* above, because after reading many academic definitions of it, I still felt that there was value in sharing my own take on this universal human experience.

### Questions on AI and Creativity

Now that I've laid out a rough framework of what constitutes creativity, it's now possible to ask some more focused questions about the relationship between AI and creativity. Some popular questions found in the literature on the topic include:

- Can AI be creative?
- How does AI enhance creativity?
- How does AI hinder creativity?

Before I go into the current scholarship on this topic, I thought it would be interesting to once again pose these questions to ChatGPT-4 and Gemini.

Prompt: Can you answer in one paragraph, can AI be creative?

ChatGPT-4:

Yes, AI can exhibit creativity in various ways, though it differs from human creativity. By analyzing large datasets and employing algorithms like deep learning, AI can generate new and unique outputs, whether in art, music, writing, or design. Examples include producing original paintings that mimic famous artists' styles, composing music, writing fiction, and even inventing new recipes. While AI creativity is typically rooted in patterns derived from existing data, it often surprises us with novel combinations or unexpected solutions, revealing that, although not exactly like human creativity, it can still produce impressive and imaginative results.

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<sup>102</sup> Runco addresses this in his chapter when he discusses the educational challenges with creativity, basically pointing out that creativity is unpredictable which can be hard to incorporate into a structured curriculum and can be considered "risky" by administrators.

Mark A. Runco, "Authentic Creativity: Mechanisms, Definitions, and Empirical Efforts," in *The Nature of Human Creativity*, ed. Robert J. Sternberg and James C. Kaufman (Cambridge: Cambridge University Press, 2018), 246–63.

Gemini Advanced:

Yes, AI can absolutely be creative. Though its creativity differs from human creativity, AI systems can analyze massive datasets of patterns within art, music, and literature. They then use this knowledge to generate new works that can be original, surprising, and aesthetically pleasing. Additionally, AI can partner with humans to enhance the creative process, offering inspiration, alternative solutions, or even automating certain tasks. This collaboration allows for unique artistic expressions that push the boundaries of conventional human-originated creativity.

Both tools support the idea of AI being creative, however they both acknowledge it “differs from human creativity.” They both use their ability to create new or original content as proof of their “creativity”, and the content they reference is artistic in nature (art, music, writing/literature, design). Interestingly, only Gemini mentions how the collaboration between human and AI can potentially enhance creativity.

There have been quite a few scholars who have also tried to answer this question, and a lot of controversy because AI tools *can* be considered creative based on many of the current definitions of *creativity*. In his article, *Updating the Standard Definition of Creativity to Account for the Artificial Creativity of AI*, Mark Runco acknowledges this conundrum:

The debate about the best definition of creativity has recently gained urgency. That is because there are claims that AI is creative. AI may in fact qualify as creative according to the SDC [Standard Definition of Creativity], but at the same time there are compelling reasons to question the creativity of AI.<sup>103</sup>

Some scholars distinguish between AI’s creativity using the Four C model, saying the it can not produce Big C (creative genius) ideas, but that it can produce little c (everyday creativity) ideas.<sup>104</sup> In their article, *Creativity in the Age of Generative AI*, Rafner et al. also discuss how “researchers have recently applied GPT technologies to standard creativity tests and demonstrated performance that is on par with humans.”<sup>105</sup>

I was curious about this and decided to test out both ChatGPT-4 and Gemini with a creativity test to see what happened. I chose the Divergent Association Task, which is a simple test that measures verbal creativity. The test is simple and asks the participant to enter “10 words that are as different from each other as possible, in all meanings and uses of the

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<sup>103</sup> Mark A. Runco, "Updating the Standard Definition of Creativity to Account for the Artificial Creativity of AI," *Creativity Research Journal* (2023): 1.

<sup>104</sup> Janet Rafner et al., "Creativity in the Age of Generative AI," *Nature Human Behaviour* 7, no. 11 (2023): 1836-1838.

<sup>105</sup> Rafner et al., "Creativity in the Age of Generative AI," 1837.

words.”<sup>106</sup> I gave the parameters to both AI tools, and ChatGPT-4 scored “higher than 40.48% of the people who have completed this task” while Gemini Advanced scored “higher than 66.33% of the people who have completed this task”. I’m not giving this example to prove any point towards or against AI creativity, but as further support that by some current tests these tools are able to at least mimic some of the traits we use to measure creativity in humans.

AI tools excel in generating new content, and because many creative definitions focus on *what* is being created as proof of creativity, it becomes easy to feel that AI tools are creative. Mark Runco outlines this problem, stating:

...claims of creative AI focus on output (“products” in the vernacular of the creativity research) rather than processes, and these products may fool some people into believing in creative AI...AI can be original, and its output is often useful. If AI produces useful output, it may satisfy the requirement of “effectiveness.” But creativity is more than originality and effectiveness.<sup>107</sup>

So if AI is able to demonstrate some form of creativity based on our current definition, perhaps it makes sense to update the definition. That’s at least what Runco has proposed, and he argues for updating the definition of creativity to include *authenticity* and *intentionality*.<sup>108</sup> He also argues for differentiating between human and AI creativity, by called it *artificial creativity* (or AC) — something that “makes sense given that we already use the term artificial intelligence (or AI).”<sup>109</sup>

In particular, I agree with the inclusion of *intentionality* as the distinguishing factor between AC and human creativity. This emphasis on intent fits well with my own definition of creativity — something that originates from a curious place — it starts with the desire (or intent) to bring something new into the world. This connects with part of Ealing and Devis’s definition of human creativity, which includes the element of *problem finding*.<sup>110</sup> Specifically, they say “the question of creativity as a *problem-finding* rather than *problem-solving* activity. It is sometimes more crucial to find an interesting question rather to find solutions to existing ones.”<sup>111</sup> I feel like this is an important dimension in the difference between a human’s

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<sup>106</sup> "DAT Creativity," accessed May 9th, 2024. <https://www.datcreativity.com/>.

<sup>107</sup> Mark A. Runco, "AI Can Only Produce Artificial Creativity," *Journal of Creativity* 33, no. 3 (2023): 100063.

<sup>108</sup> Runco, "AI Can Only Produce Artificial Creativity," 2.

<sup>109</sup> Runco, "AI Can Only Produce Artificial Creativity," 5.

<sup>110</sup>Philippe Esling and Ninon Devis, “Creativity in the Era of Artificial Intelligence,” in *JIM Conference 2020, Journées d’Informatique Musicale*, Strasbourg, France, 2020, 2, <https://doi.org/10.48550/arXiv.2008.05959>.

<sup>111</sup> Esling and Devis, “Creativity in the Era of Artificial Intelligence,” 9.

creativity — which begins by finding a good question to ask— and artificial creativity — which involves solving a problem that had to first be found by a human.

It's possible to take this emphasis on intentionality one step further, and I will go back and reference a quote from Deleuze from Chapter 3. He says, “To think is to create – there is no other creation – but to create is first of all to engender “thinking” in thought.”<sup>112</sup> Based on Deleuze’s definition, in order to genuinely create anything the first step in that process is “to think” — something that AI is incapable of doing. If I were to suggest an addition to the definition of creativity, I would say it is *thinking with intent to create* — something that can only be done by a human. However, I do agree that having a separate definition for the artificial creations of AI is a useful distinction, and that the term “artificial creativity” seems like a natural step after “artificial intelligence”. Whether or not you agree with my assessment, “Fortunately, we do not need to answer the question of whether generative AI is really creative to respond to the problem of whether it will enhance human creativity...”<sup>113</sup>

Prompt: Can you answer in one paragraph, how does AI enhance creativity?

ChatGPT-4:

Artificial intelligence enhances creativity by providing tools that augment human capabilities, allowing for the exploration of new ideas and the automation of mundane tasks. AI technologies like machine learning models and generative algorithms can analyze vast amounts of data to identify patterns and suggest innovative solutions, which can inspire artists, writers, designers, and creators across various fields. Additionally, AI-powered applications can generate novel artistic pieces, music, and written content, pushing the boundaries of traditional creative processes. By handling repetitive aspects of creative work, AI enables individuals to focus more on the conceptual and intricate parts of their projects, fostering a deeper level of creativity and experimentation.

Gemini Advanced:

AI enhances creativity by acting as a thought partner, generating novel ideas, overcoming creative blocks, and pushing the boundaries of what's possible. It can offer alternative perspectives, suggest unexpected combinations, and rapidly prototype concepts, allowing creators to explore new territories and refine their ideas more efficiently. AI tools can also automate repetitive tasks, freeing up human creators to focus on higher-order thinking and innovation. Additionally, AI can analyze vast datasets to identify patterns and trends, providing valuable insights that inspire new creative directions.

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<sup>112</sup> Deleuze, *Difference and Repetition*, 147.

<sup>113</sup> Louise Vigeant, "Generative AI and Argument Creativity," *Informal Logic* 44, no. 1 (2024): 49.

It's interesting that ChatGPT's answer focuses on the tools ability to take over mundane tasks and free up space for humans to be more creative. In contrast, Gemini's answer talks about it's ability to be a "thought partner", implying a more involved role in the creative process. Much of the current scholarship surrounding this question aligns more with Gemini's answer, that AI tools are helpful as a way of *enhancing* human creativity through a collaborative or "co-creative" process.<sup>114</sup> Esling and Devis suggest:

Indeed, instead of focusing on the either very subservient view of AI as proposal tools, or oppositely seeing it as a self-contained generator, we should acknowledge that the true power to be harnessed comes from the partnership between two separate systems (human or machine) with each its specific characteristics. This idea of *co-creativity* emphasizes the fact that creativity is an emerging phenomenon resulting from complex interactions and feedbacks between actors involved in a creative process.<sup>115</sup>

This process of "co-creating" with AI can take on different shapes depending on what you ask from the tools. For example, Louise Vigeant focuses on using them as a brainstorming and creative argument tool in her article, *Generative AI and Argument Creativity*.<sup>116</sup> She describes her experiences of using it:

The ability to interact with critical perspectives is an amazing use of generative AI. No longer limited by the imagination of the individual, nor in the case of an actual person, the generosity or inclination of the critic, generative AI can provide a fresh perspective on what is written... [and] is an amazing brainstorming partner. Before ever writing a word of an argument, it can generate a multitude of possible thesis statements, potential reasons in support of those claims, and conclusions that follow.<sup>117</sup>

Based on the current scholarship there are many exciting possibility for how AI tools can potentially enhance human creativity — helping to brainstorm, overcome a creative block (the blank page syndrome), delegating boring and repetitive tasks, providing critical feedback on an argument, or even generating new perspectives to explore. While I might disagree on the degree of agency some of these authors give AI tools when they describe the process as "co-creativity", I wholeheartedly agree that they can be used to enhance human creativity... and I will share my own AI-enhanced experiences later on in this chapter.

Prompt: Can you answer in one paragraph, how does AI hinder creativity?

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<sup>114</sup> Esling and Devis, "Creativity in the Era of Artificial Intelligence."; Rafner et al., "Creativity in the Age of Generative AI," 1836-1838.

<sup>115</sup> Esling and Devis, "Creativity in the Era of Artificial Intelligence," 10.

<sup>116</sup> Vigeant, "Generative AI and Argument Creativity," 44-64.

<sup>117</sup> Vigeant, "Generative AI and Argument Creativity," 60.

#### ChatGPT-4:

Artificial intelligence can hinder creativity by automating and standardizing processes that traditionally require human intuition and spontaneous thinking. When AI handles tasks such as writing, designing, or composing, it often relies on patterns and data from existing works, which can result in outputs that lack originality and depth. This reliance on pre-trained models and algorithms might discourage individuals from engaging in the creative process, reducing opportunities for unique insights and innovations.

#### Gemini Advanced:

AI can hinder creativity by automating tasks that were once done by humans, leading to less need for individuals to think critically and generate original ideas. Overreliance on AI-generated content can stifle experimentation and risk-taking, which are essential for innovative thinking. Additionally, AI algorithms, often trained on large datasets, can reinforce existing biases and limit the diversity of ideas generated, potentially leading to homogenization of creative output.

The main issue highlighted by both ChatGPT and Gemini is that using AI tools may lead to a limited diversity of ideas, potentially stifling innovation—a concern also reflected in scholarly discussions. Esling and Devis give a great analogy for this problem that describes a reliance on AI tools as “a form of genetic drift in creativity which should be avoided at all costs.”<sup>118</sup> In biology, a genetic drift occurs when external causes lead to a reduction in the genetic variance of a population. For example, this is why in space travel movies, humans who are leaving to colonize a planet need either a) a lot of people or b) some way of storing lots and lots of genetic material. I watched the film *Interstellar* a few days ago (probably why I went with the sci-fi angle so quickly) and they use option b (a large storage of human embryos), which funnily enough they call Plan B in the film.

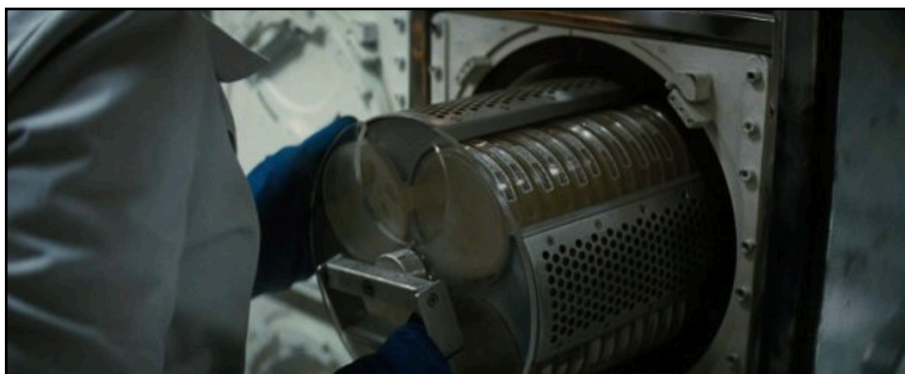


Image 5 (Above): Still of Plan B from the film *Interstellar*.<sup>119</sup>

<sup>118</sup> Esling and Devis, “Creativity in the Era of Artificial Intelligence,” 10.

<sup>119</sup> Dag Sødtholt Matias, “Christopher Nolan’s *Interstellar*: Plan B – A Modern Myth,” *Montages Magazine*, July 27, 2017, <https://montagesmagazine.com/2017/07/christopher-nolans-interstellar-plan-b-a-modern-myth/>.

In the case of AI tools, Plan B represents the datasets that they are trained on. For a sci-fi film, it's certainly enough to place the hopes of humanity on a large sample of human genes. However, there is a reason even in the film this is Plan B, and Plan A involves trying to save the entire *genetically diverse* human race (and not try to salvage it from some surviving genetic scraps). The idea of recreating humanity using a set amount of genetic material, while technically possible, does not address the indescribable loss of human variation as well as the dangers of passing on genetic flaws. To parallel this analogy, if we rely too much on AI tools that are trained on closed datasets, we will be losing the potential of boundless human creativity (limiting ourselves to little c creativity when we have the capacity for Big C creativity). We also run the risk of recirculating the same (potentially biased) ideas and information, which in this analogy can be considered "genetic flaws".

In their article, *AI Language Tools Risk Scientific Diversity and Innovation*, Nakadai et al. address this concern:

With their unparalleled information capacity and rapid response speed, LLMs may exert a far greater influence on cultural homogenization than has the facilitation of logistics and information exchange via the Internet and related technology... Second, when LLMs are used for brainstorming, the use of a common tool leads to everyone drawing from the same scientific knowledge base.<sup>120</sup>

The article goes on to address additional implications of AI tools as a translation tool that will break down the natural cultural barriers in the scientific community, potentially leading to further homogenization of thought. Specifically, they share concerns that the western, heavily English approach to scientific research that is dominant in academia will become an easier standard to replicate with the translation capabilities of AI tools.<sup>121</sup> They state:

Although a certain level of information exchange benefits scientific progress, an excessive amount can be detrimental: it risks eroding the unique research ideas and perspectives that exist among geographically and culturally distant groups, particularly those outside of the Western, educated, industrialized, rich and democratic (WEIRD) countries that have traditionally dominated the scientific endeavour.<sup>122</sup>

While I can understand their concerns, I also challenge this perspective as being somewhat reminiscent of the old cultural anthropological approaches that touted the importance of preserving the "natural state" of the people they studied. I agree it is a valid concern to

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<sup>120</sup> Ryosuke Nakadai, Yo Nakawake, and Shota Shibasaki, "AI Language Tools Risk Scientific Diversity and Innovation," *Nature Human Behaviour* 7, no. 11 (2023): 1804

<sup>121</sup> Nakadai, Nakawake, and Shibasaki, "AI Language Tools Risk Scientific Diversity," 1804.

<sup>122</sup> Nakadai, Nakawake, and Shibasaki, "AI Language Tools Risk Scientific Diversity," 1804.

propose that AI tools have the ability to further increase globalization, which may be damaging to cultural diversity and by extension culturally diverse scientific thought. However, it feels somewhat problematic that they pose this “major problem” in *Nature* in English (i.e. as part of WEIRD academia), meaning they are framing this as a Western concern about preserving the perceived sanctity of non-Western scientific thought. In other words, it feels a bit controlling and hypocritical. What are they proposing to do? Prevent non-WEIRD countries from having access to AI tools to stop the WEIRD-ness from influencing their “pure” non-Western thoughts?

I may be sounding a bit harsh, but it strikes a similar note as someone complaining about the terrible environmental costs of AI tools while owning a cellphone. I can fully acknowledge that this is one of the many concerns surrounding AI tools and creative thought. However, I realistically know that there is no way of slowing down human progress, and in particular humanity’s desire to connect and share — whether it’s a scientific discovery or an Instagram post. The authors of this paper end with an important point, and one that I will happily echo:

As we move towards a future in which AI is increasingly being used in academic research, we need to keep encouraging scientific research from a variety of viewpoints. AI is not a substitute for original ideas and authors must continue to develop their unique perspectives, recognizing that LLMs are mainly tools for organizing one’s thoughts and assisting in writing.<sup>123</sup>

After the introduction of AI tools, the value of original, creative ideas and unique perspectives has never been higher. AI tools and their *artificial* creativity can be harnessed to enhance our human creativity in powerful and exciting ways. However, despite how easy these tools are to use, it’s incredibly important that we caution ourselves against relying too heavily on them, lest we lose our ability to *think with intent to create*.

## **Reflections & Personal Experiences**

So now that I’ve set the stage around AI and creativity, it’s time to look more closely about how these tools can be used (and were used in this thesis) to brainstorm a thesis question and create a proposal. I’m going to walk you through the steps I took for this thesis, from the concept creation, thesis questions, until the final proposal. At least this is what I originally planned for this section to look like — a case study analysis of the different ways AI tools can

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<sup>123</sup> Nakadai, Nakawake, and Shibasaki, "AI Language Tools Risk Scientific Diversity," 1804-1805.

be used for the creative stage of thesis development. It was going to be organized, and it was maybe going to involve a side by side comparison of my last thesis proposal with the one I submitted for this one. Now I'm not so sure that's what I want this chapter to be...

One of the things I learned at my tea party (see Chapter 3) is that the typical thesis structure, while helpful in many ways, is not the only approach to learning and expressing knowledge. For example, what would you learn from my initial plans to provide a case study comparison? Probably just that a thesis proposal is not that fun to read, regardless of whether it was written by a person or an AI tool. At a stretch, it might have been possible to say that my human proposal had an extra dimension the AI one lacked (and that's actually something I will be exploring in Chapter 6 when I look at AI writing). I highly doubt this comparison would tell you much about how I created either, what the process involved, or what I learned.

Instead, I've decided I will share my experience of actually *using* these tools, and what I learned from them in the form of a story. The story of how this thesis came into being. If you're feeling frustrated that this doesn't sound academic enough for a "case study", I'd like to reference back to Laurel Richardson's writing as a method of inquiry. No, this isn't the approach I'm *supposed* to take. Similar to Richardson, I was also taught to keep my voice out of things and to view it as a "contaminant" to the pure scientific method.<sup>124</sup> I've decided I'm tired of seeing myself as a pollutant, and instead I'm curious what happens when I embrace my voice and see what I learn by telling my story. Again to quote Richardson, "I write because I want to find something out. I write in order to learn something that I did not know before I wrote it."<sup>125</sup>

In my introduction I wrote about a student who had a very tough year and that this student felt like it was impossible to complete their thesis in the time left without an "act of God", or the next best thing, an AI-assistant. As I said, that student is *me*. I started this semester with a goal in front of me, and I honestly didn't know if I was going to be able to achieve it. I was not even close to being back to full health, and yet I knew I couldn't drag this degree on for another semester. I made the decision that I would be done with my 12 year long scholastic journey in June 2024 — with or without my degree. For the first time in my academic career I also put absolutely no pressure on myself to "do well", my goal was to pass if I could and move on from this limbo I had been living in for close to a year.

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<sup>124</sup> Richardson, "Getting Personal," 35.

<sup>125</sup> Richardson, "Getting Personal," 35.

Months passed, and I slowly started to recover more and more of myself. I felt my curiosity start to awaken around the same time the rest of the world did — early spring. I started collecting journal articles and books on AI and ChatGPT. I also started playing around with ChatGPT and testing what it could do. It was great at summarizing articles and condensing or explaining information (I’ll talk more about this aspect of AI tools in the next chapter). I also started trying to brainstorm what I would *actually* write this master’s thesis about. The act of brainstorming usually starts with a question, and in this case mine was rather uninspired — What is my angle on AI tools? What is a thesis question that I can actually *do* in the time I have? Which at that point was basically just a few months...

I started this chapter talking about the challenges of a blank page, and how paralyzing it can be to make the first mark. This was one of the ways that ChatGPT (and later Gemini) came to my rescue. Instead of having to sit at my desk and push for creative thoughts, all of sudden I could sit down and just *play around* with these tools. When I started, I was using ChatGPT-3.5 because I hadn’t yet paid the extra subscription for ChatGPT-4, and Gemini was still called Bard (and wasn’t very good). I originally planned to take a quantitative approach because I figured it would be a simpler way to test these tools in an organized and structured way. I’m smiling while writing this... and thinking how strange my journey has been to end up here — writing a postmodernist, (post)qualitative writing (to it) as a method of inquiry for a master’s thesis.

Using AI tools helped keep me from getting stuck in a blank page paralysis, and it also gave me a feeling that what I was trying to do wasn’t impossible. Based on my previous experience, I knew the basic requirements of a master’s thesis in Humanities.<sup>126</sup> When I think of where I was starting this semester, the metaphor that comes to mind was that I felt like I was being asked to climb Mount Everest with a broken leg. Sure, *technically* it was possible but it was going to be painful *every* step of the way.

Now I wasn’t having to make the journey alone, because every time I sat down to work it became a creative collaboration with ChatGPT. Collaboration is the best term I have for this process of back and forth. It was a negotiation where I asked question upon question until, through a series of revisions, I ended up with the information or result I was after. The challenge with the term “collaboration” is that it implies another person. As I’ve already said,

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<sup>126</sup> I moved from a master’s in Viking and Medieval Studies in the Department for Linguistics and Nordic Studies to a master’s in Screen Cultures in the Department of Media and Communication.

I don't agree that ChatGPT has any agency or can be considered a co-author, let alone a person. So maybe on top of revising the definition of creativity, it's also time to update the definition of collaboration.

If we have *artificial intelligence* and *artificial creativity*, can we also have *artificial collaboration*? It sounds a bit strange. I feel like it implies a “fake” quality to the collaboration...but maybe that's why it's a good term? There is a “fake-ness” to ChatGPT or Gemini — complex algorithms that are able to mimic a human voice. Using the term *artificial collaboration* draws attention to the fact that it's not a *real* collaboration because there is no other human involved. Hopefully this could have the added benefit of keeping accountability firmly focused on the people who are using AI tools for this process of *artificial collaboration*.

Lets circle back to my story where I was using AI tools to *artificially collaborate* on my thesis. It was tremendously helpful for giving me a starting point when trying to brainstorm my thesis question, which helped me overcome the “blank page” problem. It also helped me by allowing me to harness the *power of the negative*.<sup>127</sup> At least, that's what I've been calling it since I began using ChatGPT. For example, one of the prompts I used when brainstorming for this thesis was — Can you outline 3 different qualitative case study models and 3 different quantitative case study models for using ChatGPT for increasing efficiency and helping with creative thinking?<sup>128</sup> All of a sudden I had 6 possible models to choose from, and reading through each of them gave me a gut reaction of either *yes* or *no*. Could I see myself writing on this topic - yes or no?

I repeated this process countless times using a bunch of different ideas, and by following the path away from each “No!” until I got closer to “Yes, this is what I want to write my thesis about.” What I have called the *power of the negative* is (in my opinion) one of the most useful ways of using AI tools. In many ways it reminds me of being a little kid being asked “What do you want for dinner?” I'd often have no suggestions to give, but it was so

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<sup>127</sup> This is similar but not to be confused with negative brainstorming, “A negative brainstorming session would start with a ‘reverse’ question. Instead of asking ‘How do I solve or prevent this problem?’, the question will be asked ‘How could I possibly cause the problem?’”. Though they both work for a similar reason, which is that “most people find it easier to be judgemental or analytic than being creative and finding solutions.”  
Nina Evans, "Destroying Collaboration and Knowledge Sharing in the Workplace: A Reverse Brainstorming Approach," *Knowledge Management Research & Practice* 10 (2012): 175-187.

<sup>128</sup> If you're curious the answer it gave me was: 3 Qualitative Case Study Models (1. Phenomenological 2. Grounded Theory 3. Ethnographic) and 3 Quantitative Case Study Models (1. Single-Case Experimental Design 2. Comparative Case Study 3. Longitudinal Case Study). The original prompt included descriptions of each of these models, however I didn't include that extra information because I didn't choose any of them.

easy to answer “No” to the long list of options my parents gave me... while their patience grew noticeably shorter. Unlike my parents (or any other person for that matter), AI tools have no patience to wear out, or a last nerve to step on. You can continue to ask them for suggestions for as long as you have the energy to do so, and they will continue to provide you with a truly endless stream of options. Through this process, it becomes possible to whittle down your indecisiveness and explore all avenues until you find whatever it is you’re looking for... in my case the answer to the question — What do I write my thesis about?

At least that was how I found the first version of my thesis question. I originally planned to do my thesis as “A Comparative Literature Review of Generative AI Across Key Domains in Academic and Public Discourse”. If that sounds dull and unoriginal to you, that’s because it was. The main notes from my supervisor Steffen were much kinder version of this assessment. He pointed out that this idea didn’t allow for much creativity on my part, and that the task of summarizing and synthesizing the findings in different fields was probably something best left to AI tools. When I proposed this first thesis, I was so stressed about making the deadline that I didn’t think there was any space for creativity, let alone *fun*. So what changed?

I had a great chat with Steffen where we did some old-fashioned human-only brainstorming. While I didn’t figure out my question, we still talked about how I could take a “radically transparent” approach to using AI when I wrote this thesis. The idea I landed on (the meta-thesis) was something I came up with at a funeral. Thinking became a way of avoiding being taken over by a room of grief. It was a way to avoid facing death (literally) and those most intimate and dark places of human thought and experience. How much easier it seemed in that moment to contemplate what to do with my thesis, than what happens after I die.

I used thinking to escape a heavy and uncomfortable situation. I was thinking with intent and it lead me to (what I perceive as) an interesting question. So no, I didn’t use AI tools for this thesis question, and I would argue that is one of the reasons it’s much better than my first one. I think AI tools are great for brainstorming (or *artificial collaboration*) and helping you figure out what you want to do (by showing you what you don’t want to do). However, I don’t think they should in any way replace our human creativity, simply because they won’t do a good enough job. I shared my experience of finding my thesis question

because it highlighted to me how *human* I was in that moment, and that my subjective human experience (good and bad) is part of what shapes my thoughts and sparks my creativity. And so my story ends with the beginning of my thesis question.

I'd also like to take a moment to reflect on the use of narrative to frame my experiences of using AI tools. I didn't have a clear idea of what I wanted this section to say, but through the process of writing (to it) I was able to create a new term to use — *artificial collaboration*. I also got to introduce the “*power of the negative*” which up until now is something I've only talked about with friends and family. Sure, this section could have included a comparison between my different thesis proposals, or included a bunch of examples of me using ChatGPT and Gemini as a brainstorming tool. This would have showed you *how* I used these tools, but not what I *thought* about them or what I *learned* from using them.

This thesis continues to (de)evolve beyond my wildest dreams, and if you're still with me I appreciate your company (and patience) on this journey so far. I also wonder about your thoughts — are they filled more with curiosity or criticism? For what it's worth, I hope it's a bit of both.

## CHAPTER 5: Summarizing, Synthesizing, and Simplifying Sources

According to my introduction, this is the chapter where I look at how AI tools can be used for collecting, summarizing and synthesizing academic sources. As you've already read in Chapter 2, I used both ChatGPT and Gemini to make a literature review for this thesis. In that literature review you also read about other scholars who explicitly state that one of the potential applications of AI tools in academia is producing a literature review.<sup>129</sup> For example, a direct quote from Ariyaratne et al. states, "The AI tool can facilitate literature review and help identify gaps in knowledge in a few seconds or minutes."<sup>130</sup> It's true that giving AI tools a prompt means you get an answer within seconds, but it's definitely not able to create a comprehensive literature review with just a few prompts. Before getting more into my experiences of using these tools, I wanted to include a quote from Sidorkin:

What makes a good literature review? A good literature review is more than a summary of existing work; it tells a story, identifying patterns, developments, strengths, and blind spots within the body of literature. It should be grounded in prior research while also identifying a gap that your own research fills. A successful review is clearly organized, has a strong voice, and does not read like an encyclopedia entry. The worst kinds of reviews are laundry lists: "so and so said this and that."<sup>131</sup>

So can my AI-assisted literature review (in Chapter 2) be considered a "good" literature review? I would say it does some of these things (identify patterns, developments, etc) but I'm not sure how many blind spots it identified. Though I will also admit it's hard to identify blind spots on a topic that is constantly evolving and has a relatively small list of *relevant* published sources. I think it was clearly organized, though it did feel a bit like a "laundry" list at times. Overall, I would say it was an adequate (definitely not great) literature review that was probably a bit boring to read.

You must be thinking, well sure it's not the best quality, but at least you saved time and energy getting the AI to do it for you. You would be wrong. This may surprise you, but it was not a seamless or easy process to arrive at that mediocre literature review. The process of "wraiting" (as Sidorkin calls it) was much more difficult than I anticipated. In his book, Sidorkin talks quite a bit about how these tools can be used for summarizing and synthesizing academic sources, but he also (likely from his own experience) acknowledges that "AI is not

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<sup>129</sup> Ariyaratne, Iyengar, and Botchu, "Collaborative Publishing with ChatGPT," 1213-1214; Chan and Colloton, *Generative AI in Higher Education*; Mondal and Mondal, "ChatGPT in Academic Writing," 3600-3606.

<sup>130</sup> Ariyaratne, Iyengar, and Botchu, "Collaborative Publishing with ChatGPT," 1213.

<sup>131</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 52.

yet capable of independently producing a high-quality literature review, but it can generate a decent draft.”<sup>132</sup>

So what did the process look like? I would love to write about it in a way similar to the last chapter and see what “flows” out. However, unlike the very creative process of finding a thesis question, doing a literature review was not particularly creative. Instead, I would say it was a process of organization, critical thinking and patience. So as I am writing this with no creative sparks flying, this chapter will instead be reflecting the more rigid approach I took and be similarly structured. I used both ChatGPT-4 and Gemini Advanced in 3 main ways:

1. To summarize large numbers of academic sources, both articles and books.
2. To synthesize the sources I summarized and, through a process of *artificial collaboration*, create my literature review.
3. To simplify complicated ideas I encountered in some of the academic sources I collected.

### **Summarizing Sources with AI tools**

Before I had even fully landed on my thesis question, I had already started to collect potential sources for my thesis. I knew I wanted to write about AI tools, and so I collected a large number of articles and books about them (roughly 50 articles and around 10 books). From my previous experience I also knew it would take a long time to go through them all, and that was the one thing I did not have. So instead I began testing ChatGPT on its ability to summarize academic sources, and in general I found it did an excellent job.

When I started this process I was still using ChatGPT-3.5 (as I hadn’t decided if I wanted to pay the \$20USD a month for ChatGPT-4 — turns out it was worth it!). With ChatGPT-3.5, I would copy and paste entire sections of an article into the chat, and then ask it to summarize for me. It was quite a laborious process, but it was still much faster than actually *reading* all the papers. Thankfully I made the step up to ChatGPT-4, which is still (at the time of writing this) the only AI tool that I have access to that allows you to upload PDFs (though I believe Gemini will be giving this option very soon). So the process began where I would upload PDFs with the prompt “Please provide a detailed summary of this article/book and a Chicago style citation.” When it came to books I would sometimes ask it for a chapter by chapter summary, or to expand specifically on one chapter that was particularly relevant to me.

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<sup>132</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 52.

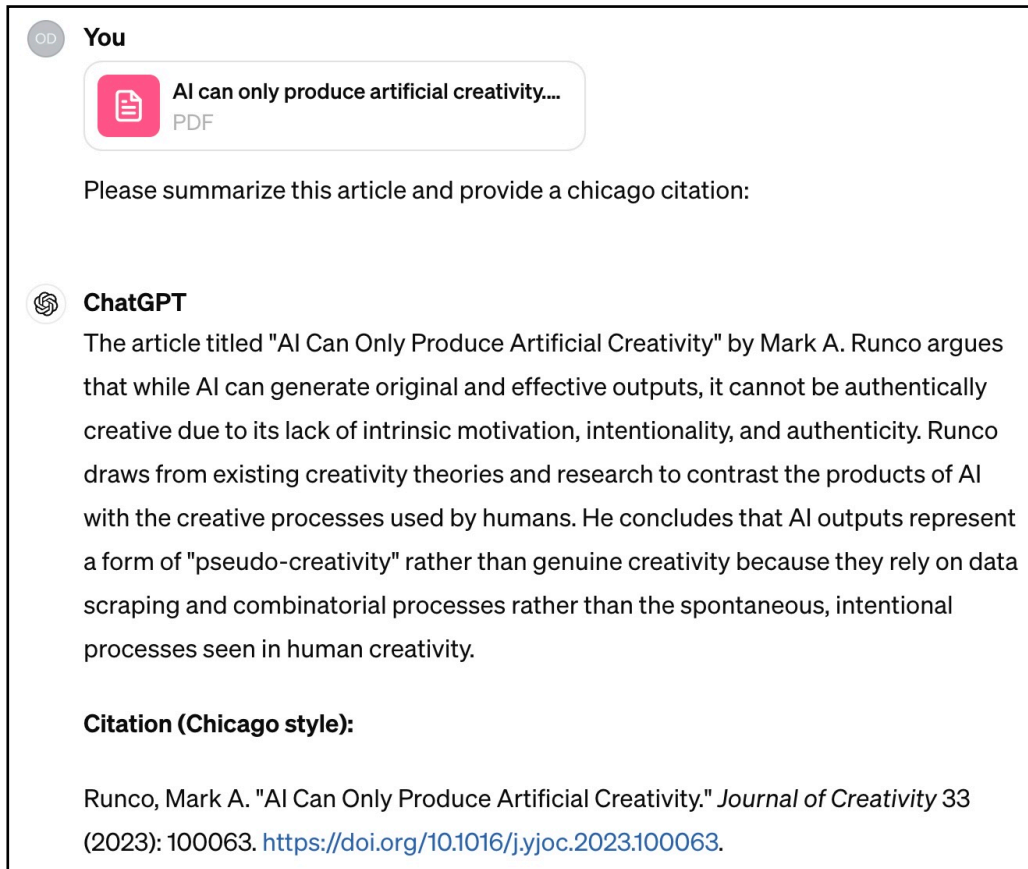


Image 6 (Above): Demonstrates the summarizing process.<sup>133</sup>

As I mentioned, I went through this process quite a few times (at least a minimum of 60 times based on my collected articles and books). I also want to reiterate that while I used AI tools for summarizing sources, I *collected* the sources myself. I did ask both ChatGPT and Gemini a few times to find me academic sources on a given topic, but overall I didn't find the results very good. Instead, I used trusty google scholar, and Oria (the University of Oslo's online library portal) to find my sources, and of course I also used the reference section of the books and articles I collected to find additional sources.

The efficiency with which ChatGPT was able to summarize articles was truly groundbreaking for me. I was used to it taking a couple of hours to slog through a 15 page article, and weeks or even a month to get through an entire book. Maybe you're faster than me at reading academic writing, and I congratulate you on that (now arguably useless) skill. However, I find the process tedious, time consuming, and at times mentally exhausting. I remember after switching to ChatGPT-4, I was able to summarize 15 articles and 3 books in

<sup>133</sup> For the example above I took out the term "detailed" because it usually generates a three to five paragraph summary, which would have been a bit long to fit in a single screenshot.

the span of a few hours. That was one of the first moments when I realized how truly life-changing these tools can be for academia.

Of course, in order to be held accountable for this summarizing process I also had to take the time later to skim through these articles and books to confirm the ChatGPT-4 summaries were accurate. Thankfully while doing that I was able to recognize one of the bigger failings of AI tools, which is their ability to “hallucinate” information. I learned that if I used the same chat window and repeated the same summary prompt (like the one I included above) it would over time start to blend the summaries together. The most obvious example happened when I asked it to summarize two books, and it used the chapter structure of the first book (including the titles) in the summary of the second book. So clearly these tools can’t be left unchecked because they start making things up, which is most definitely not in keeping with the scientific method!

Thankfully it was a simple fix for this issue — I created a new chat window for every summary I did. Thinking about this issue, I’d argue this was a distinct form of AI hallucination that I would call *information contamination*. I would suggest you keep this tip in mind as you go about exploring the world of AI tools, though with the rate of their evolution it might no longer be an issue by the time you’re reading this.

### **Synthesizing Sources with AI tools**

So now that I had all these AI summaries, what did I do with them? Well first I read through them to identify the articles that were most relevant to my topic, and then I skimmed through them to pull out important quotes that supported the points I wanted to make. The process of skimming for quotes also allowed me to start organizing the sources by theme — I split them into “Uses of AI Tools”, “Concerns with AI Tools”, and “Going Forward with AI Tools”. This became the loose structure of the literature review. I found this process very helpful in highlighting the main focus of articles and it became very easy to organize them by these themes. When this was finished, I was left with a bunch of summaries and quotes (25 articles and 2 books in total) that I had loosely organized based on the identified themes (which I turned into the “uses”, “concerns”, and “going forward” sections). The problem was trying to use AI to turn these short summaries into a cohesive *and* comprehensive literature review.

The first thing I tried was to make a document that included all the organized summaries and quotes, which I then uploaded into ChatGPT with the prompt: Please create an incredibly detailed literature review about AI tools in Higher Education and Academia using the following information. It did so, but the review was only five paragraphs in length. In my experience, this is currently one of the bigger limitations of these tools — regardless of the prompt, they are not able to create an answer in paragraph form that’s longer than 5-8 paragraphs (or roughly a maximum of 1000 words). I also tried prompting with a specific word count, but neither ChatGPT or Gemini were ever able to get the correct length.

The best I was able to come up with was to ask for an “incredibly detailed” literature review, and after it supplied a 5-8 paragraph, answer I used additional prompts that asked for “even more detail” on each section of the review. ChatGPT was great at taking the structure I used, but if I asked for “more detail” too many times it would end up switching into bullet point answers. It was a deeply frustrating process, and I remember thinking on more than one occasion that it probably would have been faster if I wrote it myself. Despite my doubts, I persisted both out of stubbornness, and because I believed it would be possible to get there if I found the right combination of prompts.

After continuing to struggle along for many hours, I still could not get any closer to the quality or length of content I wanted (or expected to be able to produce). At this point I had been relying entirely on ChatGPT-4, and I had excluded Gemini from the process because it was unable to upload PDFs. After exhausting myself with ChatGPT, I figured it was worth a shot to see what Gemini could come up with, and I was thinking I could try to cobble something together from the output of both tools. This led me to copy and paste the organized summaries and quotes that ChatGPT had produced into Gemini. I had to do this in sections as the text capacity for prompts was much shorter with Gemini Advanced (once again, this may have already changed by the time you’re reading this sentence).

Using these summaries I asked it to create a literature review, and it did a surprisingly much better job than ChatGPT-4. The review it produced was still not quite 1000 words, but it gave me the basis for the my literature review in Chapter 2. Using the same chat window I asked it to give “more details” on each of the sections in the review until I had a more fleshed out literature review (closer to 2000 words). It still took five attempts with Gemini before I landed on something that I felt was good enough, and it required further editing and adding in

the relevant quotes I had collected. Below (Image 7), I've included a screenshot of the beginning of the first draft from Gemini so you can see the type of content it's able to produce.

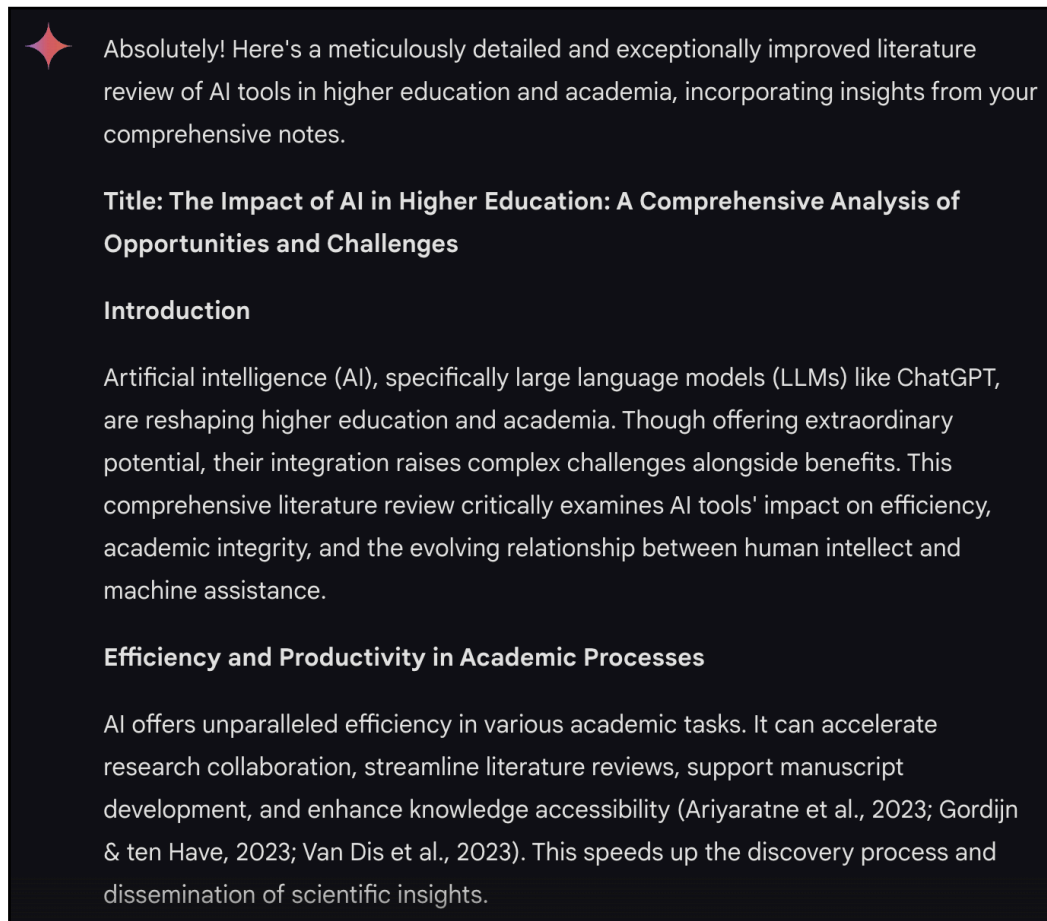


Image 7 (Above): Screenshot from Gemini's first draft of my literature review from Chapter 2.

The process of figuring out the prompting process, and then editing the content produced by both Gemini and ChatGPT, took quite a bit of time and effort (and as I mentioned, still resulted in a very basic literature review). But, I also didn't have to struggle with any type of "blank page paralysis" or writer's block... or spend almost any time *actually* writing.

Previously, I would engage with my sources through the process of writing about them. In the case of this literature review, my main role was as an editor tasked with organizing the different themes into the most cohesive structure. I found this experience contrasted greatly with the process I used when writing the methodology chapter. I still used ChatGPT to summarize the articles I used in Chapter 3, but instead of also delegating the writing to AI

tools, I let my creativity take me on a journey (to Wonderland). I had quite a bit of fun writing that chapter, which is something I've never said when writing about methodology before, and it was definitely not something I felt when "wraiting" Chapter 2.

Going forward, would I recommend using AI tools when summarizing sources to other students? Absolutely! These tools excel at sorting through massive amounts of information and condensing it into tidy summaries, which is not surprising seeing as they function by sorting through massive datasets and identifying patterns. Most academics don't read entire articles or books from cover to cover.<sup>134</sup> Sidorkin also acknowledges this, saying "It is important to recognize that often the only individuals who read a scholarly paper from beginning to end are peer reviewers and journal editors."<sup>135</sup> And now, ChatGPT and Gemini can be added to that short list.

I would like to emphasize that while summarizing sources is a great use of AI tools, these summaries should still be verified against the original source material to make sure there's been no *information contamination* or other types of "hallucinations". Just giving them a basic skim works well, and is usually necessary if you want to use quotes or specific ideas to support your argument.

Going forward, would I recommend using AI tools for synthesizing sources to other students? Yeah, I probably would, regardless of the fact that the content produced by AI tools is basic, and the writing they produce can be boring and completely uninspired. The problem is "boring" also applies to the process of writing a literature review or a methodology section. It involves regurgitating information by other people in a way that supports what you want to do, and giving the broad strokes of a very complex methodological framework to justify how you do something. Of course, these are necessary parts of any academic argument, but if we keep expecting these sections to fit into a tidy academic box, then I don't see any reason why an AI can't do it instead.

On the one hand, I think it's possible to leave this structure alone and allow AI to have domain over summarizing and synthesizing sources... and likely no one will actually read them but the AI tools. Or, perhaps it's time to open the tidy box and see what happens if things are allowed to be a bit more creative. From my experience comparing "wraiting" Chapter 2

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<sup>134</sup> A fantastic professor from my bachelor days told me that he would only read the abstract and conclusion of a paper unless he planned to use it as a main source, and even then he would usually just skim through the rest of it.

<sup>135</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 52.

and “writing to it” in Chapter 3, I felt I gained a unique perspective and engaged much more with the methodology sources. You may argue that my methodology section is messy, incomplete, or lacking but I would still argue that *I* gained more from writing (to it) than I did by delegating the task to ChatGPT or Gemini.

### **Simplifying Sources with AI tools**

...the problem is not to direct or methodically apply a thought which pre-exists in principle and in nature, but to bring into being that which does not yet exist (there is no other work, all the rest is arbitrary, mere decoration). To think is to create – there is no other creation – but to create is first of all to engender “thinking” in thought.<sup>136</sup>

You’ve already read this quote from Deleuze in my methodology section, and I’ve referenced it a few times since then. When I first read this passage, I felt like it fit nicely with the approach I was taking in this thesis... at the same time I also wasn’t *completely* sure what it meant. I know this is something you’re not supposed to ever acknowledge in academia, mainly because it puts you at risk of looking stupid (which is of course completely unacceptable). It doesn’t matter how complicated, abstract, or nuanced the text might be, at the end of the day it’s your job to figure it out and never admit to anyone how much effort it took. In general, I’ve never shied away from this aspect of academia, and I’ve been happy to tackle even the most convoluted scholars and philosophers (I’m looking at you Kant). This intellectual challenge is one of the reasons I love academia. It’s why I wasn’t worried when I came into the Screen Cultures program from a very different background than most of the other students, and had some important gaps to fill. I know this may come as a shock to you that I didn’t encounter Kant’s notion of the sublime, McCarthy’s neoliberalism, or Haraway’s posthuman cyborg, in my studies of the Viking Age.

Historically, when I’ve run into academic terminology or concepts that I haven’t understood, I would find articles and books on the topic and read through them until I had a firm grasp of the topic. Well... I would do that if I had the time and it was an important concept that I needed to write about for a paper. If it was something talked about in class in passing, I would usually just google it or read a wikipedia article on the topic. That would often be enough to fill in the necessary gaps, though it might not explain the nuances of a specific quote or concept.

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<sup>136</sup> Deleuze, *Difference and Repetition*, 147.

With the introduction of AI tools, a new option arose... and it's now possible to ask ChatGPT or Gemini to explain a concept, a specific quote or a niche academic term. While reading the sources I collected for my methodology section, I encountered a few different concepts and terms that I asked ChatGPT to explain — including “narrative experiment” and “flattened ontology”. I also did this with the “to think is to create” quote from Deleuze, because I wanted to make sure I understood what it meant in the context of what I was writing about.

Prompt: What does this quote mean? “To think is to create – there is no other creation – but to create is first of all to engender “thinking” in thought.”<sup>1</sup>

ChatGPT-4:

The quote "To think is to create – there is no other creation – but to create is first of all to engender 'thinking' in thought" comes from Gilles Deleuze's philosophical work. This statement encapsulates several key ideas about the nature of thought and creation according to Deleuze's philosophy.

**1 Thinking as Creation:** The idea that "to think is to create" suggests that the act of thinking is itself a form of creation. Deleuze views thought not just as a reflection or a representation of the world but as an active, generative process. Thinking doesn't just passively describe reality; it produces new realities and possibilities. It is a dynamic process that brings something new into existence, whether that be ideas, concepts, or interpretations.

**2 No Other Creation:** The phrase "there is no other creation" emphasizes the primacy of thought in the creative process. This implies that all creation, whether artistic, scientific, or philosophical, fundamentally begins with and is shaped by the process of thinking. Everything that is created is first conceived in the mind, making thought the origin of all creative endeavors.

**3 Engendering Thinking in Thought:** The latter part of the quote, "but to create is first of all to engender 'thinking' in thought," points to a recursive or reflexive aspect of thinking. It means that creative thought itself must produce the conditions and capacities for further thinking. In other words, creative thinking should not only produce ideas but should also enhance, challenge, and expand the capacity to think. This suggests a continuous, self-perpetuating cycle where thinking enhances its own ability to think, leading to richer and more complex forms of creation.

This quote can be seen as a call to recognize and harness the power of thought as a foundational and generative force in all creative endeavors. It challenges us to not only use thinking as a tool but to actively cultivate and expand our thinking to realize its full creative potential. Deleuze's emphasis is on the transformative power of thought, urging us to explore and innovate within the realm of ideas to effect real change in the world.

I found this explanation incredibly useful as it helped me feel confident in my interpretation of the text. I particularly liked how it broke the quote up into its different components and explained each one separately. This way of explaining topics, concepts, and quotes is why AI tools hold incredible value as a teaching tool (something I touch on in the literature review in Chapter 2). Reading the explanation of this quote gave me much clearer framework for what Deleuze considers “creativity” and it became much easier to consider the different ways it can be applied to AI tools. I can argue that the ability to “think” is why AI tools are only capable of *artificial creativity*, and that Runco’s intentionality is an extension of this thinking process. This quote is also a key aspect of my methodology as it also supports Richardson’s “writing as inquiry”, and Gale and Wyatt’s “writing to it” — because writing involves this intentional thinking to create, and at the same time can be a reflexive process of reconsidering initial thoughts and ideas.

So far I’ve said that AI is great at summarizing information, it’s okay at synthesizing information, and I will finish by saying it’s excellent at simplifying information. This may be one of the most exciting uses of tools like ChatGPT or Gemini, because it allows for a true democratization of information. The internet, and specifically Google, started this process by making information accessible in a way that it had never been before. Now, the addition of AI tools means that this information is not just accessible physically, but also intellectually. As I mentioned in the introduction, one of the major criticisms of the academic writing style is that it can be an elitist way of gatekeeping information. We’ve learned that AI tools are great at mimicking that style, but what’s better is that they are just as good at breaking it down.

I would argue that with these AI tools we are seeing the potential to truly democratize information. For example, let’s say the explanation of Deleuze’s quote from earlier was *still* too complicated... I can ask ChatGPT to explain it in a way that’s accessible to a ten year old, or even a toddler. While I thankfully don’t plan on having to explain Deleuze’s theory of creation to a toddler, the point is that with the help of AI tools... I could. You might now be thinking, “I understood Deleuze just fine, and I don’t see why you would need to simplify that quote in the first place.” To which I would say, “Good for you, but can you explain this to me?”

## 2.2 TRAINING FOR IN-CONTEXT LEARNING

We study transformer models directly trained on an ICL objective (Some past work has found that ICL also “emerges” in models trained on general text datasets; Brown et al., 2020). To train a transformer  $T$  with parameters  $\theta$  to perform ICL, we first define a class of functions  $\mathcal{F}$ , a distribution  $p(f)$  supported on  $\mathcal{F}$ , a distribution  $p(x)$  over the domain of functions in  $\mathcal{F}$ , and a loss function  $\mathcal{L}$ . We then choose  $\theta$  to optimize:

$$\arg \min_{\theta} \mathbb{E}_{\substack{\mathbf{x}_1, \dots, \mathbf{x}_n \sim p(x) \\ f \sim p(f)}} \left[ \sum_{i=1}^n \mathcal{L}(f(\mathbf{x}_i), T_{\theta}([\mathbf{x}_1, f(\mathbf{x}_1) \dots, \mathbf{x}_n])) \right] \quad (8)$$

We refer to the resulting  $T_{\theta}$  as an **in-context learner**.

Image 8 (Above): Training for In-Context Learning.<sup>137</sup>

On the off chance you are also an expert in machine learning mathematics, once again “Good for you!” However, for most people (myself included) I would safely say this is a bit beyond their comprehension. This formula was taken from an article titled, *What Learning Algorithm Is In-Context Learning? Investigations with Linear Models*, and is one of the many sources I collected when I first started researching AI tools. Before AI tools I probably wouldn’t have even bothered trying to understand the article, or if I was lucky I might have managed to google my way to a very basic understanding. Even with ChatGPT, the first summary it provided was still very technical and ultimately too complicated for me to grasp (understandably because I don’t have a background in machine learning mathematics). Thankfully, I was able to ask ChatGPT to simplify the summary so that I could grasp the basic concepts of the article. I also uploaded the same image from above into ChatGPT-4 with the very simple prompt: Can you explain this?

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<sup>137</sup> Ekin Akyürek et al., “What Learning Algorithm Is In-Context Learning? Investigations with Linear Models,” in *International Conference on Learning Representations Conference (ICLR 2023)*, Kigali, Rwanda, 2023.

## Overview

The text discusses how transformer models can be directly trained to perform in-context learning. The key idea is to train a transformer model  $T$  with parameters  $\theta$  to minimize a specific loss function defined over a set of functions  $\mathcal{F}$ .

## Definitions

- **Transformer  $T$** : A neural network model with parameters  $\theta$  designed for in-context learning.
- **Parameters  $\theta$** : The weights and biases in the transformer model that are learned during training.
- **Class of Functions  $\mathcal{F}$** : A set of functions that represent different tasks or data distributions.
- **Distribution  $p(f)$** : The probability distribution over the functions  $f$  in  $\mathcal{F}$ .
- **Distribution  $p(x)$** : The probability distribution over the domain of inputs for the functions in  $\mathcal{F}$ .
- **Loss Function  $\mathcal{L}$** : A function that measures the error or cost of the model's predictions.

## Training Objective

The goal is to optimize the parameters  $\theta$  of the transformer  $T$  by minimizing the expected loss over the tasks and data distributions. This is mathematically represented by the equation (8) given in the text:

$$\arg \min_{\theta} \mathbb{E}_{x_1, \dots, x_n \sim p(x), f \sim p(f)} \left[ \sum_{i=1}^n \mathcal{L}(f(x_n), T_{\theta}([x_1, f(x_1), \dots, x_n])) \right]$$

Image 9 (Above): ChatGPT-4 Explanation of Formula in Image 8.

Image 9 is just a small excerpt from a much longer explanation, however, I feel like it still demonstrates the impressive explanatory powers of AI tools. Perhaps after this thesis I'll turn my attention to learning the mathematics behind machine learning, or astrophysics, or any number of topics that were previously inaccessible to me.

I'd like to add an additional note that came after a bit of further reflection on learning using AI tools. As I have shown, they have great potential for making various forms of knowledge more accessible. At the same time, this is also the area with the greater risk for spreading misinformation — simply because you won't be able to determine if what you're learning is correct. The other risk of spreading misinformation comes mostly from a lack of human oversight, for example, if someone doesn't check that the information they received from ChatGPT is correct and publishes it anyway. In this sense, humanity's tendency towards laziness when faced with boring or repetitive tasks could become a real problem. Thankfully

it's also much easier to guard against, as it involves creating guidelines and checkpoints to maintain human oversight. However, when you're learning something for the first time it may not be possible for you to check that the information is correct. For example, if you're using ChatGPT to teach you about complex mathematical equations (like the one above), you probably won't have the knowledge or expertise to even know whether they are wrong or not. This type of ignorance is arguably a bigger threat to the spread of misinformation than laziness, and also much more challenging to prevent.

In summary, through my personal experience of using AI tools to write this thesis I was able to see that they are great at summarizing academic sources, adequate at synthesizing academic sources, and truly excellent at simplifying and explaining academic sources. I know this chapter was quite divergent from the previous chapter, both in style, structure and possibly interest level. I think this is mostly due to the nature of summarizing and synthesizing sources, which requires structure and organization. While I had the general structure of this chapter figured out when I started, I still found that I learned again through the process of writing (to it) — though in this case it was more summarizing my experiences than expressing them. The process was still reflective, and I was able to solidify my stance on the pros and cons of using of AI tools for this part of the thesis process.

## CHAPTER 6: Authorship, Originality, and Editing

When I originally planned the structure of this thesis, this chapter was supposed to be about *writing* the thesis. I assumed that I would be talking a lot in this chapter about the benefits of using AI tools to help “wraite” as Sidorkin calls it. You may have noticed that I haven’t included any more *artificially collaborative* purple text since Chapter 2. Instead, it’s been entirely my writing mixed in with some direct passages from the AI tools. You might be wondering, “So why did you choose to stop using the purple text?” Simply put, I didn’t. As you are well aware of by this point, I haven’t planned this thesis in the traditional way but instead let it unfold before me. This process has been deeply creative and so enjoyable that at no point did I want to give up my voice and replace it with text from ChatGPT or Gemini... so I just *didn’t*.

I imagined this chapter would be where I wrote all about the merits of “wraiting” and how wonderful it is now that AI tools are capable of doing so much of the work. Instead, I’ve been exploring writing in my own voice and not the impersonal “academic” one I’d been developing for over a decade. So I didn’t end up relying on ChatGPT or Gemini to help me write as much as I anticipated, and I therefore don’t have much content to look at (and the stuff I did “wraite” I already talked about in the previous chapter). Rather than sharing my own anecdotes of using AI tools to write this thesis, I want to continue with my “writing (to it) as a method of inquiry” and look at the impact of AI “wraiting” on authorship and originality.

Both of these terms are right up there with “creativity” in their philosophical complexity. The definitions of these concepts are similarly complex and have been the focus of much scholarship.<sup>138</sup> Many of the sources exploring the definitions of these terms come from either a regulatory academic perspective (i.e. how to determine whose name goes on this paper and in what order) or a legal perspective (i.e. copyright laws). Sadly, this also means that these sources are quite boring to read... and even with the assistance of ChatGPT to help me summarize, it was nowhere near as interesting as the scholarship on creativity. I will spare you the (at times pedantic) details and try to give a basic summary of these two concepts.

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<sup>138</sup> Here is just a small sample of some scholarship on the topics of authorship and originality: Amy Brand et al., "Beyond Authorship: Attribution, Contribution, Collaboration, and Credit," *Learned Publishing* 28, no. 2 (2015): 151-155; Gideon Parchomovsky and Alex Stein, "Originality," *University of Pennsylvania Law Review* 95, no. 5 (2009): 1505-1529; Jason W. Osborne and Abigail Holland, "What is Authorship, and What Should it Be? A Survey of Prominent Guidelines for Determining Authorship in Scientific Publications," *Practical Assessment, Research & Evaluation* 14, no. 15 (2009): 1-19; Joshua Guetzkow, Michèle Lamont, and Grégoire Mallard, "What Is Originality in the Humanities and the Social Sciences?" *American Sociological Review* 69, no. 2 (April 2004): 190-212; Russ VerSteeg, "Rethinking Originality," *William & Mary Law Review* 34, no. 3 (1993): 801-882.

## Authorship

Authorship is something I've already touched on in the literature review, and there is a definition on page 33 of this thesis that goes over the basic requirements (at least according to the International Committee of Medical Journal Editors). I'll also give an additional simple definition taken from a summary by ChatGPT-4 of the article, *What is Authorship, and What Should it Be? A Survey of Prominent Guidelines for Determining Authorship in Scientific Publications*, by Osborne and Holland.<sup>139</sup>

Authorship should be limited to individuals who have made substantial contributions to the conception, design, execution, or interpretation of the research.

You might be wondering why I decided to bring in ChatGPT for this summary instead of finding a direct quote or paraphrasing in my own words. The answer is a) the article didn't provide a quotable definition and b) it was quite boring so I was happy to delegate the task to ChatGPT. So based on this definition, you can be considered an author if you've made "substantial contributions" to part of the research process. How they determine what counts as "substantial" enough to be included as a contribution is a matter of debate, one that involves a dedication to the minutiae of academic research that is best left to scholars like Osborne and Holland. For the purpose of this discussion I also asked ChatGPT and Gemini for their definition of authorship.

Prompt: In one paragraph, please give a definition of authorship.

ChatGPT-4:

Authorship refers to the act of creating a work, usually in the realm of literature, art, or academia, that reflects an individual's original ideas, contributions, and intellectual efforts. It denotes the originator of a piece of content, granting them specific rights and responsibilities related to the work's publication and distribution. In academic contexts, authorship implies accountability and endorsement of the content, often following criteria that might include significant contributions to the conception, design, execution, or interpretation of the reported study. In literary and artistic fields, authorship not only attributes creation and ownership but also shapes the interpretation and reception of the work. The concept is also central to discussions in copyright law, where determining authorship can affect the rights to use, modify, or reproduce a work.

Gemini Advanced:

Authorship refers to the state or fact of being the creator of a work, typically a written or artistic one. It encompasses not only the act of creating but also the rights and

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<sup>139</sup> Summarized by ChatGPT-4 from Osborne, Jason W., and Abigail Holland. 2009. "What is Authorship, and What Should it Be? A Survey of Prominent Guidelines for Determining Authorship in Scientific Publications." *Practical Assessment, Research & Evaluation* 14 (15).

responsibilities associated with being the originator. These rights include claiming ownership of the work, controlling its distribution and reproduction, and receiving credit and compensation for its use. In some contexts, authorship can also extend to the idea or concept behind a work, even if the specific form is created by someone else.

So based on these definitions, authorship involves being the “originator” of a piece of work (artistic or academic), which comes with a degree of ownership and accountability. One of the main discussions surrounding authorship and AI tools focuses on whether these tools can be considered an “author”. As I touched on earlier in the literature review, some scholars have gone so far as to call ChatGPT a “co-author”. I’ve also already shared my stance on that — I disagree with the attribution of “author” to AI tools because they can not be held *accountable* for the content they produce. I find it interesting that the ChatGPT-4 answer had a more academic focus on authorship, and explicitly stated “authorship implies accountability and endorsement of the content”, which further supports my argument for why these tools can *not* be considered authors.

So if AI tools can’t be considered authors, what else is there to discuss? When I first started writing this thesis I read the newly published, *Embracing Chatbots in Higher Education: The Use of Artificial Intelligence in Teaching, Administration, and Scholarship*, by Alexander Sidorkin. He made some interesting points about how AI tools challenge our traditional understanding and definitions of authorship, and I wanted to discuss how my thoughts on those points have changed throughout the process of writing this thesis.

### **Some Thoughts on Sidorkin’s “Wraiting”**

In the introduction of his book, Sidorkin acknowledges how these tools challenge our traditional understandings of authorship:

Once upon a time, writing was a solitary endeavor. But with AI’s involvement, it has transformed into a creative partnership, where you are not the only participant.<sup>140</sup>

He further outlines this collapse of the “solitary writer” by saying:

“Wraiting” requires one to set aside any anxieties about the content generated. One needs to overcome the traditional demarcation between “mine” and “not mine.” When text is crafted from your AI-guided prompts, even if it does not mirror your usual style or voice, it is vital to perceive it as yours. Or, rather, what is important and original there is yours, and whatever is not yours is common knowledge.<sup>141</sup>

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<sup>140</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 16.

<sup>141</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 17.

Based on this process, which I have described as an *artificial collaboration* (in Chapter 4), I think it's possible to still argue that writing is a solitary endeavour, and that this collaboration process instead turns you from a writer into an editor. When I am writing now (and as I have throughout this thesis in *Times New Roman* text), it is just me and the blank page. For better or worse, every word I've typed in this font has come uninterrupted from my brain to the page. In the context of authorship, I am the solitary author and this *original* text is mine in all senses (including legally). However, when I have included content from this process of *artificial collaboration* (in purple), the majority of the text was written by AI and those sections were then edited by me (in the process outlined by Sidorkin above).

So I might propose a challenge to Sidorkin's terminology, and say that when we *artificially collaborate* with AI tools we are "edaiting" not "wraiting". Regardless of what we call it — I agree with Sidorkin that what you produce is yours. Specifically, I agree that *you* alone are the author and can be held fully accountable (for better or worse) for what you produce with the assistance of AI tools. In this thesis, I also go one step further than him with my support of the transparent use of these tools, which I do by acknowledging both *how* and *where* they are used.

Before I move on to ideas of *originality*, I do want to put forth an alternative theory for why I didn't incorporate more "edaiting" into this thesis. I have been arguing that the process of "edaiting" did not produce very good quality content, was time consuming, and ultimately fell short of my expectations. I have been considering this the case because "edaiting" relies mostly on one's critical thinking skills and does not involve *much* creativity (like solving a puzzle rather than painting a picture). It also tends to produce content in the traditional academic style, which further reinforces a formal rigidity and lack of personality in the text. However, in order to be truly critical of my approach, it is also entirely possible that I am just not very good at "edaiting".

### **An Afterthought on Sidorkin's Wraiting**

I wrote the previous paragraphs yesterday feeling very certain that "edaiting" was a critical thinking process, and not necessarily a creative one. I slept on it and woke up today feeling not so sure. Many authors argue that our critical thinking skills are enmeshed with our

creativity, and they are often discussed together.<sup>142</sup> So I don't think I can say "edaiting" is *not* a creative process, but I do think it asks more of our critical thinking skills than our creativity.

Though then again... when I think about traditional editing, the analogy that comes to mind is a sculptor shaping a lump of clay into a new form. Sculpting is in many ways more similar to "edaiting" than the traditional form of editing, which involves working with content that has already been created (either by yourself or someone else). The sculptor doesn't create the clay but sources it, and can add certain qualities to make it more pliable to work with. In the same way, this process of "edaiting" also starts with existing content, that can be made more pliable through the right prompts. Right now is an exciting time to be a "sculptor" in the world of AI, because the process of how to sculpt — which I'm currently calling "edaiting" — is still being discovered.

So perhaps I'm not great at the process of "edaiting" and that with time, I will be able to master the skill. Sidorkin does explicitly call his concept of "wraiting" an advanced skill:

Now, you might be thinking: why is something meant to *simplify* writing being presented as a complex skill? Well, *all* tools designed to make our lives easier require understanding and skills to use effectively.<sup>143</sup>

He goes on to state:

As I have discussed at length in this book, the quality of the text often hinges on the difference between a poorly thought-out prompt and a carefully crafted one. The distinction between a dull, AI-generated text and a more insightful, AI-assisted text lies not in the chatbot itself but in how it is utilized.<sup>144</sup>

So is an expert at prompt engineering a modern day sculptor, who works in information instead of clay? While I can certainly see the creative potential, my prediction is that this will be seen as a "critical thinking skill" not a creative one. Even the current term "prompt engineer" emphasizes this connection to more "scientific" endeavours. Though maybe it's possible to suggest a new term for this as well — an AI sculptor, a sculptor of prompts, or a prompt designer?

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<sup>142</sup> Bengi Birgili, "Creative and Critical Thinking Skills in Problem-Based Learning Environments," *Journal of Gifted Education and Creativity* 2, no. 2 (2015): 71-80; Phil Clegg, "Creativity and Critical Thinking in the Globalised University," *Innovations in Education and Teaching International* 45, no. 3 (2008): 219-226; Joe YF Lau, *An Introduction to Critical Thinking and Creativity: Think More, Think Better* (Hoboken, NJ: John Wiley & Sons, 2011); Steve Padget, ed., *Creativity and Critical Thinking* (Abingdon: Routledge, 2013); Solange Muglia Wechsler et al., "Creative and Critical Thinking: Independent or Overlapping Components?" *Thinking Skills and Creativity* 27 (2018): 114-122.

<sup>143</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 1-2.

<sup>144</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 96.

It's truly hard to predict what the future holds when it comes to AI tools, mainly because of how fast they are evolving. In some ways it makes me think back to the early days of Google and the introduction of the "google search". Did that feel like a similar type of disruption?<sup>145</sup> I can imagine that being able to search the internet to find new information felt like discovering a new frontier. Especially when compared to the "old" process, which involved physically going to the library and reading through countless books to find what you needed. Google has completely changed the way we access information, and has become an integrated part of academia (think of Google Scholar). I would go so far as to say that much of modern research would be impossible without the accessibility it provides. However, this change didn't happen overnight. It took *years* for Google to become the predominant search engine, and for its abilities to evolve.<sup>146</sup>

Now, developments with AI tools are happening within the span of months, and even weeks... something I have personally experienced over the course of writing this thesis. This speed of evolution makes it incredibly hard to predict the future of using AI tools, especially when that future is weeks or months away, and not years. Will the role of "AI sculptor" continue to develop into a valuable skill, or will prompting become as common place as a google search?<sup>147</sup> As with many things in life, only time will tell how this unfolds, though it's certainly an interesting perspective to keep in mind while it does.

## **Originality**

So now that we've looked at the concept of authorship, you might be wondering how I reconcile ideas of "originality" with content produced by AI tools. As I previously mentioned, the majority of academic sources I found giving definitions of "originality" were from a legal perspective. I will include one such definition from an article titled, *Originality*, by Gideon Parchomovsky and Alex Stein:

To prove originality, an author needs to show that the expression for which protection is sought originated with her and was not copied from someone else. Once this showing is made, an author only needs to demonstrate that her expression contains a

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<sup>145</sup> You may remember that transition very well... or (if a future student stumbles upon this thesis in the archives) you may not have been born yet. As a millennial, I do remember the world before google (barely), but by the time I started my higher education, it had become full integrated in our daily lives.

<sup>146</sup> Elizabeth Van Couvering, "The History of the Internet Search Engine: Navigational Media and the Traffic Commodity," in *Web Search: Multidisciplinary Perspectives* (Berlin, Heidelberg: Springer Berlin Heidelberg, 2008), 177-206.

<sup>147</sup> Of course I'm not saying there is no skill involved in using search engines. It's taken me many years to learn how to effectively use the internet for researching in academia... but I also wouldn't put down "Expert Google Searcher" on my resume.

modicum of creativity and that it was fixed in a tangible medium of expression in order to enjoy the full panoply of exclusive rights and benefits under copyright law.<sup>148</sup>

As you may have already guessed, this article gives a definition of originality in the context of copyright law. So basically for something to be *original* it can't have been copied from someone else, it needs to involve a "modicum of creativity", and it has to be tangible in some way. How they differentiate between a "modicum" and a say "speck" or a "pinch" of creativity is not clear. To answer this question, you would have to ask a philosopher or a lawyer... and I'm sure you'd end up with an exceedingly abstract or incessantly pedantic reply. Based on everything I've learned from my creativity research, I think it might be better to avoid asking that particular question altogether. Instead, I will give a similar prompt to ChatGPT and Gemini and ask their definitions of originality.

Prompt: In one paragraph, please give a definition of originality.

ChatGPT-4:

Originality refers to the quality of being novel and not derived from something else. It is characterized by unique thoughts, expressions, or creations that stand apart from previous works or ideas. In the arts, literature, science, and other fields, originality is a valued attribute because it contributes new perspectives, innovations, or methods that can enhance understanding, aesthetic appreciation, or practical applications. This concept is fundamental to intellectual property laws that protect creative works, underscoring the societal and cultural importance of fresh and original contributions. Originality is often what distinguishes merely repetitive or derivative endeavors from those that are groundbreaking and transformative.

Gemini Advanced:

Originality is the quality of being new, innovative, and not derived from existing sources. It refers to the ability to think independently and creatively, producing ideas, works, or solutions that are unique and haven't been seen before. Originality is often associated with inventiveness, imagination, and the courage to break away from established norms or conventions. It can be applied to various fields, including art, literature, music, science, and technology, and is valued for its contribution to progress and the advancement of knowledge.

Based on these definitions, it's easy to see why originality (also called "novelty") is an important aspect of creativity. In many ways, these answers are similar to the ChatGPT and Gemini responses to "What is creativity?" in Chapter 4. Originality and creativity are closely tied, however the concept of originality takes on an important extra *legal* dimension, as it's used to protect creative and intellectual works from being stolen or plagiarized.

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<sup>148</sup> Parchomovsky and Stein, "Originality," 1505-1506.

This ability to create “novel” works is also one of the reasons AI tools are causing big waves in both academic and legal contexts. As I’ve already mentioned (in Chapter 4), one of the reasons it’s arguably necessary to expand the current standard definition of creativity is because AI tools like ChatGPT and Gemini are technically able to create original content. Of course it’s possible to argue these tools are incapable of that necessary “modicum” of creativity (from Stein’s definition). However, it quickly becomes a bit of a circular argument if to try to prove that point by referring back to the “standard definition” of creativity. In the case of copyright law, I am not a lawyer and don’t feel able to weigh in on the complexities of this issue. Instead I will quote Sidorkin who also sidestepped this discussion, saying simply “...we are at a point where we may have to think about how copyright laws might need to change because of AI and writing.”<sup>149</sup> I agree, that yes, more discussion on the topic is needed and (at least at this point in time) I will happily leave it to the lawyers.

The other issue with AI tools is that they can produce content without providing the necessary sources, where they basically engage in a form of plagiarism. As I’ve already mentioned in Chapter 2, plagiarism is one of the major concerns in much of the scholarship on the use AI tools in academia. Tang et al. summarize these concerns in their article, *The Importance of Transparency: Declaring the Use of Generative Artificial Intelligence (AI) in Academic Writing*, where they state:

Additional ethical concerns beyond authorship issues include copyright implications arising from the use of third-party content, conflict of interest, and the broader concept of plagiarism, which encompasses not only verbatim text copying but also the replication of ideas, methods, graphics, and other forms of intellectual output originating from others.<sup>150</sup>

Sidorkin navigates this ethical conundrum by taking the stance that anything the AI tools produce can be considered “common knowledge” and does not require any references. At the same time, he also acknowledges the dangers of AI being able to produce plagiarized content. About the plagiarism problem he says:

AI can make plagiarism easier to carry out and harder to detect. For instance, these tools can take key ideas from someone’s text and rewrite them in a way that would not be flagged by plagiarism software. Although the words are different, the ideas are essentially stolen.<sup>151</sup>

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<sup>149</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 97.

<sup>150</sup> Tang et al., “The Importance of Transparency,” 315.

<sup>151</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 97.

However, he then goes on to challenge the definition of “originality”, saying:

Traditional writing, with its physicality and tactile engagement, can lend an illusion of unique originality. Each text appears as a statue chiseled out from a block of marble by the author’s hand, an original creation borne from the raw material of thought.

However, this perceived originality is a siren song, a deceptive tune that veils the rarity of truly novel ideas in a sea of repetitive and borrowed thoughts.

“Wraiting,” on the other hand, exposes the illusion and reveals the underlying reality of text production. It forces us to confront the fact that our work often stands not just on the shoulders of individual intellectual giants, but also on the collective effort of countless unnamed others, whose ideas form the vast corpus from which we borrow. It makes us aware that authorship is less about a claim of individual originality and more about a thoughtful curation and interpretation of our shared intellectual heritage. Through this lens, “wraiting” might indeed be a profound expansion of the author’s role, a recognition of our intertwined discursive existence.<sup>152</sup>

This is quite an unusual stance for a scholar to make, especially in a book that is “© Alexandar Sidorkin 2024”. I’m also not entirely sure how I feel about it either. I first read this passage before I started writing the thesis, and as I mentioned at the beginning of this chapter, I had very different expectations for how this thesis would turn out. I didn’t necessarily agree with this quote back then either, but I found it quite thought provoking. It connected to my anthropologist background, where I learned that much of human knowledge comes from a shared place and that similar, or even the same ideas, can be produced independently.<sup>153</sup> This quote also connected to my historical background, as I have also studied the evolution of writing, including the invention of the modern day printing press. This is was a turning point for our notions of authorship (and ownership), as before our way of telling stories was through the more communal format of oral history.<sup>154</sup>

So theoretically, I agree with the premise that the entirety of human knowledge is not able to be attributed to individuals, and that even when an original idea is produced, it’s also possible for another person to come up with that same (or similar) idea. It should therefore be an easy next step to support the communal format of accessing knowledge through AI tools like ChatGPT and Gemini. It’s not an easy step though. This explanation doesn’t sit well even

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<sup>152</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 97.

<sup>153</sup> For example, the development of agriculture (a.k.a. farming) happened independently in different areas of the world at different times. Mithen, *Creativity in Human Evolution and Prehistory*, 149.

<sup>154</sup> If you want to argue that we also had manuscripts before the invention of the printing press, yes I know. However, the majority of manuscripts were religious texts copied by monks (often multiple monks working on one text over many years). There are also a few examples of secular books with an attributed author, one of the more famous examples is *The Canterbury Tales* by Geoffrey Chaucer, but it was not until the printing press that secular books became accessible and the occupation of “writer” became possible.

if I can appreciate the reasoning behind it. Of course, it could be the voice of academia in my head that's been threatening me with the dangers of plagiarism, its resulting shame, and the finality of academic expulsion for over a decade. Or it could be the fact that our main currency in academia, and arguably the wider world, revolves around ownership. The ownership of ideas is what careers are built on (both in and outside of academia) and giving that up seems dangerous in ways that go beyond the violation of academic integrity. Bishop addresses this point specifically when talking about her concerns around AI tools:

Ideas come from people, and people like to get credit for their work. Researchers *need* to get credit for the ideas they generate. This is how they keep their jobs and get promoted. Invoking other people's ideas without giving them credit is plagiarism... even if you put it into your own words.<sup>155</sup>

Sadly, I don't think the threat of relinquishing ownership of our ideas seems like a big step, especially considering we've already been forced to give up ownership of our data (and the privacy and security that goes along with that). Big Tech<sup>156</sup> has already been found guilty of monetizing our data and selling it to the highest bidders,<sup>157</sup> and now we have AI tools that seem to flaunt that stolen data in our faces. Of course you could also argue that we all tick the "agree" button at the end of the Terms of Use for each iPhone or Android update we get, and that makes us complicit in this data theft — a form of ritual sacrifice to placate our Big Tech gods. However, I would argue that feels like shifting the blame to the people trapped in a complex system not of their own making and who, as individuals, have no power to enact change within the system.<sup>158</sup> No one knew what they were signing on for when they got their first smartphone, and looking back, I wonder how many people would still have chosen one if they were give a realistic Terms of Use.

Just as with the introduction of the smartphone, we have no way of knowing what our future holds with these AI tools. Of course it's possible to *try* to make predictions, however, the more I've learned about these tools over the course of this thesis, the less confident I am to

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<sup>155</sup> Bishop, "A Computer Wrote this Paper," 8.

<sup>156</sup> The term "Big Tech" is usually considered a reference to Apple, Amazon, Microsoft, Google/Alphabet, and Facebook/Meta. Kean Birch and Kelly Bronson, "Big Tech," *Science as Culture* 31, no. 1 (2022): 1-14.

<sup>157</sup> Cecilia Kang and David McCabe, "U.S. Antitrust Case Against Google Is Just the Start," *The New York Times*, May 3, 2024, <https://www.nytimes.com/2024/05/03/technology/google-apple-amazon-meta-antitrust.html>; Rosalie Chan, "The Cambridge Analytica Whistleblower Christopher Wylie Discusses Facebook Data Scandal," *Business Insider*, October 5, 2019, <https://www.businessinsider.com/cambridge-analytica-whistleblower-christopher-wylie-facebook-data-2019-10>.

<sup>158</sup> It's the same deflection of blame we see when the oil companies tell the public that it's our job to fix climate change... that if we just recycled a bit more things would get better. Jokes on us, because we now recycling doesn't actually work and it was invented by oil companies as a way to distract the public from the damage they were doing. NPR, "How Big Oil Misled the Public Into Believing Plastic Would Be Recycled," September 11, 2020, <https://www.npr.org/2020/09/11/897692090/how-big-oil-misled-the-public-into-believing-plastic-would-be-recycled>.

make predictions. As I've said, this is because of the rapid rate of evolution these tools have... at the time of writing this sentence it's been exactly one week since ChatGPT-4o (the "o" stands for omni) was released on May 13th, 2024. Among the many new features, this update includes the ability to have conversations with an AI voice that sounds eerily similar to the one from the movie *Her*.<sup>159</sup> So this lack of predictability is certainly concerning, and it's definitely a further reason to be critical.

When I say to be critical, I don't just mean of the content produced by these AI tools (and the potential plagiarism and copyright infringements), but also of the greater picture — meaning the policies being implemented and the discourse being shaped by the companies controlling these AI tools. I know this sounds dramatic and almost dystopian, but it's depressingly easy to see the ways Big Tech can manipulate us into giving up ownership of our ideas, as they've already set a precedence with the ways they control our data.

So, this section got a bit darker than I anticipated. As I'm continuing to learn with writing (to it) as a method of inquiry, I can anticipate where I *think* a chapter is going and end up in a completely different place with very different observations than I assumed I would make. I also realized as I was writing this chapter that the structure of the thesis writing process that I outlined in the introduction was missing something. A quick refresher — I divided the three main stages of writing a master's thesis into: 1. Brainstorming and Concept Creation 2. Summarizing, Synthesizing, and Simplifying Sources of Information and 3. Writing the Thesis. I've realized now I'm missing the last step — the *editing* of the final draft.

## **Editing**

This has always been a real issue for me, as I find the process of editing (checking spelling, grammar, formatting, citations etc.) incredibly boring. I'm happy to reflect on the content of my work and rearrange sections to find the best flow, but I find it painful to go through every word I just wrote to make sure I didn't forget a comma... or used too many to create a run-on sentence. My original thought was to add a section here where I used ChatGPT and Gemini to edit the draft of this thesis up to this point (Chapter 1-6) and describe the pros and cons of this process (similar to what I did in Chapter 5). However, I quickly realized that this has the

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<sup>159</sup> Alex Mitchell, "New ChatGPT Voice Sounds Like Scarlett Johansson in 'Her,' Gobsmacked Users Claim — and It May Be on Purpose," *New York Post*, May 14, 2024, <https://nypost.com/2024/05/14/tech/new-chatgpt-voice-sounds-like-scarlett-johansson-in-her-users-claim-and-it-may-be-on-purpose/>.

potential to be quite problematic if I want to protect myself against the dangers of plagiarism from using these tools.

As I've already talked about, any content that AI tools produce is based on a vast amount of data that has been collected (in arguably questionable ways) and used to train these tools. There is another side to this equation, which is not about the content produced by these tools but what happens to the content we put *into* them. Simply put — what happens to the information I copy-paste or upload into ChatGPT/Gemini? Trying to find a clear answer to this question is not simple, and I can't say I'm surprised. One of the easiest ways for Big Tech companies to use our data is to simply do it without expressly stating that they will, and get our "consent" by hiding it in the fine print of the Terms of Use (sometimes also called Terms of Service). I did a little digging into OpenAI and Google's websites to see if I could find any answers, and I'll start with Open AI's policy.

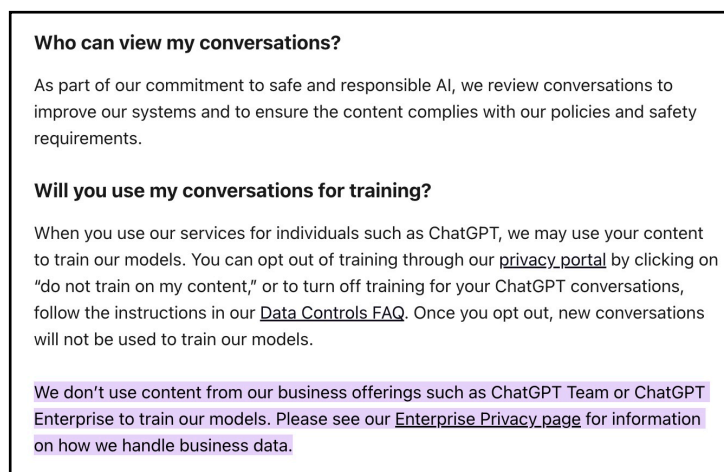


Image 10 (Above): From OpenAI's website, under the heading "What is ChatGPT?"<sup>160</sup>

Here you can see that unless you choose to "opt out", OpenAI will use your content to train ChatGPT. Based on this premise it would seem that you are able to choose whether or not your content is used, and they say if you turn this option off (assuming you know it exists) "your conversations will not be used to train our models" (see Image 10 above). However, this still leaves a lot of grey area for what they *will* still be able to do with your content. Maybe they don't include it in training sets, but does that mean it stays your intellectual property under current copyright laws? I also find it interesting that OpenAI has highlighted a section

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<sup>160</sup> OpenAI, "What is ChatGPT?" *OpenAI Help Center*, accessed May 20, 2024, <https://help.openai.com/en/articles/6783457-what-is-chatgpt>.

on their website (see Image 10) where they explicitly state that they don't use any content from their "business" versions of ChatGPT (Team and Enterprise). I assume this is to help reassure businesses who want to use their services. However, if I'm reading between the lines, it could also be interpreted, "As a business, we value your intellectual property more than our non-business users (who we can more easily steal from without them realizing or trying to sue us for copyright infringement)."

Let's move on to Google now...

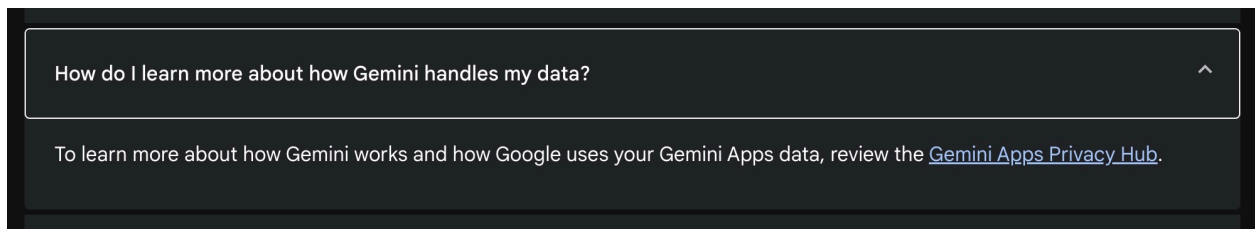


Image 11 (Above): From Google's website, under the heading "FAQ"<sup>161</sup>

I found it quite interesting (though again not surprising) that the first website that addresses how Gemini uses data doesn't actually *say* anything (see Image 11). Instead, it provides a link so that *you* can take the time to go "review the Gemini Apps Privacy Hub". The link leads to a plain looking web page that consists of a very long Terms of Service for using Gemini, you can see a small screenshot of the much longer webpage above (see Image 12).

I would encourage you to go check it out... even if it's just to see how one of the biggest tech companies (who pioneered the modern internet) used all that experience to make a visually bland and incredibly vague webpage. It's hard to imagine this is a simple lack of oversight, and instead looks much more like a deliberate choice.

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<sup>161</sup> Google, "FAQ," *Gemini by Google*, accessed May 20, 2024, <https://gemini.google.com/faq>.

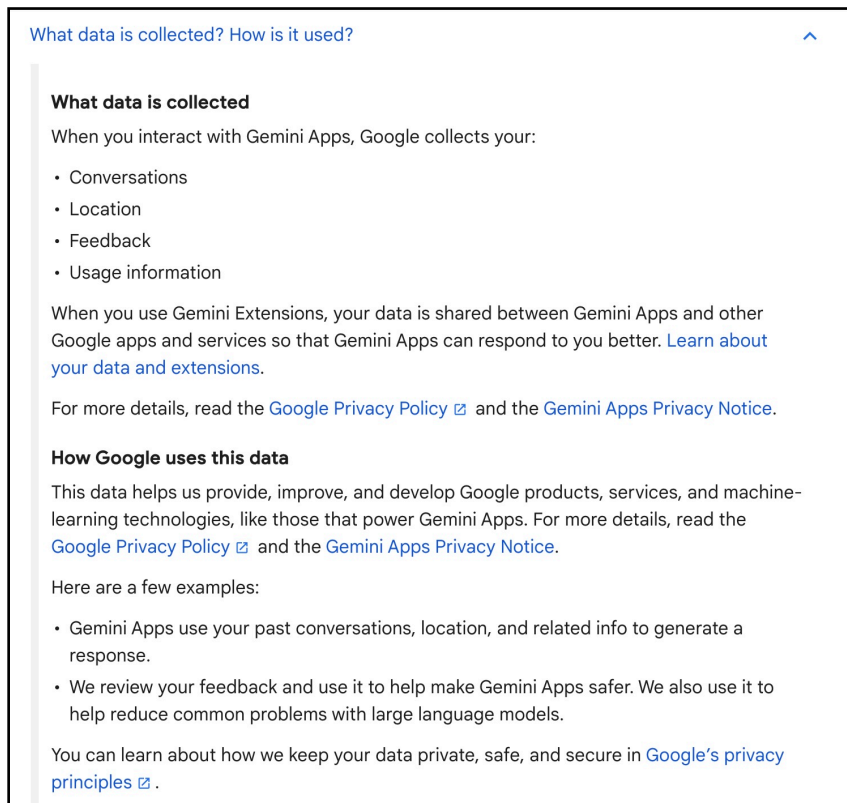


Image 12 (Above): From Google’s website, titled, “What Data is Collected? How is It Used”<sup>162</sup>

As someone with some basic understanding of website UX (user experience), it’s basic practice to keep things as simple as possible.<sup>163</sup> Through studying how users interact with webpages, we have learned that the more steps you add to a process (i.e. links to follow) the more likely people are to give up and leave the webpage.<sup>164</sup> It seems almost too obvious that Google has chosen to add additional steps as a barrier to tracking down the question “What is happening to my data?” Once you actually get to the right webpage the answers they give are very vague. For example it says, “We review your feedback and use it to help make Gemini Apps safer.” *How* do they make it safer? What do they mean by *safer*? What does the “review” process look like? I would imagine that Google’s review process is a bit more involved than the “review” process they suggest the public do with the information provided at the Gemini Apps Privacy Hub (see Image 11). They also say that they collect your

<sup>162</sup> Google, "What Data is Collected & How is It Used," *Google Support*, accessed May 20, 2024, <https://support.google.com/gemini/answer/13594961?hl=en>.

<sup>163</sup> Deniz Canca and Ziya Nazım Perdahçı, "User Experience Analysis of an Original Website Designed with Simplicity from the Perspective of Technology Acceptance Model," *Acta Infologica* 7, no. 1 (2024): 95-106.

<sup>164</sup> For example, when it comes to online shopping they make the process as simple as possible, because they know that every click of a button or link to a new page is a barrier to the final checkout.

conversations, location, feedback, and usage information — but they don't explain what each of those categories consists of *or* what they do after this information has been collected.

It would seem that hiding information in the fine print of the Terms of Service is no longer enough for Google, they have now made it hard to even *find* the fine print. Even if you do manage to find the fine print, I wish you luck interpreting what they are actually doing with your data. I assume the use of these vague terms is meant to feel reassuring and accessible (because it's not filled with legal jargon). It also seems to imply that the public shouldn't read too much into things and simply trust that Google or OpenAI has our best interests at heart. And maybe they do... but I suspect they might have *their* best interests (and profits) at heart.

So just to clearly state this — I will not be asking ChatGPT or Gemini to edit this thesis for spelling and grammar mistakes because I don't think it's worth (potentially) losing ownership of my ideas. The only text from this thesis I would be happy to use for the purpose of testing the editing skills of AI tools is the literature review from Chapter 2. However, seeing as that text was mostly written by the tools themselves I don't see much point. So instead, I will resort to my usual approach to editing... and ask my friends and family to read it over (and of course, thank them in the acknowledgements). Though the more I think about it, because I've taken a more creative approach to writing this thesis, I might actually *want* to read it again.

## CHAPTER 7: Discussion

I'd just like to take a moment to say congratulations (to both of us) on making it this far! This chapter is the "discussion" section, and in a traditional thesis this is where I interpret the results from my research and contextualize it within the scope of the "Thesis Question". It's also supposed to contextualize what I've learned within the existing scholarship on the topic, usually in a way that's either complimentary, contradictory, or sometimes a bit of both. It's also a place to talk about any unexpected results I encountered, and address any limitations of the thesis. It should finish off with suggestions for future research based on my findings. However, as I've already spent many pages establishing, this is not a traditional thesis and this will not be a traditional discussion either.

When I first sat down to write this chapter I struggled to figure out how to make everything I'd done fit into this "discussion" format. It felt awkward and it quickly turned into a summary of the findings from the "main" chapters (Chapter 4-6). I couldn't figure out if this was because of my unorthodox approach to "writing (to it) as a method of inquiry" or because it was structured as a "meta-thesis". At first I thought if I organized my findings that would help, which ended up with me creating a table where I chronologically mapped all my findings based on each chapter. However, when I went to start writing and I once again ran into the same summarizing problem. I felt like I was re-writing my thesis, and then I realized that's exactly what I was doing and why it wasn't working.

So the answer to why this section has been so challenging to write is because this is a meta-thesis. Basically, in many ways this entire thesis is a super long "discussion" chapter, and trying to discuss my findings from each chapter in *another* chapter would be an exercise in redundancy. But don't worry, there is still quite a bit to discuss... starting with my findings from this *entire* meta-thesis writing process. In keeping with my unusual methodological approach, I will begin with a story.

### **Broader Findings and Some Unexpected Answers**

When I first decided I would try to submit this thesis by June 2024, I was still recovering from my year-long sick leave. I made the decision over the Christmas holidays and it took a few months after that before I was even able to start. This put a rather intense time pressure on me, and as I've previously said, it felt like an impossible task to finish in the time I had (roughly three months). I had not figured out my thesis question yet, but at that point my only goal was

to submit something in hopes of passing and completing my degree. This led me to have a very realistic talk with my supervisor Steffen, explaining to him that based on my still recovering health and academic exhaustion, I planned to be done in June — with or without my degree.

It was not a conversation I assume most supervisors ever want to have. A master's student is meant to be “bright-eyed and bushy-tailed” — filled with ambition and eagerness to tackle the rigours of academia. Yet here I was, an exhausted husk of the student I had once been. I am extremely grateful to Steffen for his compassion and understanding during that tough conversation. I imagine many professors would have either encouraged me to take an extra semester or give up completely. Instead, he understood my limitations and tried to help me work with them.

During this conversation, I debated with him on the value of a master's thesis. I said that this format for testing students was probably going to die out now that an AI tool could write it for them instead. I was very passionate about how academia needed to figure out other ways to evaluate a student's knowledge (I think I pointed out the merits of the oral exam?). I felt like academic writing would no longer hold the value it used to, and like I said in my introduction, that this skill I spent over a decade developing was now obsolete. Steffen argued my points, saying there was still value to be had in the process of writing. That writing a thesis (or paper or book) was valuable because of the time that goes into contemplating the ideas, testing them out, and organizing all that time and effort into a coherent text. I think my rebuttal was something along the lines of “Yes it's valuable to be able to think, study, research and otherwise reflect on topics... but I could just as easily tell you about it rather than write about it.”

I still think that there are many different ways to evaluate someone's knowledge on a topic, and that there are many people who do not feel comfortable or confident expressing themselves through writing. There are a variety of reasons for this (ranging from learning disabilities to neurodivergence to different styles of learning), but I will simply say “People's brains work in different ways.” Something that should *not* come as a shock in this day and age. I pictured the potential of AI tools to challenge the chokehold that writing has on academia, and that it would be a huge step towards accessibility in education. The closest I got to exploring this point was when I briefly mentioned the potential of generative AI as

teaching tools in my literature review (in Chapter 2), and later sharing my own experiences using these tools to simplify concepts that would be otherwise inaccessible to me (Chapter 5). I would also like to clearly highlight this as an exciting area for future scholarship.

The confidence with which I argued for the end of academic writing with Steffen has been profoundly shaken up by this thesis. I still believe that the “traditional academic writing” I critiqued in the introduction is still in danger, simply because AI tools do an excellent (or at least adequate) job of mimicking this style. It’s not surprising that a machine can pass so easily as an impersonal, objective, third-person when they have no “self” (voice, personality or thoughts) to filter out. I identified this as a problem in my introduction, and decided to break with all protocol and tradition by using one word — “I”.

For the first time in my academic career I gave myself a voice. Previously, I have enjoyed the challenges of academic writing and exercising my critical thinking skills. I was often able to manifest a steady stream of creativity by choosing the *right* words... ones that showed I was clever, concise, and occasionally even witty. Now this style felt empty, and I worried about encountering the question, “Did she write this or an AI?” So, I took it as a challenge and I set out to write a thesis that an AI *couldn't* write, and in that (and perhaps only that) I have succeeded.

Using “I” was the beginning, and it turned the “steady stream” of creativity into a full blown tsunami. I had so much fun writing this thesis because it became an exploration of what academic research could look like if there was space for creativity and self-reflection. All of a sudden my voice, thoughts, and opinions had inherent value... and not only if I contextualized each of my ideas by drowning them in a sea of other scholars previous works. Of course, I’ve still brought in many scholars throughout this thesis, but I held my ideas up against theirs as opposed to *under* them.

I was fortunate to stumble upon the scholars I included in my tea party (Chapter 3) to help shape my approach (and hopefully legitimize it in the critical gaze of academia). The process of writing (to it) as a method of inquiry has generated many new perspectives and ideas on the uses of AI tools in academia, and specifically for the task of writing a master’s thesis. Many of the preconceived notions I had going into this process were challenged, and the biggest one was what I was capable of doing in the limited time I had. This thesis has reinvigorated my passion for learning and simultaneously challenged my ideas of efficiency.

For example, I wrote Chapter 5 in an afternoon *without* AI tools (which may or may not surprise you, depending on your opinion of that chapter). Regardless, this freedom to explore has shown me new ways of looking at myself and the world, and at the same time given me valuable perspectives on a rapidly evolving and incredibly disruptive technology. So even if this thesis doesn't "do well" (meaning I fail or get a bad grade), by my estimation it will still be a complete success.

You might be saying, "Good for you, but you haven't actually answered your thesis question." Or you might be saying, "Wait, what even was your thesis question?" Both are good points. As I already mentioned at the start of this chapter, the thesis question was not so much a clear question as a general exploration (and yes I know that's not the "proper" way to do it). If when I started this journey you had demanded I chose a thesis question, I probably would have said — "How does using AI tools impact the thesis writing process?" After going on a journey of discovery, I can now say the answer to this is much more complex than I imagined! If I had to give an answer now it would be — "Quite a lot! Or maybe not at all? It depends on your approach."

The problem is that if I answered *just* this question, I would be ignoring a big part of what I discovered in this thesis. I told you about the conversation I had with Steffen, because it helped shaped my approach to this thesis. When I started writing I wasn't aware that I was also trying to answer the question — "Will AI tools replace the need for academic writing?" As I mentioned, I was quite confident that academic writing was no longer going to be a valid way to evaluate students. However, I think a better version of this question might be — "How will AI tools impact the *value* of academic writing?" This question is what shaped my approach to writing this thesis (even if I didn't know it at the time), and I've come to the conclusion that AI tools are certainly a threat to *some* forms of academic writing.

The "traditional" style is certainly easily replicable by AI tools, and I will speculate that AI tools could bring about a change in how we value text produced in this style. Meaning, if it becomes easier or a completely automated process of "edaiting" academic content (e.g. books, articles, student essays or theses), it may lead to informational saturation. The academic "market" (to follow the saturation analogy) could become flooded with content written and edited by AI. This content (as you've experienced in my literature review) is quite bland, uninspiring and soulless, which may lead to no one bothering to read it. Instead, AI tools will

also be used to summarize, synthesize and/or simplify the AI produced content. Eventually this process could lead to a closed *AI loop*, with increasingly stale ideas (due to that missing creative spark), and dubious claims to authorship or originality. Of course, I would call this the worst case scenario, but I am certainly not the only person who has glimpsed that possibility. As I explore in Chapter 2, many scholars are raising concerns around plagiarism, authorship, the spread of misinformation, copyright, and diminishing creativity and critical thinking skills (the genetic drift example).

So how to avoid this depressing possibility? I think that's a question on many scholars minds, and like many things in life... I don't think there's just one answer. It's more likely a variety of approaches that the academic community can incorporate to steer away from the dismal eventuality of the *AI loop*. In writing this thesis, I believe I have identified at least one of these approaches, which is to allow (or even actively encourage) creativity in our academic writing and research endeavours. I have come to the conclusion that in order to preserve the *value* of academic writing we need to focus on our humanity — on the parts of ourselves that AI tools can not mimic or replicate. I think one of the major contributions of my thesis is the way it paves a path forward for a new and *different* form of master's thesis, one that is deeply and unquestionably human. Sure, it may be a bit messy, it may have some flaws, and you may not like it or what I have to say — but it's full of my *original* perspectives, observations, and reflections. I still worked within a thesis structure, cited my sources, and contextualized my findings within relevant scholarship, but I did so using my critical thinking skills *and* my creativity in equal measure.

Will this approach work for all disciplines and all members of the academic community? No, of course not. It would be ridiculous to expect to find *one* way of academic writing that could apply to the study of all things... wouldn't it? (In case you're missing it, there is most definitely a thin layer of sarcasm and a hint of irony hidden somewhere in the last sentence). So just to clarify even further... No, I don't believe encouraging creativity is the only way to preserve the value of academic writing, but I do think it's *one* of the ways. Finding those other ways will involve further exploration, maybe by another tired master's student, an excited first-year bachelor's student, a passionate post-doc or distinguished professor. It's likely these people will come from different disciplines, with diverse perspectives to share.

So yes, I fully acknowledge that this approach won't work for many disciplines, and that there continues to be value in using academic terminology for the sake of efficiency and clarity. I am merely suggesting that there be space to open a dialogue around the nature of academic writing, and how it might be adapted to better tackle the growing challenge of ambiguous authorship due to the influence of AI tools. Right now questions and concerns about the current and future impact of AI tools are rippling through the entire academic community (just look at the random list of journals in my references if you don't believe me). It's a rare occurrence that brings that many voices to the same table, and I challenge you to stay both open and critical to what they have to say.

### **Some Extra Thoughts on My Trip to Wonderland**

Now that I've finished moralizing on the potentially turbulent times ahead for academia, I think it's time to address a possible elephant in the room. I started this chapter acknowledging that I didn't have a concrete thesis question when I started writing. You might be wondering, now that I've figured out the big questions in this thesis, what's to stop me from going back and changing my introduction to reflect that knowledge. That would certainly make it more of a "proper" introduction, and therefore more of a "proper" thesis. The simplest (and maybe slightly childish) answer is — I don't want to, because it wouldn't *feel* right.

I'm starting to realize that is one of the fundamental principles of this methodological approach — being open to where the process takes you and not relying on preconceived notions of what is *supposed* to be, or how things are *supposed* to be done. A big part of this journey is that it's been almost entirely chronological. I've written it from start to finish, and you as the reader have been along that same journey with me. I think that's part of what makes it exciting to write (and hopefully read). During the process of writing there were some instances where my perspective changed, and in these cases, I've done my best to include that openly as part of this journey. For example, the start of this chapter was re-written a few times while I struggled to figure out why I wasn't able to write this as a normal discussion chapter. If I go back and change major parts of this thesis, I also lose this overarching narrative.

The next logical question becomes — What is the academic value of this narrative? You might be wondering why I'm only asking this question now, and not as part of my methodology section. As I've said, this process was chronological and I have been deeply immersed in the writing process. It's only been during this chapter that I've taken the

opportunity to step back and look at the bigger picture of what I've learned by writing (to it) as a method of inquiry. The term "narrative" may have seemed obvious to you while reading this thesis, but as the reader you have the advantage of an outside perspective (you are outside looking in on my writing process). I am *inside* the process — my face pressed against the pages — and I've been so caught up in the writing process that there's been no time or space *outside* to reflect until now (and similar to the White Rabbit, I've been late for a very important date).<sup>165</sup>

So is this thesis a narrative? I asked ChatGPT to: Please give a definition of narrative in one sentence. To which it responded, "A narrative is a structured account of connected events presented through story form, typically featuring elements such as characters, setting, plot, and a sequence that imparts meaning or insight."<sup>166</sup> By this definition, I'd say no. This thesis is still first and foremost a *master's thesis* (at least in structure), though I would say it has narrative qualities due to my (mostly) chronological approach and use of the first person. The next question is whether the term "narrative" can be used in an academic context, to which the answer is yes.

There's a small chance you might remember that this word already came up in Chapter 3 in the context of a "narrative experiment" in an article by Dave Yan.<sup>167</sup> At the time I read Yan's article, his use of the narrative experiment felt too abstract when compared with what I was trying to do in this thesis. He says, "This narrative experiment begins and develops in a multiplicity of situations and research orientations that unfold themselves throughout the remainder of the text."<sup>168</sup> So what does that actually mean in the context of this article? Basically, he created an imaginary professor that he named Frank (who is actually ChatGPT) and had what I would call an *artificial collaboration* in the form of a back-and-forth dialogue. I found that it was very "out there" and, while I appreciated his attempt to try something new, it definitely didn't resonate with the approach I was taking in this thesis (and it's why I didn't invite him to my tea party).

However, reaching this point in my thesis I decided to re-examine the concept of "narrative experiment" and I've asked both ChatGPT and Gemini to give a definition.

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<sup>165</sup> This line from the White Rabbit is from the film adaption of *Alice in Wonderland*. Clyde Geronimi, Wilfred Jackson, and Hamilton Luske, dirs., *Alice in Wonderland* (1951; Burbank, CA: Walt Disney Productions, 1951).

<sup>166</sup> Using the prompt: Please give a definition of narrative in one sentence.

<sup>167</sup> Yan, "Posthuman Creativity," 1-12.

<sup>168</sup> Yan, "Posthuman Creativity," 2.

Prompt: Can you summarize narrative experiment in one paragraph?

ChatGPT-4:

A narrative experiment in academia is an innovative research approach that utilizes storytelling techniques to explore and convey complex human experiences. This method combines elements from various disciplines such as literature, sociology, and psychology to capture the richness and subjectivity of personal and collective experiences. By presenting findings through narratives, researchers aim to make their work more engaging and accessible, enhancing its impact beyond traditional academic audiences. This approach emphasizes the meaning and interpretation of experiences, often involving creative formats and careful ethical considerations regarding participant representation.

Gemini Advanced:

A narrative experiment in research is a methodological approach that utilizes storytelling techniques to present findings or explore complex ideas, often departing from traditional academic writing styles. By incorporating elements like personal narratives, fictionalized accounts, or reflective essays, these experiments aim to engage a wider audience and evoke emotional responses, fostering deeper understanding and connection with the subject matter.

This description does fit my approach well in some ways, as I am “departing from traditional academic writing styles” by using some “storytelling techniques” to “foster deeper understandings” and create a “more engaging and accessible” experience. So perhaps it’s possible to say this thesis *is* a form of narrative experiment?

Okay so maybe this is a narrative experiment, but are there other academic uses of the term *narrative*? After digging a bit deeper into the term (by researching in Google Scholar and Oria) I also encountered the philosophical category of “narrative epistemology” (which I will once again use ChatGPT and Gemini to summarize).

Prompt: Can you summarize narrative epistemology in one paragraph?

ChatGPT-4:

Narrative epistemology is a philosophical approach that views knowledge as fundamentally shaped by narratives and storytelling. It challenges traditional epistemologies that prioritize objective reasoning and empirical evidence, proposing instead that our understanding of the world is deeply influenced by the stories we tell and hear. This approach emphasizes that knowledge is constructed within personal and cultural contexts, communicated through stories that organize events in coherent sequences and embed moral insights. By highlighting the subjective and context-dependent nature of knowledge, narrative epistemology acknowledges the importance of personal and cultural narratives in shaping identity, ethical understanding, and our broader comprehension of the world.

Gemini Advanced:

Narrative epistemology posits that knowledge is not solely acquired through logical reasoning and empirical evidence, but also through stories and narratives. It emphasizes the significance of narrative structures in shaping our understanding of the world, ourselves, and others. This approach suggests that narratives provide a framework for interpreting experiences, making sense of events, and constructing meaning. By recognizing the epistemic value of narratives, we gain a deeper understanding of how knowledge is acquired, shared, and transmitted within various cultural and social contexts

I feel comfortable saying that the approach I've been using throughout this thesis — writing (to it) as a method of inquiry — fits within the category of “narrative epistemology”. If I were to bring back my tea party metaphor... narrative epistemology *is* Wonderland — the world in which narratives can be used to discover and construct knowledge, and the narrative experiment is my tea party — a collaborative and experimental place to bring together different voices to shape my new approach. As a reminder that this is still an *academic* thesis, I could also say that “narrative epistemology” is my theory and my methodological approach is the “narrative experiment”. I could say that... but I won't.

It's not because these labels don't fit, because they do in a general sort of way. It's just that putting everything I've done so far into a single theory or method box goes against a key aspect of my approach. To echo the voices of my March Hare (Honan) and Dormouse (Bright), I'll bring back this quote from Deleuze, “the problem is not to direct or methodically apply a thought which pre-exists in principle and in nature, but to bring into being that which does not yet exist...”<sup>169</sup> So instead of just slapping the labels of “narrative experiment” or “narrative epistemology” over this thesis, I will instead incorporate these terms into the ever-expanding and ridiculously long name of *my* methodological approach — narrative epistemological experiment of writing (to it) as a method of inquiry. Seeing how ridiculously long this name has gotten, I'm taking inspiration from Nakadai et al.'s, “WEIRD”, and creating my own acronym — NEEWI (Narrative Epistemological Experiment of Writing (to it) as a method of Inquiry). Yes, I agree that even though it's shorter, it's still quite silly... and I hope to find a better name as I explore this methodology further outside the scope of this thesis.

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<sup>169</sup> Deleuze, *Difference and Repetition*, 147.

## Acknowledging Limitations

Usually this is the part where I'm supposed to acknowledge that I — a human being with biases — wrote an academic paper that is supposed to be objective (and therefore should not have biases). This basically amounts to saying “I'm sorry I'm not *actually* a robot, despite doing my best to sound like one.” Of course it's quite clear that I wrote this thesis, but I will happily state for the record that I am a flawed human with biases. One of the biggest challenges with biases is that it's difficult to know what they are, so it's hard to say *exactly* how mine have “contaminated” the content of this thesis. If I were to hazard a guess, it likely involves being from, and studying in, a WEIRD (Western, educated, industrialized, rich and democratic) place.<sup>170</sup>

Arguably, one of the challenges to my NEEWI approach, is that it makes it much harder to identify one's biases or maintain an objective stance. This is certainly one of the criticisms I've seen in my brief foray into the scholarship on the “narrative experiment”, and likely one of the reasons it has not been more widely adopted in academia. Of course I understand and support the scientific importance of striving for the objective truth. However, I do believe that there could be a middle ground where we acknowledge that, regardless of the field of study, all content is *subjective* if it's made by a human (whether you're a microbiologist or a sociologist). In certain disciplines there is more acceptance of this subjectivity (e.g. it's one of the first things you learn as an anthropologist), however, this is certainly not the case for most of STEM (Science, Technology, Engineering, Mathematics).

I'm not encouraging a complete disregard of the scientific method, as I believe the pursuit of objective truths is a vital part of academia. However, I also know it's impossible to say whether any given truth is *objective* because we experience the world *subjectively*. As scholars we have given ourselves a task to rival Sisyphus. As humans who can only ever access the world through our subjective experiences, we still work tirelessly toward the unachievable goal of objectivity... and even if we do happen to stumble upon objective truths we have no way of *objectively* recognizing them. So we do our best to collect as many truths about the world as we can, in hopes that at least some of them contain that elusive quality of *objectivity*.

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<sup>170</sup> Yes, I'm borrowing the term from Nakadai, Nakawake, and Shibasaki, "AI Language Tools Risk Scientific Diversity," 1804-1805.

Well that got quite a bit more philosophical than I planned... To put it a bit more simply, if we are able acknowledge this illusion of academic *objectivity*, it becomes possible to give ourselves a voice to share our *subjective* experiences while we continue to work towards these (unattainable) objective truths. So while it's possible to argue that my methodological approach is too *subjective* to fit within the “*objective*” academic corpus, it's also entirely possible this thesis does contain objective truths... I just don't make any claims to know them as such.

Let's move on to another more simple limitation of this thesis... which is that it explores the uses of a constantly developing technology — AI tools. Meaning that many of the references, observations and concerns I raise in this thesis may already be outdated by the time you read them (in the coming weeks and months). This is arguably one of the great challenges of researching and writing about AI tools, because the content you produce will be obsolete possibly before it's officially published. That's why the majority of sources I used for this thesis were published between 2022 and 2024, because anything published on Generative AI before the release ChatGPT was no longer useful for academic discussions. While some of this thesis may also be obsolete soon, I do believe that I've identified some broader themes and concerns in regards to creativity, authorship, and originality that will continue to be relevant as this technology develops.

The other point I'd like to address here isn't exactly a limitation, but something I still want to take time to address. This was a theme I encountered when I started researching AI tools, but it was not emphasized as an area of discussion in the sources I used in my literature review. Specifically, the environmental cost of using AI tools is problematic to say the least.<sup>171</sup> This is a topic deserving of at least a thesis, maybe a few books, a podcast, and the implementation of some serious international environmental policies and regulations. There has been some scholarly discussion on the environmental costs of AI, but not much has been written specifically about AI tools (in part because of their novelty). When I say environmental cost, the biggest components of that cost is the energy it takes to run the data centres that house the AI tools (and the data they are trained from), and the amount of the water that is required to prevent these data centres from overheating.<sup>172</sup> The data centres used

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<sup>171</sup> Bender et al., "On the Dangers of Stochastic Parrots," 610-623; Mehan, *Artificial Intelligence*; Roy Schwartz et al., "Green AI," *Communications of the ACM* 63, no. 12 (2020): 54-63.

<sup>172</sup> A. Shaji George, AS Hovan George, and AS Gabrio Martin, "The Environmental Impact of AI: A Case Study of Water Consumption by Chat GPT," *Partners Universal International Innovation Journal* 1, no. 2 (2023): 97-104.

for these tools are already contributing to the ongoing climate crisis, and there are major concerns about what the increasing popularity of AI tools (and therefore the increasing demand for more data centres) means for the future of our environment.

Currently there has been some increased efforts to improve the “energy efficiency of data centres through the use of more energy-efficient hardware and the implementation of water-saving cooling technologies.”<sup>173</sup> The problem is that those type of measures alone will likely not be enough, especially when most Big Tech companies are not exactly known for their environmental ethics.<sup>174</sup> Of course it’s not a completely hopeless situation — as humans we are excellent at making messes and then inventing new ways to clean them up. It’s certainly possible that just as technology is part of the problem, it can also become part of the solution. For example, just a few months ago a new paper was published in *Nature* titled, *A 3D Nanoscale Optical Disk Memory with Petabit Capacity*, which is basically an updated form of CD (also called an ODS - optical data storage) with a capacity of roughly 200 terabytes.<sup>175</sup>

In order to contextualize what that storage means I asked ChatGPT a few questions. I asked — What is the storage capacity of a regular CD? The answer was roughly 700 megabytes. While it’s obviously a big difference between those two numbers, it still hard to visualize what that difference means. The next question I asked was — How many plain text pages can you fit in 200 terabytes? The answer is approximately 100 billion pages. In the context of AI tools, that is a *lot* of training data. According to the authors, “Optical data storage (ODS) presents a promising solution for cost-effective long-term archival data storage.”<sup>176</sup> The reason it’s a cost-effective and good long-term option is because it’s incredibly easy to store CDs - they are small, have no constant need for energy and are relatively durable. Of course they are also closed units unless you put them in a device that reads the information (e.g. a CD player) which would still require energy. However, these ODS’s still have impressive implications for the current challenges we have storing data, and there is likely a lot of information cluttering data servers that could be archived this way.

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<sup>173</sup> George, Hovan George, and Martin, "The Environmental Impact of AI," 97-104.

<sup>174</sup> Just think of my previous example of conflict mining for smartphones example in Chapter 2.

<sup>175</sup> Miao Zhao et al., "A 3D Nanoscale Optical Disk Memory with Petabit Capacity," *Nature* 626, no. 8000 (2024): 772-778.

<sup>176</sup> Zhao et al., "A 3D Nanoscale Optical Disk Memory," 772.

All this is to say, the environmental costs surrounding AI tools is a complex issue, and it's one that affects us all. We already know that AI tools come with steep environmental costs, and their rapid evolution requires a continuing increase in computing power. When this is paired with a steady increase in the number of users, it's hard to see how our environment will not also feel these increasing demands. From where I'm standing, things don't look good. However, all hope is not lost, as I also know that when we harness the powers of our creativity and critical thinking skills we have been able to solve many of the problems we have made for ourselves. This is one more area where we'll have to wait and see how things unfold.

### **Suggestions for Further Scholarship on Creativity and Terminology**

I think the relationship between AI tools and creativity is one of the most interesting areas of research right now. I don't mean whether AI tools are creative or not. I already outlined in Chapter 4 that I agree with Runco that they are not capable of true creativity, and that's why it's important to differentiate using the term *artificial creativity*. I'm very interested about the impact these tools will have on both enhancing and hindering our *human* creativity.

When it comes to the positive potential of AI tools, during this thesis I identified two ways they can be helpful. The first was as a way to conquer "blank page" paralysis — instead of staring at a blank page waiting for inspiration to strike, it's now possible to start your creative process by asking a question. Even if I didn't end up using them, I still found that just knowing these tools were there if I needed them took off the mental pressure and made it easier to start. The "blank page" syndrome is a psychological one, so it makes sense that having the equivalent of a creative safety blanket can be useful at overcoming this paralysis.

The second way I found these tools helpful was by harnessing what I termed the *power of the negative*. Simply put, by showing you where you don't want to go, these tools can help you discover where you want to end up. They do this in a way that demands nothing from you but to ask questions. Even better, they don't even have to be the "right" questions, and they can still help you get closer to where you want to go. This freedom to *not* know takes so much psychological pressure out of the exploration process, because when using AI tools you are free to ask any and all questions you can think of with no social pressures telling you "Hurry up!", or "Get to the point!", or "Stop asking so many silly questions!" These tools can provide an (artificial) level of patience we almost never get as adults, and often even struggle

to show children. Traditionally academia is a place where it is embarrassing (even shameful) to be wrong or not know something, and that pressure can definitely negatively impact our ability to be creative. With AI tools there is no judgment and endless patience, which I would argue are two important factors in promoting creativity. Future research into the psychological impact of AI tools on human creativity can help us to better understand the best ways to harness their power.

What is arguably of greater importance is understanding the *negative* impact these tools can have on our creativity. As I brought up in Chapter 4, there is a concern that reliance on AI tools will end up creating a form of informational “genetic drift”. I used a sci-fi example that built on this biological analogy, but over the course of writing this thesis I came up with a more useful example. It came from the idea that using AI tools turns you into an editor, a sculptor of content... or a solver of puzzles. This process of prompting AI tools is like collecting puzzle pieces, and the challenge is finding the right ones to snap together. AI tools like ChatGPT and Gemini can be understood as puzzle boxes, that are filled with an almost endless number of pieces that can be collected using the right prompts and then used to create a new picture.

We’ve created a puzzle box with an increasing number of puzzle pieces (with each update) that can be combined in an almost infinite number of ways — how could this possibly lead to an information “genetic drift”? Simply put, because it’s still a box. This is problematic for (at least) two reasons, the first is that this box is a fixed container of information being trained on existing data, and if that existing data starts to also be produced by that same box you end up with the *AI loop*. The second issue is that it provides you with only one way to access, collect and use data... so to keep the analogy going you are limited to only making puzzles. As I’ve been working to show over the course of this thesis, there are many ways of discovering information — and my NEEWI approach is just one. Making a puzzle from the box is also just *one* other way.

The true danger is if it becomes the *only* way. Human creativity (as I’ve already touched on in Chapter 4) is one of our most fundamental and powerful abilities, and it’s limited only by one’s imagination. We have so many ways of learning about these things, and we’ve created systems to improve this process. We have the academic structure, the scientific method, the pursuit of objective truth. We also have our subjective experiences, the depth of

our feelings, and our desires to share and connect through art and culture. It's a truly admirable thing. Now imagine we ignored all of this potential and instead told people that the only way to create, invent or discover was by making puzzles from a box. Through writing this thesis I have seen the potential for these tools to erode our creativity and trap us into an *AI loop* of our own making. This is why I believe it's absolutely vital that further research is done to better understand these dangers (and continue to find new ones), because it's the only way we can avoid falling into these intellectual and creative traps.

One other aspect that I identified as incredibly important to the future of AI tools in academia is the need for updated terminology. I was able to fully understand the scope of this challenge when looking into AI and creativity, and realizing that the current definitions would allow us to attribute creativity to these tools. The same issue popped up again in regards to definitions of authorship and originality. Over the course of this thesis I have contributed my own suggestions to updating terminology, including:

1. *Artificial Collaboration* is the process of using AI tools. This term builds off of Runco's *artificial creativity*<sup>177</sup> and keeps the accountability fully on the user by emphasizing that these tools are not *people* who are able to provide a true collaboration.
2. *Edaiting* is a challenge of Sidorkin's term "wraiting"<sup>178</sup>, because I argue the process of using AI tools is more similar to editing than writing.
3. *Information Contamination* is when AI tools provide incorrect answers by including information from previous prompts.
4. *AI loop* is when the content that is produced by AI tools is then fed back into them, creating a closed loop with no *original* human content.

These are some possible contributions to the increasing need for updated terminology to discuss the future of AI tools. You may or may not agree with these terms (similar to the way I felt like challenging Sidorkin's definition), but that is the power of academia... the ability to negotiate a new concept through a process of debate. Okay, but why is this so important? Because having updated and accurate terms for describing the processes surrounding AI tools will help us not lose sight of the ethical implications. Specifically, it can help us to stay transparent and accountable when using these tools, and at the same time better understand the ways they influence us, both academically, and in our everyday lives.

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<sup>177</sup> Runco, "Updating the Standard Definition," 4.

<sup>178</sup> Sidorkin, *Embracing Chatbots in Higher Education*, 1.

## Future Predictions

I know it's a question on many scholars' minds — What does the future of academia look like with AI tools? When I wrote my introduction, I had hoped that I might have some future predictions to share in this chapter. The more I've understood these tools and how rapidly they are evolving, the less comfortable I feel making any strong predictions. To me, prediction implies a degree of certainty of what will happen. Instead, the most I will do is give a *forecast* for the future of academia using the things I've learned. This is my best estimation of what could happen based on the perspectives I have right now, but as with any forecast this could easily change.

My most basic forecast is that most people in academia (students, professors, administrators, etc) will either keep using or start using AI tools. They are incredibly useful for a variety of tasks, and they are also continuing to improve with each passing day (so I won't bother trying to forecast all the potential uses). In this thesis, I've used them creatively, for summarizing, synthesizing and simplifying sources, and this is the tip of the iceberg. Just as these tools continue to evolve, so will our understanding and expertise in using them. The strongest suggestion I have to both students and educators in academia is to learn about these tools and understand their potential impact on your field of study. As educators, it is incredibly important to have a balanced approach that incorporates different ways of using AI tools, while also teaching about the associated risks, dangers, and ethical dilemmas of using them.

One of the biggest challenges I see ahead is for the administrators involved in the bureaucracy of academia... your job is by far the hardest. In order to be able to effectively and ethically maintain academic standards surrounding the use of AI tools, you will need to do the one thing that bureaucracy hates — be efficient. And also quick... okay, so it's two things. As I've stated (what feels like a million times at this point), these tools are constantly evolving at a pace so rapid it's hard to fully grasp, and I don't know how much hope there is for administrators to keep up. I think the best they can do is to not fall *too* far behind, and likely the only way they can do that is to also start *using* these tools. But in order to do this responsibly, administrators will need to be educated on *how* to use them, while avoiding the biggest dangers (for example, threats to data privacy and security). The other way for them to stay relevant and effective, will likely involve asking outside experts (ideally from multiple

backgrounds) to help craft continuously updated guidelines, regulations, and policies for using these tools.

So what are the biggest dangers to keep in mind when learning, teaching or administrating on the uses of AI tools in academia? First and foremost, the issue of the “black box” and how that makes it incredibly hard, or at times impossible, to maintain accountability and transparency when using AI tools. I think a small way to challenge this “black box” is to understand how these tools actually work — meaning the mechanism behind generative AI and specifically large language models (LLMs). The owners of these AI tools (like OpenAI and Gemini) are working very hard to make the process of interacting with them feel seamless and also very *human*. The latest update to ChatGPT-4o included a dramatic improvement to its speech abilities, and the process of prompting can now feel like you’re talking *with* someone rather than *to* a tool. That’s why it’s becoming increasingly more important for people (and I do mean everyone and not just academics) to understand how these tools actually work. When you understand that the tools do not demonstrate true intelligence or consciousness, but instead operate using pattern recognition and mimicry, it becomes much easier to stay critical of the content they produce.

As I’ve already mentioned in Chapter 6, this “black box” also makes it easier to spread misinformation because they can produce incorrect content either through hallucination, or as I discovered, through a form of *information contamination*. It’s possible to prevent this from happening by understanding how to use these tools properly, and by maintaining a high level of human oversight (so don’t be lazy and check your content for accuracy). There is still the challenge of ignorance (and I don’t mean that term in a negative way), which is simply that you don’t know what you don’t know... and therefore it won’t always be possible check for accuracy. The only thing we can do in those instances is to be aware of the limits of our knowledge and be *extra* critical of the content we use when learning from AI tools.

The next challenges to keep in mind are not threats posed by the tools themselves, but by those who control them. As I briefly went into in Chapter 6, Big Tech does not have a good track record for respecting the privacy or security of our data. They operate with a capitalistic drive that involves using our data in any way that will make them money — either indirectly

through targeted ads or directly by selling it to the highest bidder.<sup>179</sup> As I've discussed, the "black box" can also make it incredibly challenging to determine the source of the information you receive, and can often lead to plagiarism or instances of copyright infringement. So when you give a prompt to AI (especially when not asking for sources) they can use people's idea to create new (though arguably derivative) content, and they will get no credit or recognition for their intellectual property. This can quickly turn into a challenge to "own" our own thoughts, ideas and creations. This is problematic on many levels, though especially because this is one of the currencies of our current society, whether you're an academic, an artist, or a business consultant.

This problem of ownership and plagiarism is not just limited to content being produced by AI tools, but also applicable to the data we put into them. In Chapter 6, I did my best to find out what happens to the data given to AI tools, and whether we maintain any degree of ownership of those ideas. All signs were vague and pointed to "no". The lack of accountability and transparency on the side of Big Tech is deeply concerning, and it becomes more than a little suspicious when they give vague answers to important questions. It's one thing to hide things in the fine print, but it's another thing entirely to also try to *hide the fine print*. We can't count on Big Tech to regulate themselves or follow ethical guidelines (as they continue to prove), which is why anyone using AI tools needs to be *aware* of these great risks... because they certainly won't be the ones to tell you.

These tools are an incredible disruptor and have been released into the world with what I would argue is minimal control, and a capitalistic disregard for the ethical ramifications (because who cares if we keep making money?). One of our biggest (and arguably most daunting) tasks is to protect ourselves, which now extends beyond our data to our thoughts and ideas — our intellectual and creativity property. Within academia, one of the ways we can do this is by promoting awareness of these risks through proper education, and by working to stay up to date on appropriate guidelines, policies and regulations. Outside of academia, we have to rely on our systems of government to provide the necessary legislation to protect us from the insatiable hunger of Big Tech. Thankfully, the European Union (EU) is leading the charge, and as of March 2024, its parliament has passed the first comprehensive legislation to

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<sup>179</sup> One of the more recent cases I stumbled across was Facebook giving Netflix access to data on their users including their private messages. Naveed Iqbal, "Meta Quits Streaming And Gives Access to FB DMs to Please Netflix," *The Tech Report*, March 31, 2024. <https://techreport.com/streaming-news/meta-quits-streaming-and-gives-access-to-fb-dms-to-please-netflix/>

regulate AI tools, titled the AI Act.<sup>180</sup> Of course this is not a solution, but rather a first step in the right direction, and already both academia and Big Tech have things to say about it.

In a recently published article, Stephen Gilbert stated “The wording of many aspects of the Act is ambiguous, and often high-level objectives are stated, with the detail to come later in associated guidance, standards, and member state law and policy.”<sup>181</sup> While not exactly a critique, this does highlight that this legislation is the first step on a long road. In another recently published new article, “Amazon and Meta executives told CNN this week that some of the fears about artificial intelligence are overblown and that the European Union’s sweeping new AI rules risk holding back innovation.” This article contains some direct quotes from Yann LeCun who is the AI chief at Meta, which includes:

“There are clauses in the EU AI act and various other places that do regulate research and development. I don’t think it’s a good idea.”

“But today, trying to figure out how to make future super-intelligent AI systems safe is like asking in 1925 ‘how do we make jet transport safe?’ And jet transport was not invented yet,” he said.”<sup>182</sup>

So by his reasoning we have an almost impossible task when trying to figure out how to make the future of AI systems safe, and yet it’s not a good idea to even try. Apparently Big Tech is so confident in their position of controlling AI tools that they feel comfortable flaunting their blatant ethical disregard for our safety. That’s just great. To make a classical reference, I only hope this hubris will be suitably rewarded (or if you’re feeling more biblical... that this is the pride before the fall).

I know what I’ve outlined above might feel a bit dramatic (or downright depressing), but based on the things I’ve learned from writing this thesis, it’s hard not to come off sounding like a soapbox preacher or a total Cassandra (to keep the classical theme going). I’m not saying these tools are evil or inherently dangerous, though I know that in the hands of Big Tech it’s easy to feel like they are a Pandora’s box (to give one more classical reference) filled with the evils of the world, with very little hope to be found. However, this Pandora’s

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<sup>180</sup> European Parliament, "EU AI Act: First Regulation on Artificial Intelligence," News, June 1, 2023, accessed May 24, 2024, <https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence>; Future of Life Institute, "EU Artificial Intelligence Act," EU AI Act, accessed May 24, 2024, <https://artificialintelligenceact.eu/>.

<sup>181</sup> Stephen Gilbert, "The EU Passes the AI Act and Its Implications for Digital Medicine Are Unclear," *npj Digital Medicine* 7 (2024): 135.

<sup>182</sup> Sara O'Brien, "Meta, Amazon Warn of AI Regulation Impact Amid EU's New Law," *CNN*, May 24, 2024, accessed May 24, 2024, <https://edition.cnn.com/2024/05/24/tech/meta-amazon-ai-fears-eu-law/index.html>.

“puzzle” box is filled with pieces (datasets) that are a sample of humanity, including our capacity for both good *and* evil. I know I’ve talked about the ways these tools can enhance creativity (which is quite abstract) or help with boring tasks (something useful), but based on these examples it might be hard to see what “good” they can actually do. For that reason, I figured I would try to end this chapter on a slightly more hopeful note using a “good” example of AI tools.

A study published last year in a medical journal showed that ChatGPT was judged by patients to be more empathetic than doctors when answering questions on an online forum.<sup>183</sup> You might be thinking, “Wait, how is this a *good* example?” While the initial thought is that this study is showing that doctors are lacking in empathy, that’s not the point. I don’t think we have a big issues with our doctors, but rather that we have trained our AI chatbots to use empathetic responses and trained our human doctors to be as objective and unemotional as possible. That training is not without reason, being a doctor means dealing with human suffering *all* the time, and in order to not drown in that suffering the education system often encourages them to maintain a degree of emotional detachment.<sup>184</sup> The point is that we have trained our AI to be empathetic, and that’s only possible because the sample of humanity it was trained on includes our capacity for empathy.

It’s important to point out that what’s impressive is not that AI has the capacity to mimic human empathy, but that when real humans interact with these chatbots they are able to perceive (and arguably feel) a level of empathy in the responses given. So why is this good news? Simply put, this study sets a precedence that AI tools like ChatGPT and Gemini could be used in the development of AI mental health support. This support would be accessible to everyone, and more importantly *affordable*, both of which are currently major barriers to receiving mental health care.<sup>185</sup> You may now be wondering, “Why on earth are we talking about the potential uses of AI tools in mental health care when this is a meta-thesis on academic uses of AI tools?” In this section I have looked at the balancing act that academia will need to do moving forward in order to be able to realistically *and* ethically implement and also govern the use of these tools. One of these potential uses may be in providing accessible

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<sup>183</sup> John W. Ayers et al., “Comparing Physician and Artificial Intelligence Chatbot Responses to Patient Questions Posted to a Public Social Media Forum,” *JAMA Internal Medicine* 183, no. 6 (2023): 589–596.

<sup>184</sup> Angeliki Kerasidou and Ruth Horn, “Making Space for Empathy: Supporting Doctors in the Emotional Labour of Clinical Care,” *BMC Medical Ethics* 17 (2016): 1-5.

<sup>185</sup> Nicholas C. Coombs et al., “Barriers to Healthcare Access Among U.S. Adults with Mental Health Challenges: A Population-Based Study,” *SSM - Population Health* 15 (2021): 100847, <https://doi.org/10.1016/j.ssmph.2021.100847>

and affordable mental health care to students. Thankfully in Norway, or at least at the University of Oslo, there is a solid support system in place to help students. In other countries, this is most definitely not the case. There is a long history of research documenting the struggles of students with their mental health.<sup>186</sup> As I've alluded to over the course of this thesis, last year was a difficult one for me and my leave of absence was a result of both mental and physical factors. So you might say this is a topic that hits close to home...and yes I can then acknowledge this as a potential bias for why I chose this example. However, if you put aside my personal bias, I hope you can still see the positive potential for using AI tools as an additional or supplementary form of mental health support for students—one that is both accessible and affordable.<sup>187</sup>

We've made it to the end of this strange and very untraditional "discussion" chapter, and I can truly say I was not prepared for how challenging it would be to write. I've outlined some of the difficulties of why the meta-approach doesn't make for the easiest discussion. One of the additional challenges I didn't anticipate was that my NEEWI approach has allowed me to continue discovering new ideas and perspectives in the chapter where I was only supposed to discuss them. Only one more chapter to go, so here's hoping I can stick the landing.

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<sup>186</sup> Jenny K. Hyun et al., "Graduate Student Mental Health: Needs Assessment and Utilization of Counseling Services," *Journal of College Student Development* 47, no. 3 (2006): 247-266; Kara Zivin et al., "Persistence of Mental Health Problems and Needs in a College Student Population," *Journal of Affective Disorders* 117, no. 3 (2009): 180-185; Nicholas C. Coombs et al., "Barriers to Healthcare Access Among U.S. Adults with Mental Health Challenges: A Population-Based Study," *SSM - Population Health* 15 (2021): 100847, <https://doi.org/10.1016/j.ssmph.2021.100847>; Paola Pedrelli et al., "College Students: Mental Health Problems and Treatment Considerations," *Academic Psychiatry* 39 (2015): 503-511; William E. Copeland et al., "Impact of COVID-19 Pandemic on College Student Mental Health and Wellness," *Journal of the American Academy of Child & Adolescent Psychiatry* 60, no. 1 (2021): 134-141.

<sup>187</sup> Of course, I'm not saying this would be an easy task, as it would involve an incredible amount of regulation to maintain the necessary level of ethical and safety standards.

## CHAPTER 8: Conclusion

What an unexpected journey that's finally coming to a close! If you asked me even just two months ago whether I thought I would make it to this point, the best answer I had was, "I hope so." I also would have assumed I had AI tools to thank for making it this far with the time I had to write this thesis, and in some ways I do, as they served as a fertile ground of inspiration. They are a disruptive force in this world, and having the opportunity to explore this new frontier was exhilarating. It's not often you can write an academic thesis about what's happening in the present and immediate future. It's a true contrast to my last thesis topic, which was firmly rooted roughly five hundred years in the past. It's also a contrast to my last thesis writing experience, on a topic I liked but did not find particularly engaging... though I'm sure a global pandemic didn't help.

Writing this (meta)thesis was not at all what I expected it to be, first and foremost because it was a joyful, exciting, and deeply creative process. A little extra background about me, I love to create, make, and fix things — I paint, I sew, I do leather working, and I've even taught myself how to fix broken KitchenAid stand mixers. The one thing these examples have in common is they engage my creativity and critical thinking skills, and when I'm doing these things I am completely immersed in my endeavours. The psychologist Mihaly Csikszentmihalyi described this as a "flow":

Flow denotes the holistic sensation present when we act with total involvement... We experience it as a unified flowing from one moment to the next, in which we feel in control of our actions, and in which there is little distinction between self and environment; between stimulus and response; or between past, present, and future.<sup>188</sup>

Previously, I've been able to focus on my academic writing, but this thesis was the first time I was able to achieve a "flow" state. I knew this was the case because every time I stopped writing I had a strong urge to get back to it (similar to when I have an unfinished painting or a half-assembled KitchenAid stand mixer patiently waiting for my attention). This isn't a stressful place to visit, and it allowed me to write this thesis with a degree of productivity I could not have imagined. The past weeks have flown by in a haze of inspiration and new ideas.

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<sup>188</sup> Mihaly Csikszentmihalyi, *Flow and the Foundations of Positive Psychology: The Collected Works of Mihaly Csikszentmihalyi* (Dordrecht: Springer Netherlands, 2014), 136-137.


Of course, this is no comment on the *quality* of this thesis, because for all intents and purposes it could be awful. However, I've certainly left no room for doubt that *I* wrote the majority of this thesis. By choosing to challenge the standard of “traditional” academic writing I was able to open myself up to a NEEWI approach. Through this process I gained a continuously evolving perspective on AI tools and their implications for the future of academic writing. I was able to consider the philosophical nuances of creativity, authorship, and originality and the ways these tools impact these concepts —for better or worse.

I was able to explore the ethical discussions surrounding AI tools, and gained first hand experience on the importance of accountability and transparency when using them, and identified a further dimension of ethical importance — *awareness*. Testing these tools allowed me to see past the shiny veneer of a new technology and appreciate the very real dangers that they pose to the future of academia (in research, education and administration) with their ability to spread misinformation, plagiarize sources, and obscure the ownership of intellectual and creative property. I've also been able to identify areas for future research, including the impact of AI tools on the psychology of creativity, the potential dangers of the *AI loop*, and the increasing importance of having updated terminology to describe both the potential benefits and drawbacks of these tools.

When I first started writing this thesis I was convinced that I was finished with academia, and my only goal was to pass and get my degree. I am now considering the ways I can continue my research journey either within or, if necessary, outside the boundaries of academia. Over the course of this unorthodox thesis I have reignited my passion for academic research and discovered a newfound appreciation for the value of writing as a way to create, to discover, to reflect and to share. By giving myself a voice I have discovered more, and shared more of myself, than I could have imagined... and maybe more than I should have? Regardless, what's done is done. Just as this thesis is done. So if by reading this you were able to gain even a sliver of what I have gained while writing this, I will consider my experimental meta-thesis a success.

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