



# Harnessing Pandora’s Box: At the Intersection of Information Literacy and AI

Lesson Plans and Activities for the Classroom

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# Executive Summary

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Artificial intelligence (AI) tools have been generating interest and media coverage recently, especially over the past few months with the widespread release of OpenAI's ChatGPT. These tools, while not being anything close to a true AI, are highly sophisticated writing generators. They have been trained on billions of documents scraped from the internet and can produce output on virtually any topic. News stories and opinion pieces by those working in higher education tend to fall into one of three camps: those who are worried about the technology and its potential misuse by students (plagiarism alarmists), those who are excited about the possibilities of utilizing AI, primarily to help streamline the research and writing process; and those who are resigned to the idea that this technology is here to stay and are interested in learning best practices to leverage its use to help their students learn.

Pandora's box has been opened, and there's likely no good way to keep students from using large language models (LLMs) like ChatGPT in their work. It is, therefore, important that higher education works to engage our students to promote a deeper learning and awareness of this technology and its limitations.

To address this need and these challenges, a set of learning activities closely tied to learning outcomes derived from the Association of College and Research Libraries (ACRL) [Framework for Information Literacy in Higher Education](#) (IL Framework) and ACRL's [Framework for Visual Literacy in Higher Education](#) are enclosed below. Each activity contains an overview of the information or visual literacy issue related to ChatGPT or AI tools.

Six templated lesson plans are included. Each was developed to be a stand-alone hour-long lesson plan. We designed each to be flexible, so that instructors can use them as appropriate for the different approaches taken in humanities, social sciences, and science courses. The plans contain the following sections:

- Introduction to the individual framework covered
- Learning objectives
- Discipline-focused activity with sample prompts for use with an LLM such as ChatGPT
- Teaching notes

Three of the plans cover information literacy, and the other three on visual literacy. The information literacy-focused lessons each focus on a single frame from the ACRL IL Framework:

- Research as Inquiry
- Scholarship as Conversation
- Searching as Strategic Exploration

The remaining three frames from the IL Framework — Information Has Value, Authority is Constructed and Contextual, and Information Creation as a Process — are not the focus of any single lesson plan. Instead, they are meant to be discussed as part of the lessons, using the guidance and recommendations included.

The ACRL Framework for Visual Literacy in Higher Education is a companion document to the IL Framework, and "is to be used in direct discourse with the Framework for Information Literacy." (Visual Literacy Framework, p. 2). The three lesson plans that address this framework incorporate ideas from both, although the primary focus is on visual literacy using different activities:

- Formal Analysis / Spot the AI
- AI Image Generators and Copyright
- AI Image Generators and Bias in the Dataset

## Lesson 1 – Research as Inquiry

### *Introduction*

The *Research as Inquiry* frame looks to help show that research is a process where you can develop a research question and begin to ask more complex questions as the question is reframed after finding gaps in the current information or research (Association of College and Research Libraries, 2016, p. 18).

Researchers have first to develop a foundational understanding of the topic before they can then identify those gaps, arriving at a basic, fundamental, researchable question they can then use going forward.

Other frames from the ACRL can also be folded into the lesson for this topic. One example would be with the Authority is Constructed, discussing how LLMs and other AIs and how they reinforce bias along with how sources are evaluated. Looking at how to create and modify prompts for these systems also gives a lead-in to conversations around *Information Creation as a Process* and *Scholarship as a Conversation*.

This lesson plan gives guidance on working with students to develop better skills in the formulation of questions for research as well as the process of asking questions in a way that better promotes understanding of the issues as well as further areas of study and research.

Looking at what ChatGPT generates, starting with a simple prompt and then using the results to refine the questions and prompts, allows students to gain a better understanding of how research is an iterative process that requires evaluation of not only the original question but how that changes as you refine your sources along with the discoveries you make during this research process.

### *Teaching Notes*

- While example prompts are provided for subjects of programming, math education, and astronomy, you can use or adapt prompts as needed for any subject. Just remember to keep the initial prompt simple so that students can revise and reflect on how they could be made better.
- ChatGPT and other LLM tools are always in the process of being modified and improved. Expect that any prompt you give to an LLM could generate a different response each time the question is asked.
- This lesson plan is optimized for students in introductory courses but could be adjusted for any course level.
- Access to the free version of ChatGPT and other LLMs could be limited so having a set of pre-made prompts and responses could help limit downtime.

### *Learning Objectives*

- Students will formulate research questions related to coding by engaging in iterative dialogue with ChatGPT, allowing them to approach projects from a research perspective.
- Students will communicate their coding solutions clearly and effectively by engaging with ChatGPT to review and revise their code and by using ChatGPT to identify potential areas for improvement and evaluate the generated code for completeness.
- Students will understand the ethical considerations of using ChatGPT for research around issues such as data privacy, security, and intellectual property rights.
- Students will understand the importance of ongoing learning in coding to discuss best practices and how they may be affected by ChatGPT.

## Lesson Plan

### **Materials Needed**

Either have each group use ChatGPT to generate an answer of their choosing in the subject being discussed or provide example code and the prompts used to generate those responses.

Three example ChatGPT prompts and responses are provided below to be used to help with prompt creation and provide pre-made examples for use.

### **Introduction (15 minutes)**

*Intro to the frame*

- Main idea - Research depends on complex questions that we may have to ask in different ways, so how can ChatGPT and other Large Language Model (LLM) AIs help us to better focus on the concept or problem we are trying to research or solve?

*What are the steps in this process?*

- What is the area we are trying to investigate, and what is the scope of the question?
- How can we break that question into more manageable parts that may be easier to understand and help refine our question?
- How can we use a tool like ChatGPT to help us with this process to make an excellent researchable question or usable code?

*Considerations for using the Tool*

- Discuss an ethical framework for using this tool: When would it be helpful or not helpful to use this tool? Who benefits from using it, and who is harmed by it?
- Where does the tool get its sources from, and what is the best way to evaluate them?

### **Working with the generated response (30 minutes)**

Using either a custom prompt or one of the example prompts provided below:

- Learners work in groups/pairs/individuals to read the generated responses and evaluate them for completeness and usability.
- Learners will use their evaluation to prepare a brief overview of what was found and what needed to do to correct or improve the prompt.

### **Questions to ask learners after generating responses to discuss together (15 mins discussion)**

- What was the initial prompt you gave to the system?
- Did ChatGPT generate the answer correctly? For example for a programming question, did it run without any errors? Was generated answer correct for the topic asked?
- What were the errors?
- How could you revise the prompt for a better answer with fewer errors?
- Could you tell where the system got its information from? Were any sources cited? What are the implications of this?

### **Example Prompt 1**

"Can you provide code for creating a bar chart in Python?"

*ChatGPT:*

*"Certainly! You can create a bar chart in Python using various libraries, such as Matplotlib or Seaborn. Here's an example using Matplotlib:*

```
import matplotlib.pyplot as plt

# Sample data
x = ['Category 1', 'Category 2', 'Category 3', 'Category 4']
y = [10, 25, 15, 20]

# Create a bar chart
plt.bar(x, y)

# Customize the chart
plt.title('Bar Chart')
plt.xlabel('Categories')
plt.ylabel('Values')

# Display the chart
plt.show()
```

In this example, we define two lists:  $x$  for the categories and  $y$  for the corresponding values. Then, we use `plt.bar()` function to create a bar chart by passing the  $x$  and  $y$  values as arguments.

After that, we customize the chart by adding a title,  $x$ -label, and  $y$ -label using `plt.title()`, `plt.xlabel()`, and `plt.ylabel()` functions, respectively.

Finally, we use `plt.show()` to display the chart on the screen.

You can modify the data and customize the chart further based on your requirements. Additionally, you may need to install the Matplotlib library if it's not already installed. You can use `pip install matplotlib` to install it."

## Example Prompt 2

"I want you to act as a math teacher. I will provide some mathematical equations or concepts, and it will be your job to explain them in easy-to-understand terms. This could include providing step-by-step instructions for solving a problem, demonstrating various techniques with visuals or suggesting online resources for further study. My first request is "I need help understanding how probability works."

ChatGPT:

"Sure, I would be happy to help! Probability is a fundamental concept in statistics that expresses the likelihood that a specific event will occur.

Understanding Probability:

1. *Imagine you have a fair six-sided die. If you were to roll this die, the probability of any one side coming up (say you were interested in rolling a 3) is 1 out of 6, often expressed as a fraction (1/6) or about 0.1667 in decimal form or 16.67% as a percentage. This is because there is one desired outcome (rolling a 3) and six possible outcomes (the six faces of the die).*
2. *Basic Principles:*
  - *Probability always falls between 0 and 1 (or 0% and 100%). A probability of 0 means the event will never happen and a probability of 1 means the event is certain.*
  - *The sum of the probabilities of all possible outcomes is always 1. In the die example, the probabilities of rolling a 1, 2, 3, 4, 5, or 6 are each 1/6, and if you add these up, you get 1.*
3. *Types of Probability:*
  - *Experimental Probability is based on the results of actual experiments. For example, if you flip a coin 100 times and it lands on heads 55 times, the experimental probability of flipping heads is 55/100 or 0.55.*
  - *Theoretical Probability is what you expect to happen, assuming that all outcomes are equally likely. The theoretical probability of flipping a coin and it landing heads is always 1/2, or 0.5, because there are 2 possible outcomes and both are equally likely.*
4. *Compound Probability:*
  - *If you want to find the probability of two independent events happening together, you multiply their probabilities. For example, if you want to know the probability of flipping a coin and getting heads ( $P=0.5$ ) AND rolling a die and getting a 3 ( $P=1/6$ ), you would multiply ( $0.5 * 1/6$ ) to get about 0.0833, or 8.33%.*
  - *If you want to find the probability of at least one of two events happening, you add their probabilities. For example, the probability of rolling a die and getting a 3 ( $P=1/6$ ) OR a 4 ( $P=1/6$ ) is ( $1/6 + 1/6 = 1/3$ ) or about 33.33%.*

*I hope this gives you a basic understanding of how probability works! Please let me know if you want more detailed explanations or if you have other topics or problems in mind."*

### **Example Prompt 3**

"What would happen if two supermassive black holes merged?"

ChatGPT:

*"When two supermassive black holes merge, it results in a cosmic event known as a binary black hole merger or coalescence. The process of black hole mergers is a fascinating and complex phenomenon that involves the interaction of gravity and the distortion of spacetime. Here's an overview of what would happen during such a merger:*

1. *Inspiral Phase: Before the actual merger occurs, the two supermassive black holes start orbiting around each other. This phase is called the inspiral phase, during which the black holes gradually lose energy due to the emission of gravitational waves. These waves carry away energy and angular*

momentum from the system, causing the black holes to spiral closer together over an extended period of time, which could be millions or billions of years.

2. *Merger Phase: As the black holes approach each other, their gravitational attraction intensifies. Eventually, they reach a point where their event horizons, the boundaries beyond which nothing can escape the black hole's gravitational pull, overlap and merge together. The merging process releases an immense amount of gravitational wave energy in a very short span of time.*
3. *Gravitational Wave Emission: The merger of two supermassive black holes creates intense ripples in the fabric of spacetime, known as gravitational waves. These waves propagate outward in all directions, carrying away a significant portion of the combined mass-energy of the black holes. The emitted gravitational waves are so powerful that they can be detected by gravitational wave observatories, such as LIGO and Virgo.*
4. *Recoil and Ringdown: During the merger, the combined black hole undergoes a phase called the "ringdown." The resulting black hole settles into a more stable state by emitting additional gravitational waves. In some cases, the merger can also impart a gravitational recoil or kick to the newly formed black hole, causing it to move through space at high speeds. This recoil is a result of the asymmetric emission of gravitational waves during the merger process.*

*The consequences of a supermassive black hole merger have profound implications for the surrounding environment. The gravitational waves generated during the merger carry away a tremendous amount of energy, which can impact the distribution and motion of matter in the vicinity of the merging black holes. The release of energy from the merger may also lead to the formation of jets and outflows of high-energy particles, which can have far-reaching effects on the surrounding galaxy, including the regulation of star formation and the distribution of gas. Understanding the dynamics and aftermath of supermassive black hole mergers is an active area of research in astrophysics. These cosmic events provide valuable insights into the nature of gravity, the evolution of galaxies, and the role of black holes in shaping the universe."*

## Lesson 2 – Scholarship as Conversation

### *Introduction*

The "Scholarship as Conversation" frame focuses on understanding the discourse by which we come together in the research community to negotiate meaning (Association of College and Research Libraries, 2016, p. 20). Researchers are expected to seek out, critically evaluate, and correctly attribute previous perspectives on a topic while also contributing their unique perspective at a level appropriate for the mode of communication and audience. Researchers are expected to have "a fluency in the language and process of a discipline," and that lacking that understanding "disempowers their ability to participate and engage" in a scholarly conversation.

The "Information Has Value" and "Authority is Constructed" frames are closely related to this topic and can also become part of class discussion. Information systems privilege authoritative voices, and that authority is constructed ("various communities may recognize different types of authority"). Some communities and scholars are underrepresented or entirely marginalized in academic discourse. This is carried over into the databases used to build LLMs, reinforcing existing bias and inequities (Alba, 2022).

The goal of this lesson plan is to work with students to increase understanding of the scholarly conversation in their discipline of study, the rhetorical conventions, citation practices, etc. by comparing a standard disciplinary article with an essay generated on the same topic by ChatGPT. Students will have the opportunity to reflect on the conventions of their discipline and also the larger issues of bias, privilege, whose voices are included in academic conversations and whether these same phenomena appear in text generated by ChatGPT.

### *Teaching Notes*

- Adapt prompts to your specific discipline/learning goals.
- ChatGPT and other tools are being trained every time somebody gives it feedback on generated text. Expect that over time it will be better able to replicate disciplinary scholarly conventions.
- Designed for students in introduction to the major courses (or the first class required of all majors).

### *Learning Objectives*

- Students will critically evaluate content generated by ChatGPT in order to discuss the accuracy of the information and disciplinary conventions of its presentation.
- Students will examine modes of discourse in their discipline in order to evaluate evidence cited by ChatGPT.
- Students will understand how LLMs generate text in order to critically examine how individuals or groups of individuals may be underrepresented or systematically marginalized within the system.

### *Lesson Plan*

#### *Part I*

- Break students into small groups
- Introduce the concept that scholarship is a conversation among researchers that is ongoing and can be contributed to. Each discipline approaches this conversation differently based on: who the author is addressing (audience), the subject of the conversation, and the intent of the conversation.
- Provide groups an article from disciplinary journal, a class reading, or a seminal article in the field.
- Ask groups to analyze the article for disciplinary conventions.
  - Direct students to look for conventions of your discipline. [Citation style, in-text citations, general structure of the article, rhetoric, etc.]
- Come back together to brainstorm what academic writing looks like in the selected discipline.
- Discussion question:



- How do X [humanists, social scientists, scientists] communicate their research?
- Where does bias appear in this system, and how might it get reinforced?

## **Part II**

- ChatGPT prompt: Write an academic analysis of [topic of article used in Part I] citing 5 sources. Print the generated text for students (avoid requiring students to sign up for ChatGPT, and to ensure that it is optional).
- Break students into small groups.
- If doing this in a new class session, remind the class of the academic conventions discussed in Part I.
- Ask students to analyze text generated by ChatGPT.
- Discussion questions:
  - What scholarly conventions can ChatGPT follow? Which are missing?
  - Follow a citation. [This might require instruction in library resources, how to tell a book citation from a journal from a book chapter].
  - Is the information cited presented correctly for the content it contains and for the disciplinary conventions?
  - Where does bias appear in this system, and how might it get reinforced?

## Lesson 3 — Searching as Strategic Exploration

### *Introduction*

The frame "Searching as Strategic Exploration" focuses on ensuring learners understand that searching is a complex task that requires persistence and flexibility. Learners are expected to be able to use a variety of tools, resources, and skills to help them find information relevant to their needs, as well as understand the highly contextualized nature of information sources (Association of College and Research Libraries, 2016, p. 22) .

This lesson plan leads learners through the keyword brainstorming and database searching processes, using ChatGPT as a tool for topic exploration. Instructors will discuss the differences between GPTs and research databases, the information they do and do not contain, and how they can be used (and misused!) to assist in the research process. Learners will use ChatGPT to generate a keyword list for a topic, and compare this list to a human-generated keyword list. They will then have the opportunity to search a research database using both lists and discuss how the search results differ.

Due to the opacity in the way that ChatGPT and other large language models are trained, the frames "Authority is Constructed and Contextual", "Information Creation as a Process", and "Scholarship as Conversation" are highly connected to this topic and can easily be addressed as part of this lesson plan. A question that is likely to come up is why learners shouldn't simply ask ChatGPT to provide a list of relevant information sources (instead of searching in a research database), which will give instructors an opportunity to discuss ChatGPT's "hallucinations" as well as the currency of its training dataset. If desired, instructors can also use this as an entry point to talk about algorithmic biases and the white, Western-centric nature of its dataset.

### *Teaching Notes*

- This lesson can be used in either introductory classes with a basic topic to help students better understand how these research tools work, or in an advanced class with a more detailed topic to help students gain a deeper insight into keyword generation.
- Instructors should test a sample prompt in ChatGPT (or other chosen AI tool) prior to the session to ensure the tool behaves as expected and to scout potential issues and discussion points ahead of time.
- Instructors should not require students to sign up for an account with any specific tool due to student data privacy concerns. Instead, they should plan to either use their own account if desired, or create a dummy account with shared credentials.

### *Learning Objectives*

Students will be able to:

- understand how library databases categorize article information in order to generate a basic list of search terms relevant to a topic of their choice
- understand the basics of how GPTs are trained and generate responses in order to identify gaps in the search term suggestions they return
- compare search results from AI-generated keywords and human-generated keywords in order to critically evaluate the information and gaps returned from each

### *Lesson Plan*

- Overview (2-3 mins)
  - Lesson should ultimately help you quickly and efficiently find relevant sources for your research assignments
  - GPTs and research databases — uses and misuses for getting started with research
- What are GPTs? (5-7 mins)

- What information do they contain?
- What information do they NOT contain?
- How is the information categorized?
- Compare and contrast to search engines
- Best way to retrieve information: targeted prompts
- What are research databases? (5-7 mins)
  - What information do they contain?
  - What information do they NOT contain?
  - How is the information categorized?
  - Compare and contrast to research databases
  - Compare and contrast to search engines
  - Best way to retrieve information: keywords
- Keyword generation (20-30 mins)
  - Basic process
    - Identify topic
    - Map out themes and synonyms
    - Use search engine to identify additional terms as needed
    - Connect with Booleans
  - Basic process using GPT
    - Identify topic
    - Create targeted prompt
    - Analyze response
    - Refine prompt if needed, repeat analysis
  - Activity
    - Divide into groups
      - half the class creates human-generated keyword list
      - half creates prompt for ChatGPT to generate keyword list
    - Discussion: compare the process and results from each group
      - What terms are the same across groups?
      - What terms are missing from either?
      - What challenges did you have and how did you overcome them?
  - Discussion: Why can't we just ask ChatGPT to generate a list of references?
    - Frequent hallucinations
    - Doesn't contain current information
    - Algorithmic biases
- Database searching (7-10 mins)
  - Pick a database relevant to the topic
  - Activity
    - Compare actual results from each generated list
    - How relevant are the search results?
    - How could the search be improved?
- Wrap-up discussion and questions (time remaining)

### *Subject-specific sample topics*

ChatGPT can be most easily queried using some variation of this basic prompt:

*" Please create a list of keywords that I might use to find research articles on the topic [insert topic]."*

Users can create more detailed and specific prompts if they like, but this simplistic prompt is more likely to be similar to what undergraduates might use.

Some possible topics, depending on the class:

- graphite mineralogy (chemistry; geology)
- ion transport in frogs infected with chytridiomycosis (biology; physiology)
- mental health programs in k-12 schools and their impact on student wellbeing (nursing; public health; education)
- political commentary in the novel *One Hundred Years of Solitude* (literature; Latin American studies)
- political commentary in the play *El Gesticulador* by Rodolfo Usigli (theatre; Latin American studies)

# Visual Literacy Lesson Plans

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## Introduction

The [ACRL Framework for Visual Literacy in Higher Education](#) is a companion document to the ACRL Framework for Information Literacy. Published in 2022 by the ACRL Visual Literacy Standards Task Force, the document supersedes the previous ACRL Visual Literacy Competency Standards for Higher Education (2011). The Framework for Visual Literacy identifies four “emerging themes” in visual literacy: “Learners participating in a changing visual information landscape,” “Learners perceive visuals as communicating information,” “Learners practice visual discernment and criticality,” and “Learners pursue social justice through visual practice.” The last theme was added in response to criticisms about the lack of a social justice frame in the ACRL Framework for Information Literacy.

The four themes are subdivided into knowledge practices and dispositions that are then crosswalked to the frames in the ACRL Framework for Information Literacy. Knowledge practices and dispositions can be crosswalked to more than one frame. For example, the knowledge practice, “Examine visuals for signs of alteration, such as cropping or use of digital filters, and consider the intent and consequences of any changes made”, is crosswalked to “Authority is Constructed and Contextual” and “Information Creation as a Process.” Knowledge practices and dispositions are also linked to social justice. For example the disposition, “Prioritize ethical considerations for cultural and intellectual property when creating, sharing, or using visuals,” is linked to “Information Creation as a Process,” “Information has Value,” and “Social Justice.” Knowledge practices and dispositions that fall under the theme “Learners pursue social justice through visual practice” are all found somewhere in the previous three themes to demonstrate that social justice is inherent to all parts of visual literacy. For example, the aforementioned disposition, “Prioritize ethical considerations for cultural and intellectual property when creating, sharing, or using visuals,” can be found under both the “Learners participate in a changing visual information landscape” theme and the “Learners pursue social justice through visual practice” theme.

This document contains three lesson plans designed to engage students with the ACRL Framework for Visual Literacy through AI image generators like Dall-e. The first lesson is based on the formal analysis of images, formal elements, and the principles of design, the second asks students to consider copyright in relation to AI image generators, and the third helps students understand how bias in the AI image generators’ datasets influence the content they generate. Lessons plans are designed to fit into a one hour and twenty minute class period.

All learning objectives are taken from the knowledge practices and dispositions identified in the ACRL Framework for Visual Literacy. Each knowledge practice and disposition is also crosswalked to its related frames from the ACRL Framework for Information Literacy.

## Lesson Plan 1: Formal Analysis/Spot the AI

### ACRL Framework for Visual Literacy Theme(s) Addressed

- Learners perceive visuals as communicating information
- Learners practice visual discernment and criticality

### Learning Objectives

Students will compare and contrast two images, one created entirely by an artist and the other created, in part, via [Dall-e's Outpainting](#) feature in order to:

- Explore choices made in the production of visual communications to construct meaning or influence interpretation, especially with regard to representations of gender, ethnicity, race, and other cultural or social identifiers. [Authority is Constructed and Contextual] [Information Creation as a Process] [Social Justice]
- Examine visuals slowly and deeply in order to develop and refine critical observation skills. [Research as Inquiry]
- Examine visuals for signs of alteration, such as cropping or use of digital filters, and consider the intent and consequences of any changes made. [Authority is Constructed and Contextual] [Information Creation as a Process]

### Teaching Notes

- Before the lesson, the instructor chooses a painting, or other 2-dimensional artwork, by an artist. The artwork shouldn't be familiar through popular culture, for example, artworks like Monet's *Water Lilies* are too recognizable to be used in the lesson.
- Artworks can be chosen from any style, time period, artist, ect. the instructor chooses. The instructor should investigate possibilities in Dall-e Outpainting prior to class to achieve their desired results and/or based on course content. For example, a Renaissance art history class might choose to use the *Merode Altarpiece* and focus on how AI handles iconography. An art appreciation class, or a class where students are learning formal analysis, might choose to use an artwork that has an abstract or abstracted/stylized vocabulary to focus on formal elements.
- This lesson has the benefit of being a compare/contrast assignment. Comparing and contrasting artworks is one of the primary ways meaning is examined in art history and is often an area of focus on exams and essays.
- This assignment assumes that students already have an understanding of the formal elements and principles of design.
- More information on how to use Dall-e Outpainting can be found in the link in the learning objectives.
  - At this time, Dall-e still has a free account option that allows for 50 starting credits and 15 credits each month after the 50 are used. This may change.

### Activity (65 minutes)

- Introduce students to lesson (10 mins)
  - Instructor projects predetermined artworks for students. One is a painting, or other two dimensional artwork, created entirely by an artist. The other is the same image but instead of being created entirely by the artist, it has been finished by Dall-e Outpainting
  - Ask: Which image do you believe was created entirely by an artist? Which image do you believe was created entirely by Dall-e Outpainting? Use your knowledge of the formal elements and principles of design to form your argument.
    - Briefly explain that you can upload an image into Dall-e Outpainting and it will complete it
    - Briefly explain how AI image generators work

- Like large language models like ChatGPT, Dall-e is trained on a large dataset (in this case images) so that it can predict what color pixel should come next in a sequence based on the words you enter as a prompt
  - It doesn't "know" what it's creating, it is just predicting the next color pixel based on the dataset it's been trained on
- Give students time to consider the questions and write down their initial thoughts and responses
- At the end, ask students which image they think is created entirely by the artist and which is created with the help of AI
- Student create their arguments (25 min)
  - Put students into two groups based on their thoughts
  - Tell students they will present their arguments to the class
  - Give groups 20 minutes to formulate their arguments
- Student debates (20 mins)
  - Each side is given 10 minutes to present their arguments
- Wrap-Up discussion (10 mins)
  - Ask the following questions:
    - Has anyone changed their mind throughout the discussion?
    - Instructor reveals which artwork was created entirely by an artist and which was created with the help of AI
    - Did you see any mistakes or glitches in the AI images that tipped you off or ones that you see in retrospect? Which artwork do you think is more "successful" and why? Why? Which artwork do you prefer? Why?
      - Note: Dall-e struggles with hands, for example
      - Note: Assure students that it can be challenging to spot the AI and that, not only is it important they realize that, AI often makes what appear to be logical decisions.

### *Assessment recommendations*

Success for this lesson should not be based on whether students guess the correct answer on which artwork is "real" and which is AI. Rather, success should be based on students' reasoning behind how the formal elements and principles of design work in each image as demonstrated through the in-class debate. AI image generators are trained on a large dataset that translates words to pixels. Although your experience might be different, I have found that the choices of form and design made by Dall-e's Outpainting, while not perfect, often make some sense.

## Lesson Plan 2: AI Image Generators and Copyright

### *ACRL Framework for Visual Literacy Theme(s) Addressed*

- Learners participate in a changing visual information landscape
- Learners perceive visuals as communicating information
- Learners practice visual discernment and criticality

### *Learning Objectives*

- Students will research and discuss various AI image generators' copyright policies in order to:
  - Prioritize ethical considerations for cultural and intellectual property when creating, sharing, or using visuals. [Information Creation as a Process] [Information has Value] [Social Justice]
  - Consider if creation and/or use of a visual will constitute misappropriation, which dissociates visuals from their original contexts and deprives individual generators and cultural communities of agency and credit [Information Creation as a Process] [Information Has Value] [Social Justice]
  - Realize that visuals in all formats are works of intellectual property. [Information has Value]

### *Teaching Notes*

- The number of students in each group can vary from 3-4 depending on the size of the class
- AI image generators that can be used: [Dall-e](#), [Midjourney](#), [DeamStudio](#), [Fotor](#), etc.
  - If needed, additional AI image generators can be found through a Google search

### *Activity (70 minutes)*

- Introduce activity (5 mins)
  - Tell students class will focus on AI image generators and copyright
  - In groups of 3-4, students will research how various AI image generators handle copyright using the AI image generator's website, Google, and library databases.
    - Students should answer the following questions:
      - Who owns the copyright to an image generated by the AI image generator?
      - Did you find any sources that indicate there are complications to how the AI image generator handles copyright permissions?
- Students research an AI image generator (20 mins)
- Students present their findings to the class (25 mins)
  - Each group is given 5 minutes to present
- Discussion (10 mins)
  - Ask the following:
    - How do the various AI image generators compare and contrast in how they handle copyright?
      - Which AI image generator has the "best" copyright for users? Why?
      - Which AI image generator has the "worst" copyright for users? Why?
    - What does it mean if you didn't find any information on copyright and your AI? and Why might this be problematic?
    - Would you hesitate to use any of these tools based on how they handle copyright?
    - Where did you find the best information about AI image generators and copyright? Why do you think that is?
- Discussion of addition copyright concerns (10 mins)
  - Tell students that AI image generator copyright is currently being decided by the courts
    - Issue: Only human beings can own a copyright



- [Example](#): Kris Kashtanova used Midjourney to illustrate her graphic novel *Zarya of the Dawn*. The US Copyright Office ruled that while she owns the copyright of the written text and sequence of images in the novel, she does not own the copyright to the individual images made by Midjourney.
- Tell students that AI image generators are trained on image sets scraped from the internet, which means that artists' images were used in this dataset without the artists' consent
  - [Example](#): Getty Images is suing Stability AI for using Getty Images in the AI's dataset without permission.
  - [Example](#): Artists are also suing Midjourney for using their work without their consent.
- Discussion Wrap-Up
  - Knowing this, would you hesitate to use any of these tools based on how they handle copyright?
  - Would you care if images you created had been used in the dataset? Why or why not?
  - Should people be able to own the copyright to an image generated by AI?

### *Assessment recommendations*

Assessment for this lesson can be based on a variety of tasks, depending on instructional goals. First, students' discussion. Do they have an understanding of the complexity of AI image generators and copyright? Second, students' presentations. Did they summarize and report their findings effectively? Third, students' research. Did they efficiently find sources? Did they use good keywords?

## Lesson Plan 3: AI Image Generators and Bias in the Dataset

### *ACRL Framework for Visual Literacy Theme(s) Addressed*

- Learners pursue social justice through visual practice

### *Learning Objectives*

- Students will research and discuss the datasets of various AI image generators, paying particular attention to information about policies to mitigate bias and bias in the dataset in order to:
  - Acknowledge that no platform is neutral, and that concealed factors like suggestion algorithms and power structures within the publishing industry shape experiences with visuals. [Authority is Constructed and Contextual] [Information Has Value] [Social Justice]
  - Anticipate the ways in which algorithms, social media, and participatory technologies obscure or promote visuals and visual media generators, which may reflect commercial interests and reinforce existing social dynamics. [Authority is Constructed and Contextual] [Information Has Value] [Social Justice]

### *Teaching Notes*

- The number of students in each group can vary from 3-4 depending on the size of the class
- AI image generators that can be used: [Dall-e](#), [Midjourney](#), [DeamStudio](#), [Fotor](#), etc.
  - If needed, additional AI image generators can be found through a Google search

### *Activity (75 minutes)*

- Introduce activity
  - Introduce activity (10 mins)
    - Tell students class will focus on AI image generators and their datasets - specifically focusing on bias.
    - In groups of 3-4, students will research how various AI image generators handle bias in the AI image generator's dataset using the AI image generator's website, Google, and library databases.
      - Students should answer the following questions:
        - Does the AI generator acknowledge bias in its dataset?
          - If so, what biases are present?
          - If not, can you find other sources that discuss bias in the AI image generator's dataset? What are the biases?
        - What are the consequences of bias in the dataset?
          - This can either be information you found during your research or additional consequences you consider based on your research
        - Does the AI image generator attempt to thwart bias in its dataset? If so, how?
        - Are there other rules and/or regulations and/or restrictions in your AI image generator's dataset? What else did you learn about your AI image generator's dataset?
        - Why is it important to consider the dataset used by an AI generator?
          - This answer can be related to bias or answer the question more generally
  - Students research an AI image generator (20 mins)
  - Students present their findings to the class (25 mins)
    - Each group is given 5 minutes to present
  - Discussion (10 mins)

- How do the various AI image generators compare and contrast in the biases inherent to their dataset?
- How do the various AI image generators compare and contrast in how they handle bias in their dataset?
- Which AI image generator takes the most steps to limit bias in the dataset?
- Can you think of other ways AI image generators could limit bias in their datasets?

### *Assessment recommendations*

Assessment for this lesson can be based on a variety of tasks, depending on instructional goals. First, students' discussion. Do they understand that AI image generators have biased dataset and that this has consequences in both the images the AI generates and how the AI functions with its dataset? Second, students' presentations. Did they summarize and report their findings effectively? Third, students' research. Did they efficiently find sources? Did they use good keywords?

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