

# Critical Thinking Bootcamp

Sharing skills, tools, and resources for librarians and faculty to combat misinformation in the face of constantly changing technology



 Sage

Sage's fourth annual Critical Thinking Bootcamp explored fostering critical thinking skills in the age of generative AI. This toolkit offers insights and resources from presenters and participants, and resources from Sage.

### This toolkit includes

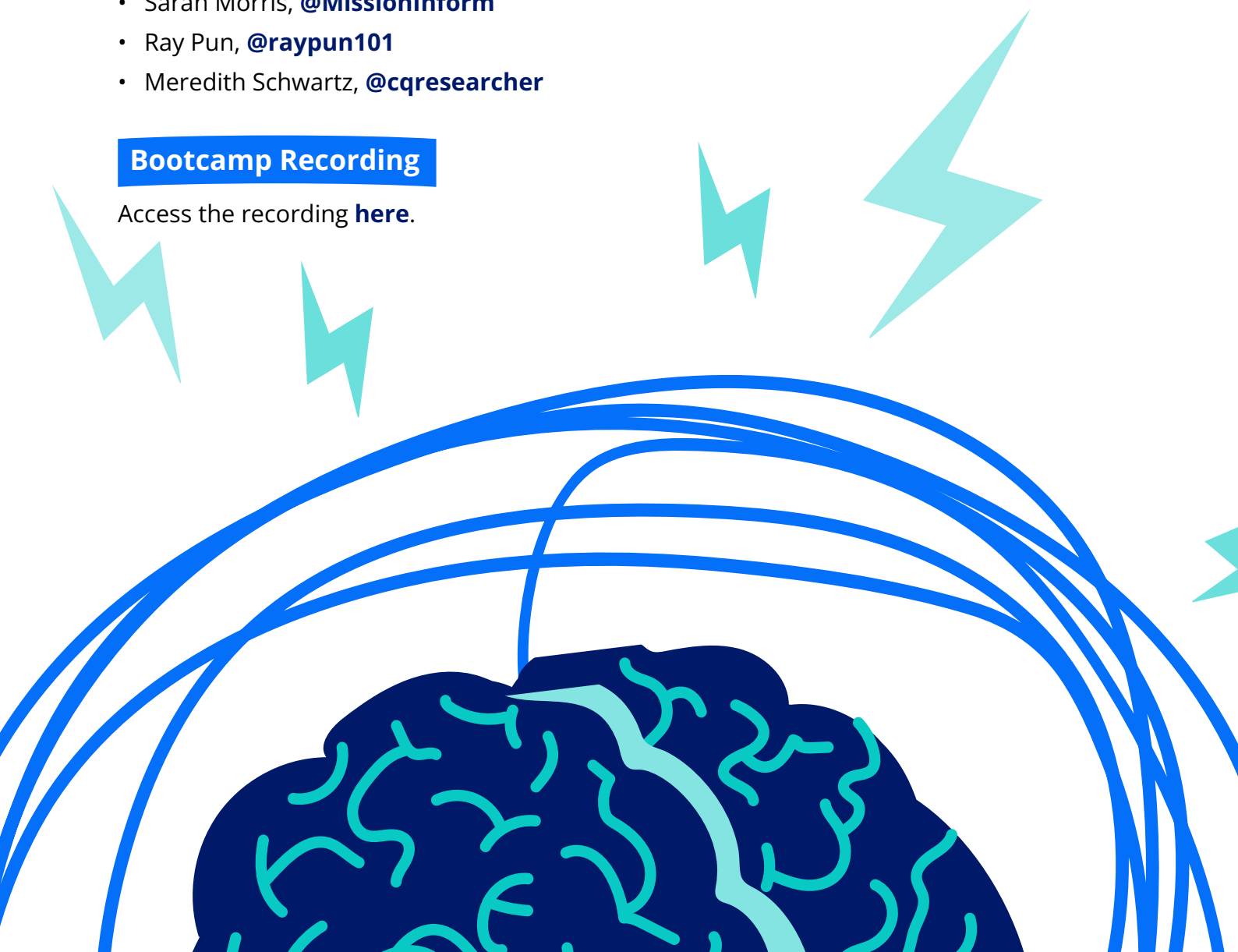
- **Bootcamp Recording**
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- **Additional Questions to Reflect Upon**

If you have feedback or questions, please reach out to: [pr@sagepub.co.uk](mailto:pr@sagepub.co.uk). Follow [#CriticalThinkingBootcamp](https://twitter.com/CriticalThinkingBootcamp), and our bootcamp speakers on Twitter for more:

- Dan Chibnall, [@BookOwl](https://twitter.com/BookOwl)
- Brooklyne Gipson, [@Brooklyne](https://twitter.com/Brooklyne)
- Leo Lo, [@leoslo](https://twitter.com/leoslo)
- Sarah Morris, [@MissionInform](https://twitter.com/MissionInform)
- Ray Pun, [@raypun101](https://twitter.com/raypun101)
- Meredith Schwartz, [@cqresearcher](https://twitter.com/cqresearcher)

### Bootcamp Recording

Access the recording [here](#).



## Insights from Bootcamp Speakers

We've pulled some key quotes from our panelists to better help you and your students foster critical thinking skills in the age of generative AI.

### Dr. Leo Lo

I think **we are at the beginning of a transformative moment in education** as we witness the rise of generative AI tools. With all this generative power at our fingertips, a question arises. What role does human critical thinking play now?

### Meredith Schwartz

**As great as ChatGPT is, it's not the whole world of AI.** It's not even the whole world of generative AI.

### Dr. Michael Spector

**Critical thinking is primarily a human activity** aimed at advancing understanding. It's a process of gathering, evaluating, and consolidating evidence in order to reach some conclusion.

### Dr. Madeleine Majia

When we're exploring the use of AI, I would like for us to also **think about the human-centric perspective or the humans in the loop—using human intelligence.** We must think about how we work with machines. And we must have a very clear and thorough understanding of the ethical uses of AI.

### From Dr. Raymond Pun

**If you're going to use these tools (to generate content), you should cite them in the APA citation style.** And if you're going to use these tools, make sure you paraphrase or quote them as you can but mostly power phrasing because it's so important that they understand what the text is saying, what the output is saying.

### From Dan Chibnall

We have to be able to **make sure that we can sharpen the tools in our toolbox when it comes to information literacy and critical thinking** and not just sort of let the chatbots do that work for us.

### Dr. Richard Wood

The most important tool students have is not an algorithm generated by a fact-checking app or AI training tool. Rather **their most important tool is their own critical thinking skills** coupled with a sense of being skeptical, yet not cynical.

### Dr. Brooklyne Gipson

These **large language modeling systems are just repeating to you what's out there.** To my students who are writing papers about race and gender, I say, do you really want a computer to feed to you what's already out there when we know that people don't think about these topics and they're not talking about them critically?

### Dr. Richard Rosen

When we start to take a look at AI, and particularly generative AI, we are dealing with artificial intelligence that creates algorithms. And they can create text, they can create imagery, or audio, or synthetic data. And that's where we need to start paying attention. Because, as we all know, **these tools aren't perfect.**

### Sarah Morris

**There're so many questions around how these things work, the possibilities and the limitations of AI,** and having that literacy to think critically, to ask questions. We need to delve into the power dynamics of how these things are developed, privacy issues, ethical issues, again, possibilities and limitations.

### Dr. Brady Beard

I would encourage faculty and librarians to not only **think about what our students are using AI for now but also about what are they going to be using them for in the future.**

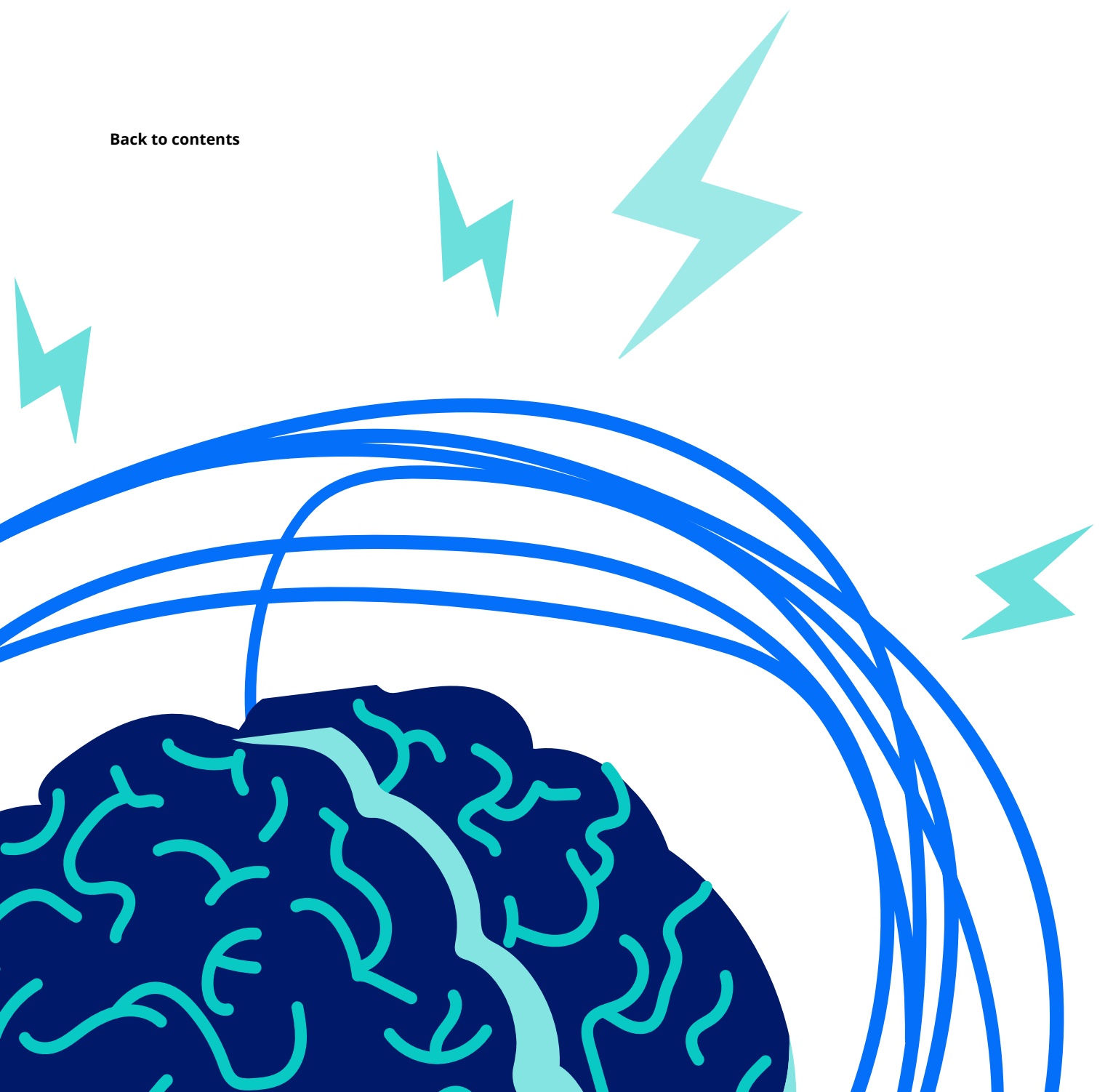
### Anne Lester

I think that we're moving toward a place where **students who are not aware of AI and the way that it can be used in research will actually be hugely disadvantaged.**

### Hannah Pearson

In treating students like content creators and embracing generative AI in the classroom, we can **tap into the critical thinking skills that students have already developed as content creators.**

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## Feedback from the Bootcamp's Chat

These various takeaways and additional thoughts were shared by participants and speakers in the chat.



It is tragic to ask a class of college students 'Who are critical thinkers?' and have no one raise their hand. No one has ever explained that they "think" every day and how to channel it.

ChatGPT can end the process of learning how to research and the learning of the critical thinking skills that research requires. In an all-too-common example, a student enters what they seek; the program spits out a prepared essay; the student hands that in for credit. This process relieves that student from having to create a question, find and read the sources, pull together the information, apply it to their question, and create an essay. Moreover, each of these steps has to be learned by the student. With ChatGPT they no longer have to 'waste' their time struggling through and learning the rigor these steps require. How do we protect that learning process?

We need to include AI as a process, including using it as a step in the course assignment as a secondary source to 'prime' students on the topic of a paper. Then have them prepare annotated bibliographies supporting the AI text and elaborating upon it."

Students must know how to accurately craft any search or prompt. Students could be required to do additional analysis, critique, or synthesis based on what they got first from the search.

Use AI as a partner in the process. For example, have the students respond to a writing prompt you provide. Have them compare it with what Bard might offer. Ask them to create their own prompt for Bard to respond to and then have them use their writing and the AI-generated information to create something new. Have them identify anything they find questionable from AI, research those areas, and note their sources.

As a librarian, I always use AI to search for sources and review the literature. I want to create a group of librarians to test and guide the search for the literature. With a focus on writing and creating content using generative AI, we ignore the impact of these tools on searching.

I think that the peer review process is one of the best tools humans have for testing what has been written. I do think that scholarly research is more consistently credible than most of the Internet content.

AI researchers often focus on tinkering with their algorithms rather than on making sure their datasets are suited to the task at hand. Librarians should investigate the data from which generative systems generate new content.

How do we even teach critical thinking in a 'post-truth' world where our students come from homes where the "truth" is what your dear leader says or when science is ridiculed?

The difficulties that I have experienced when teaching critical thinking is when I try to apply some analytic questions to create debate among students.

An older adult student of mine, returning to college after many years of working, admitted to me that he used ChatGPT and QuillBot to assist him with the research paper I assigned. He explained that returning to school in his 50s after so many decades away was an overwhelming experience. He said that AI-assisted him in his academic journey. I appreciated his candor and frankly, I agreed with this strategy.

In my experience of observing students' reactions to 'aha moments' as a result of critical thinking exercises, they seem to get a major dopamine-type hit from fighting their way to a novel realization. If we can get them to experience that victory often enough, I think the neurological reward system can start bending them toward engagement with the critical thinking effort.

One challenge is that students, particularly nontraditional ones, sometimes consider certain believed "truths" as fundamental to their identities (political, social, etc.) which makes critical thinking activities even more challenging.

A lot of good can come from AI if we learn and teach others to use it responsibly. It should not replace humans/educators.

# Resources from the Bootcamp's Chat

This list of resources was compiled from recommendations we received from the presenters and the participants of the Bootcamp. We've sorted them based on type.

## Websites/tools

**Zoom's Updated Terms of Service Permit Training AI on User Content Without Opt-Out**

[scite.ai/assistant](https://scite.ai/assistant)

[www.chatbotui.com/](https://www.chatbotui.com/)

**Searching for Evidence Using the ABCDE Framework**

**Welcome to Project Gutenberg**

**How to cite ChatGPT**

**Alder Graduate School of Education's Academic Honesty Policy**

**Paraphrasing Self-Test Tool**

**Games** for teaching about misinformation and disinformation

**Data Detox Kit**

**Google: How Search Algorithms Work**

**7 ways to avoid becoming a misinformation superspreader**

**A Guide To Anti-misinformation Actions Around The World - Poynter**

**A Field Guide to "Fake News" and Other Information Disorders**

**Google Fact Check Explorer**

**Center for Critical Race + Digital Studies**

The **Conscious Advertising Network**

**DEDA (Data Ethics Decision Aid):** a toolkit facilitating initial brainstorming sessions to map ethical issues in data projects

**Mozilla Community Participation Guidelines**

**News Literacy Project**

**Quiz: How well can you tell factual from opinion statements?**

**Sifting Through the Coronavirus Pandemic**

Spot the Troll Quiz: [spotthetroll.org/start](https://spotthetroll.org/start)

**Stanford Internet Observatory Cyber Policy Center**

**Teachable Machine:** Train a computer to recognize your own images, sounds, & poses

**The Media Manipulation Casebook**

## Articles and books

**The CLEAR path: A framework for enhancing information literacy through prompt engineering**

**The Art and Science of Prompt Engineering: A New Literacy in the Information Age**

**Human Meets AI: Helping Educators Navigate Their Emotions About Technological Change**

**Naturalizing Critical Thinking: Consequences for Education, Blueprint for Future Research in Cognitive Science**

**Web Literacy for Student Fact-Checkers**

**Misinformation on Misinformation: Conceptual and Methodological Challenges**

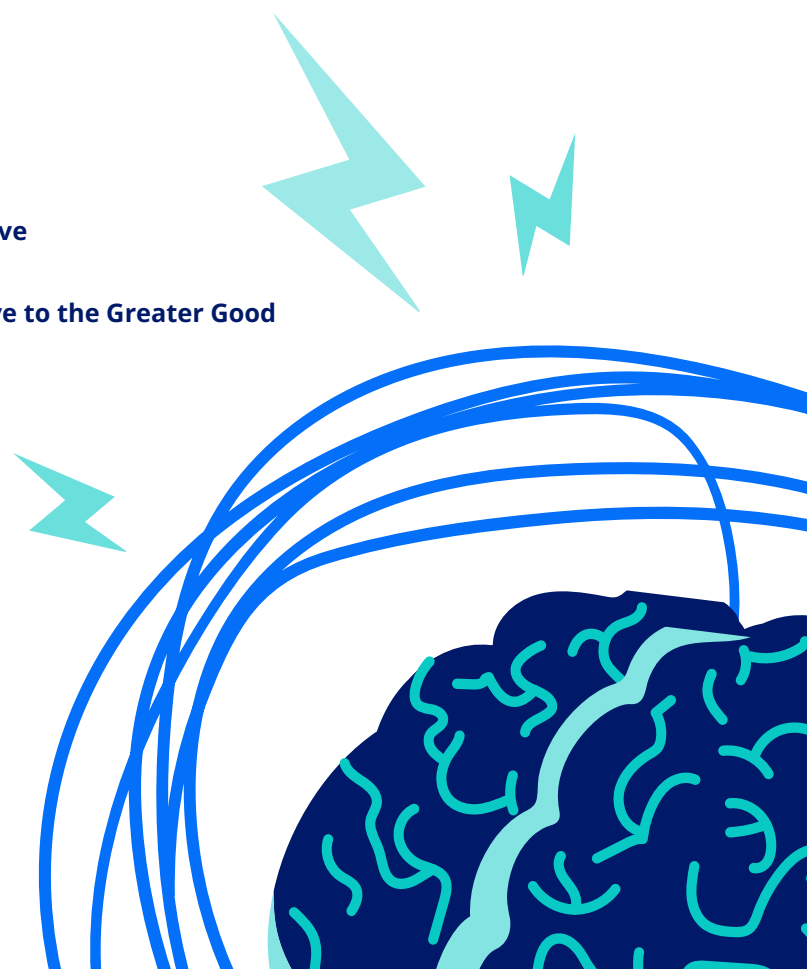
People Are Less Gullible Than You Think  
Completing Your Qualitative Dissertation  
How We Think  
Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Research Findings and Recommendations  
Leveraging Technology to Develop Students' Critical Thinking Skills  
Understanding by Design  
Model-Facilitated Learning  
What I do not know about learning  
Reflections on educational technology research and development  
Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models  
Ditch That Textbook  
ChatGPT and Good Intentions in Higher Ed  
Framework for Information Literacy for Higher Education  
ChatGPT trending in library instruction: We need an ethical framework  
Fake News and Alternative Facts: Information Literacy in a Post-truth Era  
Information Services to Diverse Populations  
Lexicon of Lies: Terms for Problematic Information  
Weapons of Math Destruction  
You Think You Want Media Literacy...Do You?  
3 Reasons For Information Exhaustion - And What To Do About It  
Your Happiness Was Hacked: Why Tech Is Winning the Battle to Control Your Brain—and How to Fight Back  
I Asked ChatGPT to Develop a College Class About Itself  
Prompt engineering for students - making generative AI work for you  
Embrace the Bot: Designing Writing Assignments in the Face of AI  
HubSpot's 2023 State of Consumer Trends Report  
2019 Lego and the Harris Poll  
Teaching Critical Thinking: Practical Wisdom

## Videos and podcasts

Paraphrasing Ideas in your Writing  
Stop assuming data, algorithms and AI are objective  
What Hath We Wrought?  
What Obligation to Do Social Media Platforms Have to the Greater Good

## Syllabi and courses

Critical Disinformation Studies: A Syllabus  
Disinformation & the Literacy Landscape  
Tech Ethics & Policy Class (Social Media Version)



## Recommended Resources from Sage

Drawing from our collection of books, journals, and digital tools, we've rounded up additional resources to assist you in the classroom.

### Recommended Reading

**What Do We Know and What Should We Do About AI?**

**'Critical Ignoring' May Be Just as Vital As Critical Thinking**

**Digital Society: An Interactionist Perspective**

**Managing Emerging Data Technologies**

**Honesty and Originality in Academic Writing**

**Check that Fact**

**Critical Thinking and Writing for Postgraduates, 4e**

**Critical Thinking for Strategic Intelligence**

**How to Read and Write Critically**

**How to Think: Your Essential Guide to Clear, Critical Thought**

**Read Critically**

**Think Critically**

**What Do We Know and What Should We Do About Fake News**

**Ready-to-Go Instructional Strategies That Build Collaboration, Communication, and Critical Thinking**

### Digital Resources

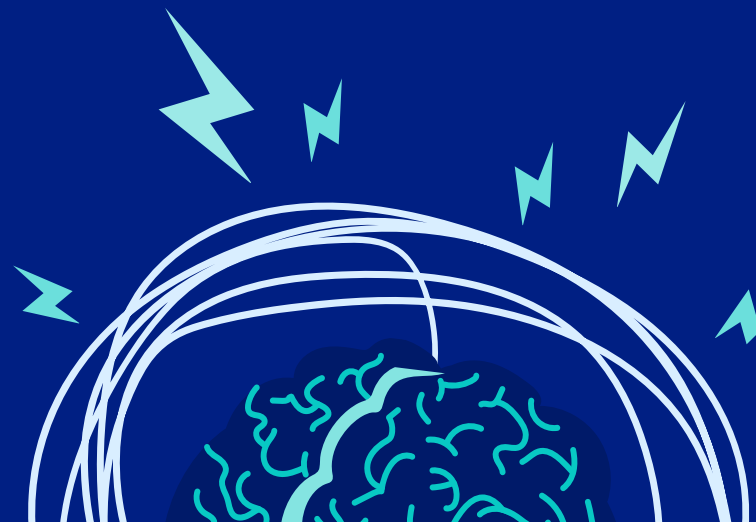
**Critical Thinking hub**—Here, you'll find all the latest resources from Sage on Critical Thinking, as well as any forthcoming events.

**Critical Thinking: An Online Course**—This Sage Campus course by expert Dr. Tom Chatfield equips students with the skills and habits of critical thinking.

**2022 Critical Thinking Bootcamp**—Download the recording and toolkit from our third Bootcamp to glean information and resources on the challenges and opportunities associated with AI, addressing ethical concerns in technology, and increasing algorithmic literacy.

**2021 Critical Thinking Bootcamp**—This recording and toolkit from our second Bootcamp included sessions on "Misinformation & Media: The Impact on Universities," "The Historical Use of Mis/Disinformation and What it Means for Educators," and "Informing Students About Algorithms and Information Ecosystems."

**2020 Critical Thinking Bootcamp**—This recording and toolkit from the very first Bootcamp contain additional wisdom and advice from expert panelists.





## Additional Questions to Reflect Upon

Though we couldn't get to all audience questions during the bootcamp, these questions provoke further thought, tips, and feedback. If you have any you'd like to share, tag us on Twitter with **#CriticalThinkingBootcamp**.

### On the future of critical thinking skills

How will we create policies to prevent the misuse of AI since its evolving and different countries may have different approaches?

How can we develop AI literacies in educators across domains?

Ethical discussions are needed immediately. Is it fair or appropriate to give a zero on a paper if a student typically averages a 'D' and all of a sudden provides an 'A' paper?

What are some concrete strategies for assigning outside-the-classroom essays that make use of AI?

### On prompt engineering as a tool for critical thinking

How could grading practices be transformed to harvest the power of AI?

Not everyone is excited or onboard with AI technologies. How do we convince the rest of the campus community to join the AI conversation?

What policy strategy will address the many jobs that will be at stake because of AI-generated content?

How is the debate over the use of AI as a source in a paper different from the debate over Wikipedia?

I recently found that asking generative AI to help create the best possible prompt is a good approach. What issues do you see with this approach, and if valid does that challenge your call for developing prompt engineering skills?

Is it easy to predict AI cheaters?

What is the role of synthesis as a critical thinking skill or subskill? Where does it fit into the process, and how do we support it in our students?

### On detecting mis- and disinformation

What is difference between critical reading, writing, and thinking?

How can we develop AI literacies in educators across domains?

How far back on the internet does AI pull from or what about fields that are more print book based? How affective is AI in these fields?

How do you use Chat GPT without creating account?

Has anyone established a peer-reviewed paper on ethical standards for consideration by instructors?

Can AI really create disinformation though? Can we really know about intentionality in AI if we can't be sure it 'understands' truth?

I'm curious about the use of the term "hallucinate" when AI generative tools fabricate information, resources, sources, etc. Why are we using a metaphor? Would it be better to just call it a fabrication or wrong?

### On what students want from AI

If AI hadn't been invented, would you want it to be invented and why?

### Presenters' Slides

[CTBC Presenters' Slides.pdf](#)

