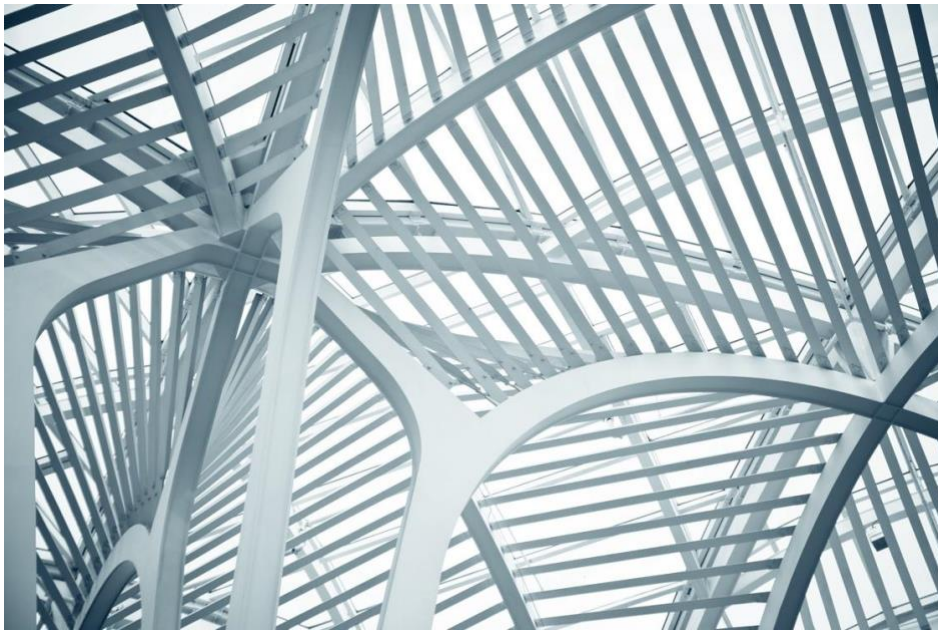


Adapting to AI Writing

Artificial Intelligence, Generative Ai, & Education
Dr. Isabel Pedersen



REPORT | VERSION 1.2, 30 MAY 2023

© 2023 Isabel Pedersen, All rights reserved

Contents

Executive summary 3

Introduction 4

Definitions 4

Basic process for using generative AI 5

Sample generative AI products 5

Generative AI: Why has it been so hyped? 6

ChatGPT has undergone a transformative rate of adoption 6

Generative AI is not factual 7

AI text classifiers and checkers exist but are not always accurate 7

Generative AI challenges traditional roles for writing 8

What are the main concerns about generative AI in postsecondary education? 8

Why is Generative AI writing proving to be a successful students' resource? 8

Why is Generative AI writing proving to be a successful Instructors' resource? 9

Canadian university policymakers do not have definitive answers 9

Creativity, generative AI, and postsecondary education 11

Instructors' adaptation to generative AI 11

Creative approaches 12

Course descriptions and learning outcomes on courses about AI ethics 13

Digital Life Institute 16

Relevant publications on AI writing, digital/AI literacy and human-AI teaming 18

References 19

Executive summary

This report summarizes activities, resources, and ideas on the topic of generative AI writing and its cultural adoption, with an emphasis on postsecondary education. It sheds light on how universities are adopting to generative AI as a phenomenon, and some of the reasons that adapting to AI writing is challenging in unique ways. AI hype is a significant factor in this first year of public access to the technology. The act of writing currently serves different cultural and professional roles, and it makes sense that the adaptation to generative AI will be heterogeneous. Users of emergent technology like generative AI go through a process of adaptation before settling into purposeful usage of it. The generative AI market will expand, and the focus in Education should be on learning frameworks first, not on specific products (e.g., ChatGPT, Microsoft Bing Conversational Experiences, DALL-E 2, etc.). Students should be involved in tools discovery and their feedback should be included in course policymaking. Adaptation to autonomous content generation tools will also be determined by instructors' points of view as teachers as well as their multiple professional roles as non-teachers. AI Literacy, digital literacy, critical media literacy, civic engagement, ethically-aligned adoption and assessment of writing tools will be needed for all people at any level in order to adapt to AI writing, appropriately.

Introduction

Definitions

Artificial Intelligence (AI)

Artificial Intelligence (AI) can be defined as “Systems that think like humans, systems that act like humans, systems that think rationally, systems that act rationally”¹. Concentrating on its cultural impact, another take is that “Artificial Intelligence (AI) is “the 60-year-old quest to make machines capable of mental or physical tasks seen as emblematic of human or animal intelligence”².

Artificial Intelligence often involves an autonomous agent that simulates human intelligence (e.g., a chatbot or digital assistant). Following Luciano Floridi (2013), Virginia Dignum (2019) defines autonomy as “the capacity of an agent to act independently and to make its own free choices”. She explains that autonomy “is both seen as a synonym for intelligence, as well as that characteristic of AI that people are most concerned about”³.

Artificial Intelligence (AI) comprises three main technological categories:

AI techniques: “advanced forms of statistical and mathematical models, such as machine learning, fuzzy logic and expert systems, allowing the computation of tasks typically performed by humans; different AI techniques may be used as a means to implement different AI functions.”⁴

AI functional applications: “functions such as [Natural Language Processing] or computer vision which can be realized using one or more AI techniques.”⁵

AI application fields: “different fields, areas or disciplines where AI techniques or functional applications may find application, such as transportation, agriculture or [Education], life and medical sciences.”⁶

Generative AI

A Generative Pretrained Transformer (GPT) is a type of large language model (LLM). It uses machine learning and specifically, deep learning to generate text that appears human-like. GPTs are called “generative” because “they can generate new text based on the input they receive, ‘pretrained’ because they are trained on a large corpus of text data before being fine-tuned for specific tasks, and “transformers” because they use a transformer based neural network architecture to process input text and generate output text.”⁷ In short, generative AI is predictive, it predicts the next word for a composition based on what it has previously seen.

AI Chatbots

ChatGPT and several other products are also referred to as AI chatbots using generative AI technology. These products are not to be confused with *virtual assistants*, like Apple’s Siri or

Amazon's Alexa, that also use AI and interact with people on their phones, laptops, or smartwatches. AI chatbots are programmed to 'converse' with people through written conversations by using the *question and answer* communication model, making them deliberately easy to use. One can also 'ask' that they generate an image or video, also called a 'prompt'. In sum, *AI chatbots* perform *AI writing*.

Basic process for using generative AI

Using generative AI involves these basic steps:

1. Choose a generative AI application on the Internet (e.g., ChatGPT)
2. Begin with a *prompt* in the form of a written question, an image, a video, or musical notes to instruct the application to return a result.
3. The generative AI application algorithms return newly composed content in response.
4. Content output can include text, essays, reports, syllabi, stories, poems, images, or videos, etc.

Sample generative AI products

autowrite <https://autowrite.app>

Character AI <https://beta.character.ai>

ChatGPT Plus <https://openai.com/blog/chatgpt>

DALL·E 2 <https://openai.com/product/dall-e-2>

Midjourney <https://www.midjourney.com/>

Stable Diffusion <https://stablediffusionweb.com>

Generative AI: Why has it been so hyped?

Few instances of media adoption have challenged the field of Education to the extent of Generative AI. The discourse touches on the end of human writing as a professional and artistic practice. While not everyone is concerned, people agree that it is evolving dramatically: “The appearance of ChatGPT in the academic sphere arguably represents the inevitable trajectory of human invention towards something that produces a more accessible and accurate understanding of the world.”⁸

ChatGPT has undergone a transformative rate of adoption

Data journalist, Katharina Buchholz (katharina.buchholz@statista.com) explains that “ChatGPT gained one million users just five days after launching in November of last year. The conversational AI bot that can produce human-like text has been put to all kind of uses, from writing short stories, prose, music and term papers to programming basic code, solving math problems and doing translations.”⁹

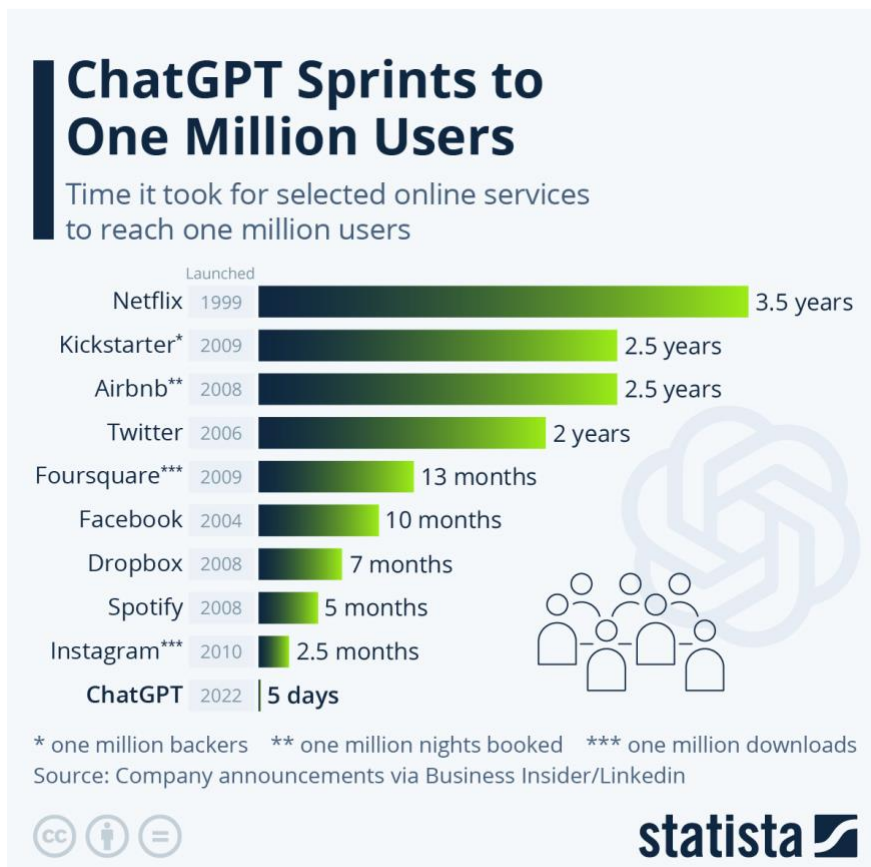


FIGURE 1 CHATGPT SPRINTS TO ONE MILLION USERS

Generative AI is not factual

“Even if researchers trained these systems solely on peer-reviewed scientific literature, they might still produce statements that were scientifically ridiculous” writes Cade Metz, 2023¹⁰. Generative AI generates hallucinations. *Hallucination* is a term circulating to describe a central issue with generative AI writing. “Large language models (LLMs) [hallucinate](#), a concept popularized by [Google AI](#) researchers in 2018. Hallucination in this context refers to mistakes in the generated text that are semantically or syntactically plausible but are in fact incorrect or nonsensical. In short, you can’t trust what the machine is telling you”.¹¹

AI text classifiers and checkers exist but are not always accurate

Text classifiers and checkers are meant to identify if a human or a generative AI product created written text. They are unreliable.

For example, OpenAI offers an AI Text Classifier describing it as “a fine-tuned GPT model that predicts how likely it is that a piece of text was generated by AI from a variety of sources, such as ChatGPT. This classifier is available as a free tool to spark discussions on AI literacy.”¹²

OpenAI provides a page on [Educator considerations for ChatGPT](#).

It discusses ChatGPT's capabilities, limitations, and considerations in educational settings, and information on [its documentation](#).

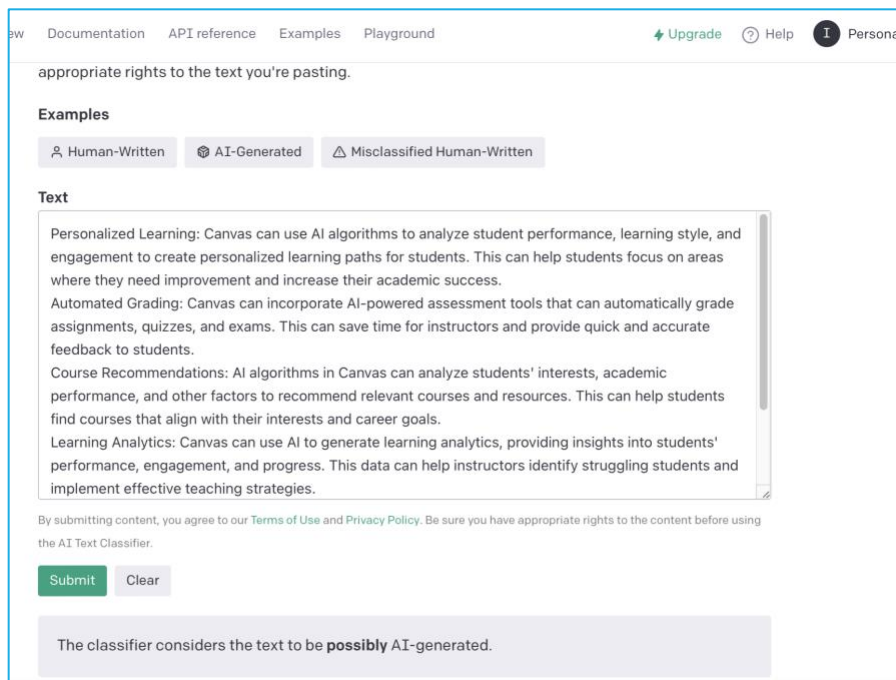


FIGURE 2 SCREENSHOT OF OPENAI'S TEXT CLASSIFIER, MISIDENTIFYING ITS OWN GENERATED TEXT AS “POSSIBLY AI-GENERATED” [HTTPS://PLATFORM.OPENAI.COM/AI-TEXT-CLASSIFIER](https://platform.openai.com/ai-text-classifier)

Company product policies

It is important to check generative AI product policies before using them in a learning setting. For example:

<https://openai.com/policies/usage-policies>

<https://openai.com/safety>

Generative AI challenges traditional roles for writing

Why is *writing* so important to traditional educational expectations? Why is it so challenging to imagine it could be automated?

Writing is important because it:

1. Operates as a primary means of communication for purposes of exchange (e.g., letters)
2. Serves as a form of art, functions to express creativity (e.g., novels, poems, essays)
3. Serves as a method for trusted record-keeping and credible documentation (e.g., journalism, contracts)
4. Functions to persuade, change opinions or incite action (e.g., sales, politics, ethos).
5. Serves as a tool for self-reflection (e.g., diaries)
6. Serves as a therapeutic tool (e.g., express trauma)
7. Serves as an apparatus for educating people and as a credible outcome of education (e.g., well-written documents across genres serve as proof of being educated)

What are the main concerns about generative AI in postsecondary education?

Generative AI writing is:

1. Vulnerable to bias, discriminatory and racist results, and online hate in the training sources
2. Factually incompetent, inaccurate and promotes false information and ‘hallucinations’
3. Not credible, does not always identify the source of its content or might fictionalize a source
4. Lacking in authenticity, originality, and creativity
5. Contributing to students’ academic misconduct, similar to plagiarism
6. Leading to dependency on AI and skills degradation (i.e., losing the ability to write)
7. Contributing to intellectual property issues, copyright issues with content
8. Leading to job loss, employment displacement, deprofessionalization

Why is Generative AI writing proving to be a successful students’ resource?

Generative AI can produce stylistically correct sentences, paragraphs, and documents across a multitude of genres. It can mimic human written conversation. Consequently, it can serve to help students to write, collaborate with other students, or complete writing tasks for students. It

can be used in myriad ways because *writing* is used systematically throughout all spheres of education.

Generative AI is slated to transform industries that students are studying to join.

- “Creative industries: Generative AI can be used to create original works of art, music, and literature. This could allow for the creation of new content at a much faster rate than is possible with human effort alone.
- Product design: Generative AI can be used to design new products based on a set of desired characteristics. This could lead to the creation of novel and innovative products that might not have been possible with traditional design methods.
- Medical research: Generative AI can be used to generate new hypotheses and ideas for medical research, which could lead to more rapid progress in the field.
- Marketing and advertising: Generative AI can be used to create new marketing and advertising campaigns based on a set of desired outcomes. This could allow for more targeted and effective marketing efforts.”¹³

Why is Generative AI writing proving to be a successful Instructors’ resource?

In addition to students, instructors are also adopting generative AI to help in numerous ways. The market will move in this direction to release more platform-based products that use generative AI tools for learning management systems. OpenAI explains why educators might want to use it: “Some examples of how we’ve seen educators exploring how to teach and learn with tools like ChatGPT”¹⁴:

1. Drafting and brainstorming for lesson plans and other activities
2. Help with design of quiz questions or other exercises
3. Experimenting with custom tutoring tools
4. Customizing materials for different preferences (simplifying language, adjusting to different reading levels, creating tailored activities for different interests)
5. Providing grammatical or structural feedback on portions of writing
6. Use in upskilling activities in areas like writing and coding (debugging code, revising writing, asking for explanations)
7. Critique AI generated text

Canadian university policymakers do not have definitive answers

University administrators, academic integrity offices, academic advising offices and faculty members are largely still adapting to the emergence of AI writing policy.

As an example, the University of Toronto posted a document called, *ChatGPT and Generative AI in the Classroom*¹⁵

“Updated: April 4, 2023

A Provostial Advisory Group on Generative AI in Teaching and Learning has been struck to identify areas in teaching and learning that require an institutional response or guidance. One

such example is providing instructors with sample language to include in their course syllabi to clarify for students if the use of generative AI tools for completing course work is acceptable, or not, and why. You can anticipate this language being available for you to use in course syllabi beginning in spring 2023. The Advisory Group will also inform the resources that will be created to aid instructors in better understanding this technology and options for how they may use generative AI in their teaching.

Decisions regarding the use of generative AI tools in courses will remain with instructors based on the type of course and assessments within them. Regardless of your stance on this technology, it is important that you discuss it with your students, so they understand the course expectations.”¹⁶

Creativity, generative AI, and postsecondary education

This section provides some resources and ideas about how to approach adopting generative AI in Education.

Instructors' adaptation to generative AI

Each instructor will need to respond to the use of generative AI in their own courses.¹⁷



Reactions, How do we respond to AI in Teaching?

1. embrace it
2. neutralize it
3. ban it
4. ignore it
5. [question it]

Who (or What) Wrote This? AI Content Generators in Higher Ed. Teaching and Curriculum Development Centre (TCDC) blog, Jan. 24, 2023
<https://iweb.langara.ca/tcdc/blog/2023/01/24/who-or-what-wrote-this-ai-content-generators-in-higher-ed/>

1. embrace it: Use these technologies in courses, assignments, and learning exercises.
2. neutralize it: Create assignments and learning exercises that cannot be completed by these technologies.
3. ban it: Deny the use of these technologies by forbidding their usage, might involve academic misconduct.
4. ignore it. Continue without altering course expectations, learning outcomes, assignments, or methods of assessment.

We add the need to *question it*. Emergent technology like generative AI, needs to be challenged by faculty members, administrators, and students for its ethical deployment in learning contexts.

Creative approaches

This [collection](#)¹⁸, *101 creative ideas to use AI in education* is a good source. It is edited by Chrissi Nerantzi, Antonio M. Arboleda, Marianna Karatsiori and Sandra Abegglen and provides useful examples for ideas. The contributors are educators and students, providing excellent curricular material to help people responsibly adopt and adapt to Generative AI in learning contexts. Below are some relevant examples of courses using generative AI from this source.

Using chatGPT to encourage critical thinking

Author: Katie Carpenter
Contact details: k.carpenter@leeds.ac.uk
Role (educator/student): Lecturer, historian
Institution/organisation: University of Leeds

My idea: Students on my public history module are set a 2000-word essay. Instead of giving them a standard essay, I typed the essay questions into ChatGPT and asked it for a short answer of 1-3 sentences. The student's essay is whether or not they agree with the statement it produced.

Context: This is an introductory module to public history. One of the learning outcomes is to show a broad understanding of public history in different contexts. The initial plan to achieve this was to write generic essay questions like 'What is public history?' which is bit a boring!

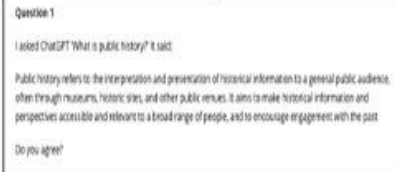
What I am aiming to achieve: The goal here was to give students a statement they could stick their teeth into and pull apart, thus advancing their critical thinking. As well as agreeing or disagreeing with the statement, they can think about how and why ChatGPT presents public history the way it does.

Where the inspiration comes from: As a public historian (and a public history module), it was important to me that the assessment engages students with the world around them.

Tools used: [ChatGPT](#)

References:

<https://webprod3.leeds.ac.uk/catalogue/dvnmdules.asp?Y=202223&M=HIST-2710>



Screenshot of one of the essay questions

AI to teach diverse/inclusive environments

Author: Lakshmy Mohandas
Contact details: lmohanda@purdue.edu
Role (educator/student): Instructional Developer Researcher
Institution/organisation: Purdue University

My idea: Using AI tools like Dall.E for Teaching/Learning about Inclusive Environments.

Context: Higher Education, Engineering

What I am aiming to achieve: The bias present in various online sources is reflected in the data gathered by AI tools, as they obtain information from multiple internet sources. For example, the Dall.E for image creation, a prompt "Robotics Engineer" yields predominantly pictures of male engineers (See image on right). Faculty could use these tools to teach about implicit/explicit bias and how to foster diverse and inclusive learning environments.

Where the inspiration comes from: Being an instructional developer, I have had instances where faculty from Civil/ Mechanical Engineering telling me that the students in their classroom are much more invested to learn from a male professor than a female. Such bias was also represented from AI.

Tool used: Dall.E

Link to more information: <https://oopenai.com/dall-e-2/>

References: Mollick, E. (2023, January 24). The practical guide to using AI to do stuff [Substack newsletter]. *One Useful Thing (And Also Some Other Things)*. https://oneusefultthing.substack.com/p/the-practical-guide-to-using-ai-to-2utm_campaign=post



Image created by Lakshmy Mohandas using Dall.E 2

Critical AI literacy and critical assessment

Author: Anna Mills
Twitter: @EnglishOER
Email: armills@marin.edu
Role: Writing instructor at College of Marin and OER textbook author

My idea: Students watch video and annotate orientations to ChatGPT, then read a NYT article and a sample ChatGPT critical assessment alongside a sample human-written assessment. They reflect on what ChatGPT misses and what they can learn about language models from the contrast..

Context: Complements the open text [How Arguments Work](#).

What I am aiming to achieve: Understanding of language model as statistical text predictors, not thinkers. Familiarity with common deficiencies in their outputs. Increased skill and confidence with critical assessment.

Link to more information: [View the activities on Canvas](#) or [Canvas Commons](#)

References: Gary Marcus's Scientific American article "[AI Platforms like ChatGPT Are Easy to Use but Also Potentially Dangerous](#)," Leon Furze's [Teaching AI Ethics](#) and others.



Photo by Mizuno K:
<https://www.pexels.com/photo/woman-sitting-on-couch-studying-with-laptop-12911684/>

Course descriptions and learning outcomes on courses about AI ethics

Another good way to help Universities adapt to generative AI is to devote courses to AI ethics, which will foster local expertise. Below is an example of the Learning Outcomes for a Computer Science course called Global AI Ethics (Dr. Isabel Pedersen, Ontario Tech University). As a reminder, a learning outcome is a measurable statement placed on a course syllabus (and other places) that “articulates what students should know, be able to do, or value as a result of taking a course or completing a program”¹⁹.

Global AI Ethics Graduate Program in Computer Science

1. Learn and employ a vocabulary needed for the interpretation of the socio-ethical issues surrounding AI to help with the positive design of future AI systems.
2. Identify the ways in which culture, politics, economics, international relations and human identity impinge on the field of AI ethics.
3. Compose assignments and projects reporting on AI ethics as a means to influence professional practices and future work for the betterment of society (i.e. ethically-aligned design).
4. Demonstrate knowledge of the use of AI tools, apps, models or technologies in assignments.

Below is an example of the learning outcomes for an undergraduate communication and digital media studies course called AI, Ethics, and Communication.

AI, Ethics and Communication 4th year, undergraduate communications

Learning outcomes

1. Demonstrate knowledge of the focus and findings of significant social science and humanities research fields in the discipline of communication and digital media studies relating to AI studies.
2. Demonstrate the ability to recognize the impact of AI technologies on professions that involve communication design, writing, visual communication, publishing, and knowledge and culture industries, necessitating an increased awareness of ethical design practices.
3. Demonstrate an increased understanding of the way Artificial Intelligence impacts humans undergoing technology adoption and adaptation, including an understanding of digital literacy and AI literacy with an emphasis on citizen engagement, policy, and governance.

Deployed: Fall 2021 and upcoming Fall 2023
©2023 Isabel Pedersen

AI, Ethics and Communication 4th year, undergraduate communications

Learning outcomes

4. Demonstrate the ability to utilize a variety of communication and digital media studies research methods to conduct research across a number of social contexts: economic, artistic, technological, political and cultural. Further, learn to integrate an awareness of significant methods and theories in the fields that involve human-computer interaction.
5. Defend ethical value-judgements about AI, communication, and digital media with regard to their power to support or undermine the pursuit of a democratic, fair, inclusive, equitable, human-rights driven, and just society.
6. Practice communication skills: written, visual, digital, critical and/or humanities web archiving, both with and without the use of generative AI tools.

©2023 Isabel Pedersen

Deployed: Fall 2021 and upcoming Fall 2023

This is an example of a course description for a graduate social science course on civic engagement and helping the public adapt to AI. It calls on students to participate in the process of adapting to AI.

Artificial Intelligence, civic engagement, and advocacy

Master of Arts in Social Practice and Innovation (MSPI)

This course will concentrate on solutions, participation, and community involvement. It will explore **human rights issues**, such as AI and algorithmic bias, facial recognition profiling, and AI colonialism. However, it will also **discuss solutions intended to mediate and/or improve the adoption of AI technologies**. Strategies include **AI literacy** campaigns, policymaking, AI ethical principles deployment, corporate involvement in standards-making, and campaigns led by international agencies such as UNESCO. Empowered with treating important social causes, **advocacy groups** work to shift the balance toward more value-based social outcomes. They initiate solutions including campaigns for the betterment of AI adoption, they work to educate the public, and they collaborate with actors to move toward progressive outcomes (e.g., Amnesty International's AI and human rights initiative).

©2023 Isabel Pedersen

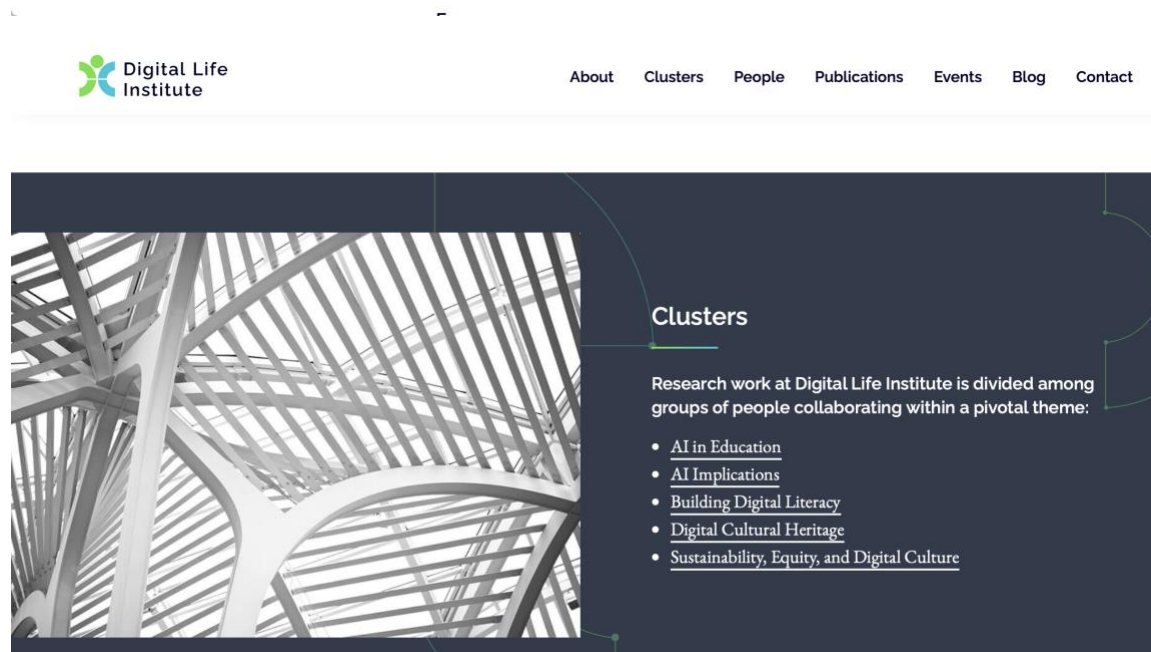
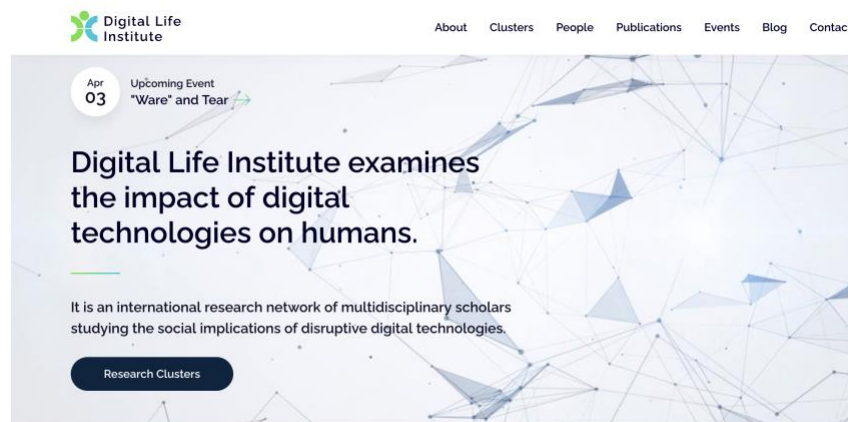
upcoming Winter 2024

Digital Life Institute

<https://www.digitallife.org>

Digital Life Institute is a community of researchers examining the human and social dimensions of digital technologies, advancing our understanding of their impact on humans. It is a hub for the critical analysis of digital technologies, an international network of interdisciplinary scholars interested in the social implications of disruptive technological advancement.

In the context of recent developments in artificial intelligence, such as ChatGPT, the Digital Life Institute has been exploring how artificial intelligence can be leveraged to support students and faculty, as well as how it might impact measures of assessing students.



Digital Life Institute Research Clusters <https://www.digitallife.org/research-clusters/>

There are three relevant research clusters to the emergence of AI writing:

AI in Education, led by [Dr. Lesley Wilton](#)

<https://www.digitallife.org/research-clusters/cluster/ai-in-education/>

Building Digital Literacy, led by [Dr. Ann Hill Duin](#)

<https://www.digitallife.org/research-clusters/cluster/building-digital-literacy/>

AI Implications, led by [Dr. Isabel Pedersen](#)

<https://www.digitallife.org/research-clusters/cluster/ai-implications/>

Relevant publications on AI writing, digital/AI literacy, and human-AI teaming

Katlyne Davis, Danielle Stambler, Chakrika Veeramoothoo, Nupoor Ranade, Daniel Hocutt, Jason Tham, John Misak, Ann Hill Duin & Isabel Pedersen. (2021). [Fostering student digital literacy through the Fabric of Digital Life](#). Journal of Interactive Technology and Pedagogy.

Ann Hill Duin, Isabel Pedersen, & Jason Tham. (2021). [Building digital literacy through exploration and curation of emerging technologies: A networked learning collaborative](#). In N.B. Dohn, S.B. Hansen, J.J. Hansen, M. deLaat, & T. Ryberg (Eds.), [Conceptualizing and innovating education and work with networked learning](#). Springer.

Ann Hill Duin & Isabel Pedersen. (2021). [Working alongside non-human agents](#). Proceedings of the 2021 IEEE International Professional Communication Conference.

Ann Hill Duin & Isabel Pedersen. (2021). [Writing futures: Collaborative, algorithmic, autonomous](#). Springer Publishing, series on Studies in Computational Intelligence. <https://www.springer.com/gp/book/9783030709273>

Ann Hill Duin, Jason Tham, & Isabel Pedersen. (2021). [The rhetoric, science, and technology of 21st century collaboration](#). In M. Klein (Ed.), [Effective teaching of technical communication: Theory, practice and application \(pp. 169-192\)](#). WAC Clearinghouse: Foundations and Innovations in Technical and Professional Communication series.

Andrew Iliadis, Tony Liao, Isabel Pedersen and Jing Han. (2021) [Learning about Metadata and Machines: Teaching Students Using a Novel Structured Database Activity](#). Journal of Communication Pedagogy. (4), 152-165. 2021.

Jason Tham & Ann Hill Duin (2021). Digital literacy in an age of pervasive surveillance. In E. Beck & L. Hutchinson (Eds.), [Privacy matters: Conversations about surveillance within and beyond the classroom](#). Utah State University Press.

Jason Tham, Kenyan Burnham, Daniel Hocutt, Nupoor Ranade, John Misak, Ann Hill Duin , Isabel Pedersen & Jessica Campbell. (2021). [Metaphors, mental models, and multiplicity: Understanding student perception of digital literacy](#). Computers and Composition.

Jason Tham. [Design Thinking in Technical Communication: Solving Problems through Making and Collaboration](#). Routledge, 2021.

Endnotes

- ¹ Russell, S., & Norvig, P. (1995). *Artificial intelligence: A modern approach*. Prentice Hall
- ² Simonite, T. (2019, February 11). Trump's plan to keep America first in AI. *Wired*. <https://www.wired.com/story/trumps-plan-keep-america-first-ai/>
- ³ Dignum, V. (2019) *Responsible artificial intelligence: How to develop and use AI in a responsible way*. Switzerland: Springer Nature. 17-18.
- ⁴ WIPO. (2019). *WIPO technology trends 2019: Artificial intelligence*. World Intellectual Property Organization. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf
- ⁵ WIPO. (2019). *WIPO technology trends 2019: Artificial intelligence*. World Intellectual Property Organization. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf
- ⁶ WIPO. (2019). *WIPO technology trends 2019: Artificial intelligence*. World Intellectual Property Organization. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf
- ⁷ Larsen, B., & Narayan, J. (2023, January 9). Generative AI: A game-changer society needs to be ready for. World Economic Forum. Retrieved April 5, 2023, from <https://www.weforum.org/agenda/2023/01/davos23-generative-ai-a-game-changer-industries-and-society-code-developers/>
- ⁸ <https://harvardindependent.com/2023/02/chatgpt-and-the-death-of-education/>
- ⁹ Katharina Buchholz, Statista <https://www.statista.com/chart/29174/time-to-one-million-users/>
- ¹⁰ Cade Metz. *Why Do A.I. Chatbots Tell Lies and Act Weird? Look in the Mirror*, New York Times, Feb 26, 2023 <https://www.nytimes.com/2023/02/26/technology/ai-chatbot-information-truth.html?partner=IFTTT>
- ¹¹ [Craig S. Smith](https://platform.openai.com/ai-text-classifier) IEEE Spectrum 13 Mar 2023 <https://spectrum.ieee.org/ai-hallucination>
- ¹² <https://platform.openai.com/ai-text-classifier>
- ¹³ Larsen, B., & Narayan, J. (2023, January 9). *Generative AI: A game-changer society needs to be ready for*. World Economic Forum. Retrieved April 5, 2023, from <https://www.weforum.org/agenda/2023/01/davos23-generative-ai-a-game-changer-industries-and-society-code-developers/>
- ¹⁴ <https://platform.openai.com/docs/chatgpt-education>
- ¹⁵ <https://www.viceprovostundergrad.utoronto.ca/strategic-priorities/digital-learning/special-initiative-artificial-intelligence/>
- ¹⁶ University of Toronto *ChatGPT and Generative AI in the Classroom* <https://www.viceprovostundergrad.utoronto.ca/strategic-priorities/digital-learning/special-initiative-artificial-intelligence/>
- ¹⁷ Who (or What) Wrote This? AI Content Generators in Higher Ed. Teaching and Curriculum Development Centre (TCDC) blog, Jan. 24, 2023 <https://iweb.langara.ca/tcdc/blog/2023/01/24/who-or-what-wrote-this-ai-content-generators-in-higher-ed>
- ¹⁸ <https://creativehecommunity.wordpress.com/2023/02/02/creating-a-collection-of-101-creative-ideas-to-use-ai-in-education/>
- ¹⁹ <https://teaching.cornell.edu/teaching-resources/designing-your-course/setting-learning-outcomes#:~:text=Learning%20outcomes%20are%20measurable%20statements,also%20called%20Backwards%20Course%20Design>

References

- Buchholz, K. (n.d.). ChatGPT Sprints to One Million Users. Statista. Retrieved from <https://www.statista.com/chart/29174/time-to-one-million-users/>
- Creative HE Community. (2023, February 2). Creating a Collection of 101 Creative Ideas to Use AI in Education. Retrieved from <https://creativehecommunity.wordpress.com/2023/02/02/creating-a-collection-of-101-creative-ideas-to-use-ai-in-education/>
- Dignum, V. (2019). Responsible artificial intelligence: How to develop and use AI in a responsible way. Switzerland: Springer Nature.
- Duin, A. H., & Pedersen, I. (2021). Writing Futures Framework. In: Writing Futures: Collaborative, Algorithmic, Autonomous. Studies in Computational Intelligence, vol 969. Springer, Cham. https://doi.org/10.1007/978-3-030-70928-0_1
- Duin, A. H., & Pedersen, I. (2023). Augmentation Technologies and Artificial Intelligence in Technical Communication: Designing Ethical Futures. Routledge.
- Larsen, B., & Narayan, J. (2023, January 9). Generative AI: A game-changer society needs to be ready for. World Economic Forum. Retrieved April 5, 2023, from <https://www.weforum.org/agenda/2023/01/davos23-generative-ai-a-game-changer-industries-and-society-code-developers/>
- Marlo, M. (2023, February). ChatGPT and the Death of Education. Harvard Independent. Retrieved from <https://harvardindependent.com/2023/02/chatgpt-and-the-death-of-education/>
- Metz, C. (2023, February). Why Do A.I. Chatbots Tell Lies and Act Weird? Look in the Mirror. New York Times. <https://www.nytimes.com/2023/02/26/technology/ai-chatbot-information-truth.html>
- Russell, S., & Norvig, P. (1995). Artificial intelligence: A modern approach. Prentice Hall.
- Simonite, T. (2019, February 11). Trump's plan to keep America first in AI. Wired. Retrieved from <https://www.wired.com/story/trumps-plan-keep-america-first-ai/>
- Smith, C. S. (2023, March 13). Hallucinations Could Blunt ChatGPT's Success: OpenAI says the problem's solvable, Yann LeCun says we'll see. IEEE Spectrum.
- Teaching and Curriculum Development Centre (TCDC) blog. (2023, January 24). Who (or What) Wrote This? AI Content Generators in Higher Ed. Retrieved from <https://iweb.langara.ca/tcdc/blog/2023/01/24/who-or-what-wrote-this-ai-content-generators-in-higher-ed>
- University of Toronto. (n.d.). ChatGPT and Generative AI in the Classroom. Retrieved from <https://www.vicereprovestundergrad.utoronto.ca/strategic-priorities/digital-learning/special-initiative-artificial-intelligence/>
- WIPO. (2019). WIPO technology trends 2019: Artificial intelligence. World Intellectual Property Organization. Retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf