

Adding Generative AI to the Design Curriculum

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Abstract

This year the media is full of headlines that claim that the use of artificial intelligence is threatening the dominance of human creativity in many areas, including authentic original works in literature and the visual arts. Many academics have become concerned about the increasing probability that some of their students might employ generative AI inappropriately when completing their assignments and are looking for ways to detect its use. This concern about the authenticity of creative work produced with technology has been

a controversial topic since Benjamin's exploration of photography in *The Work of Art in the Age of Mechanical Reproduction* [2]. The role of the machine and computers has been feared and disparaged even as each new technology became accepted and used as tools of daily life. Photography today is an accepted art form. Generative AI is just another part of this progress and will not replace human creativity but augment it, including in the classroom and design practice.

To explore the potential and limitations of artificial intelligence, I am adding an AI component to my classes this semester to see how students react and utilize the generative image bots that are currently available to them. For example, in the final assignment of the Foundations of Design class, there is an assignment based on students finding a contemporary designer relevant to their personal concept of identity (race, ethnicity, gender or neurodiversity). They then research and develop an annotated bibliography of at least five scholarly references and prepare a pre-recorded narrated six-minute Pecha-Kucha presentation about their chosen designer's use of the elements and principles of design in their work. Then, they create an original design project based on the designer's style using any program in the Adobe Creative Suite. Another place where AI could be used is in my introductory web class. In this assignment stu-

dents create two personas for a web project. In the past they have represented those personas using royalty-free stock photography or by illustrating them in Adobe Illustrator. Students also generate images for use in web projects throughout the course, including a Halloween poem and an image gallery on found type.

This semester the design foundations students will use the parameters of their chosen designer to write a prompt instructing an AI bot to create a generative version of their original project. In the web class, students will create a generative AI representation for each of their personas using a prompt that is based on the list of characteristics of their personas.

Boris Groys, speaking about current AI bots, observes that writing a good generative AI prompt requires skill. In fact, to obtain a satisfactory result, the user must craft a prompt informing the bot of his intent to deliver “relevant and accurate responses” [5]. I am anticipating that in the above assignments, what students create by themselves and what they craft with the AI bots will have very different outcomes. The comparison between these versions will highlight the issues and advantages surrounding the role of human creativity and critical thinking presented by AI in the classroom.

An exciting aspect of these generative image bots is that the prompt writing requires a digital literacy and clarity of purpose that is akin to using a search engine. The more accurate and descriptive the language of the prompt is, the more the outcome matches the desired result. Exploration and play through the bot and the created image can often return remarkable, unforeseeable results.

To record and assess students’ reactions, a post-assignment survey with open and

closed questions will track their perceptions of how easy or difficult they found different aspects of creating a directed project with AI. I will also evaluate the success of this part of the assignment using a grading rubric that measures the mastery of concepts, design, and execution students have shown in their projects. The evaluation of the physical design artifacts, survey and rubric results will help me decide how AI can be used more effectively and in other areas of the design curriculum. I believe that this evaluation of the assignment will yield, at the very least, interesting information about the potential benefits and disadvantages of using AI in the classroom and will underscore the idea that generative AI is just another addition to a long list of the ways in which humans have extended their intellect and creativity through new technologies [6].

Preface

Plato, speaking about writing, remarks that it is a mimesis of knowing [7]. A similar argument was made about the mechanical revolution and photography where critics perceived the loss of the human aura in photographic reproduction [Benjamin]. Digital reproduction has also been challenged as creating “a profound change in society, man and human perception” [3]. In a similar fashion, AI image generation is seen as a negation of authentic artistic creation; many sceptics, exhibition curators, and jurors refuse to recognize any works which incorporate its use, labelling them as unworthy of being classified as artistic creations. No matter what the apparatus is—camera, computer, algorithm, or voice prompt, human beings use that apparatus as an extension of themselves to create artistic expression [6]. Instead of forbidding AI

image generation in my class in the classroom, AI-produced images were incorporated in design assignments to study what students thought about using this technology and to compare the results with more traditional graphic design workflows. What follows is an account of how generative images were incorporated into assignments, student reactions to this component, examples of student work, and conclusions about the place of generative art in the design curriculum.

The Data Portrait Assignment

In the Design Foundations class, two assignments used AI image generation. The first assignment asks students to create a silhouetted portrait of themselves which they create by filling or outlining the portrait shape with keywords describing who they are. This assignment was loosely inspired by an MIT Twitter data portrait where the human form was used “as a frame for the visualization, but not as a carrier of information.” [6] This assignment is an introduction to thinking about the role of data, visualization and artistic representation. The student is asked to play with the artistic genre, using the principles and elements of design, to create a data portrait of his/her/their individuality for the project. As Donath observes, “there is a trade-off between expressivity and accuracy: the artist’s vision, which can render the subject distinctly and vividly, [but] also distorts the portrayal.” [6]

Just how realistic or distorted this self-representation becomes evident in the second part of this assignment; using the portrait characteristics and the keywords in the data portrait, students fashion a

prompt to reverse engineer the first part of the assignment.



Original

AI Prompt: *best girl anime series, red braids, red jacket, anime style, 100% accurate*



Original

AI Prompt: *best girl anime series, pink dress, cherry blossoms, anime style, 100% accurate*



Original

AI Prompt: *best anime series, glasses, yellow and white striped shirt, anime style, 100% accurate*



Original

AI Prompt: *best anime series, curly hair, sitting at a computer, anime style, 100% accurate*

Student Work from Data Portrait:
Prompts from individual keywords to
create an image of the student.

In these comparisons of data portrait and AI prompts, one can clearly see a thread

of commonality to the actual physical appearance of the students. However, it is clear that the generated art is much more realistic than the assignment which deals in an abstract word usage. In the survey comments, students remarked that they needed to add a lot of descriptive phrases to get images that resembled them, using racial, gender, age and even hair characteristics. There is a sort of perfection in the generated portraits which shows the limitations of current AI technology in regard to creating images that resemble the majority of humans. My students are not perfect. Unlike them, no one is fat, there are no pimples, and all facial features are symmetrical. Even when one asks for imperfections, the results are hardly different. These representations lack the flawed and unique characters of the actual students. They remain stereotypes, not individuals.

The UX Persona Assignment

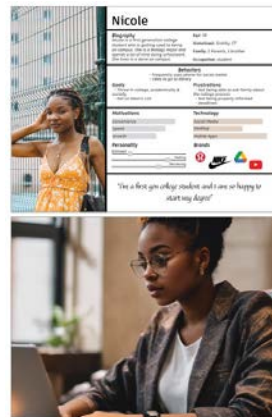
Another assignment that generates word prompts with a visual representation is the creation of UX personas. In this assignment students created stereotypical users with imaginary names, characteristics, goals, and pain points. The first version of these personas used illustrations or royalty-free images to give shape to the persona. Using the language that described each persona, students then created a prompt to generate “photorealistic” AI generated characters. Once again, there is a clear relationship between the two versions. One can notice that the background tends to be richer in the generated versions. Students played with styles, and as noted in the comments, they often had trouble with hands and had to crop the photos.



Student Work for UI Personas: Playing with illustration styles and richer backgrounds are evident in the generative backgrounds.



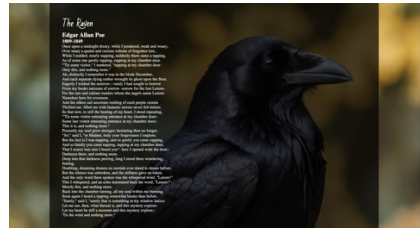
More Examples of Students generating images for personas and better context results than when they searched for royalty free photos



The Halloween Web Poem Assignment

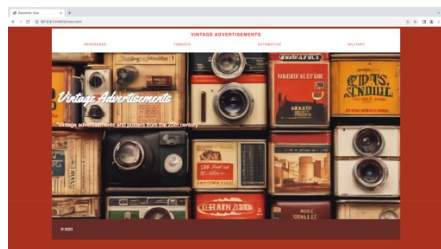
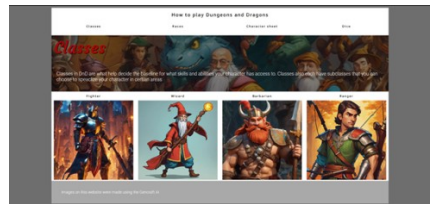
Although I have a paid subscription to Mid-Journey and invited students to use my computer, they frequently used free image

generators like GenCraft.com and StableDisufion.com that allow them only 5 -10 images a day. While students initially had trouble with hands and limbs that were malformed, the second week of using AI I would frequently walk into class and find students using their daily quota creating images on many topics. They quickly found ways to deal with these limitations, such as crafting better prompts and editing results in a photo editing program such as Photoshop. As we started creating simple one-page responsive web pages, several students generated images instead of seeking royalty free images. Inspired by their interest, I asked the class to create a version of a poem about Halloween from a provided list, and to add a royalty free image. I then asked them to duplicate the page and generate an image as similar as possible for the new page. Several of these results are shown here:



Generative images for responsive Halloween websites.

These results are very successful, and students created images that enhance their topics well. This suggests that generated images can be integrated into a design flow to enhance traditional images and typography. In the flexbox website assignments, students combine generative background images with photos and screen grabs of found type.



These web examples show how AI generated images combine well with photography and type.

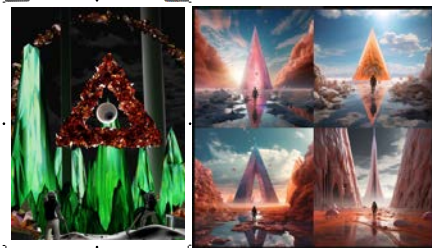
In the Style of Assignment

The last assignment where I had students generate images was the final project for the Design Foundation Class.

In this assignment students find a contemporary designer who relates to their personal concept of identity (race,

ethnicity, gender or neurodiversity). They then research and develop an annotated bibliography of at least five scholarly references and prepare a pre-recorded narrated six-minute PechaKucha presentation about their chosen designer's use of the elements and principles of design in their work. Next, each student creates an original design project employing the designer's style. Finally, the design foundations students use the parameters of the chosen designer to write a prompt for an AI bot to create a generative version of their original project. Some of the original work can be compared to the generative work and could have been successfully incorporated into their assignments.

Some original projects are seen above; generative images with four variations are to the right.



Students used Midjourney to create a generative work that was in the style of their "In the Style of" completed project.

Survey Results of Students' Reaction to Using a Text to Image Bot

The survey was not compulsory, but classroom time was scheduled to complete the survey. Four classes participated in the survey with class size averaging 17 students per class. Students ranged from freshman to seniors in the classes. Below is a list of questions and a summation of the student replies from a survey on AI use in these assignments:

Question 1: What software did you use?

In general, the class used GenCraft.com and StableDisfusion because it allowed the generation of ten free images a day with use of the general features including style and aspect ratio. The majority of students had not used any AI text to image generator, although many students had previously used the site, <https://this-person-does-not-exist.com>, which is a random face generator that selects images based on drop downs that includes:

- Gender
- Age
- Ethnicity

Some students had used various beta versions of "Dali-e" (<https://openai.com/research/dall-e>) and had tokens left to use for class projects. Another student used "Imagine.Art" (<https://www.imagine.art/>) because his brother was using it and he had access to

that account. A number of students used my "Midjourney" (<https://www.midjourney.com/app/>) account.

Question 2: What phrases did you include in your prompt?

Some students felt that simple descriptions were best:

- just simple descriptor
- Active hiker.
- Normal man going to the gym after college class

Others found that being more specific gave better results:

- I had to include a lot of descriptors about race as the AI will assume any ethnicity if given no adjectives. I wanted an image of a white woman eating Chinese food and had to specify it was a white woman and even so it was a 50/50 shot if it would generate her as the correct ethnicity or not.
- Since I had to generate an image for the two personas in the project, I included the age and occupation along with a small detail about them. For the first image prompt it said, "18 year old new college freshman student going to Central Connecticut State University who is very into their studies, plans to have a journalism major, and eager to start class!" The other personas prompt said, "male 55-year-old, retired New York *Times* editor who goes to universities to give guest speeches on journalism."

Many prompts included gender, age, race and profession to get the results they needed:

- For one of our personas, I looked up "Middle aged college professor headshot", and for the other persona I looked up "Female college student headshot."
- In my prompt, I used " trendy college woman student in graphic design" as well as "trendy college freshman student in graphic design."
- "A young girl in her 20s, traveling for the first time, in an airport, carrying luggage, wearing a jacket."
- "A man in his mid-70s, wearing glasses and a sweater, who has lost his luggage at the airport."
- black college student eating at a Chinese restaurant
- silhouette, tall, goatee, Caucasian, baseball cap, mullet, nice, kind, friendly, loyal, athletic, 19-year-old, student.
- black girl, student, red locks, Jason Todd, horror. quiet, dc writer. emoji user, shy, quiet
- white, skinny fit, looking sideways, glasses.

Question 3: Have you used AI before?

44% of students have used AI before. This result includes text generation, including "ChatGBT"

Question 4: Were you pleased with your result?

78% of students were pleased with the results of their completed work using AI text to image generation.

Question 5: What surprised you using AI?

The speed and improvement of AI surprised many students, although several students found a bias in the results especially towards race and attractiveness of the people generated. General features like hands were still sometimes an issue. However, in general, the speed and detail of the images were a real positive for students.

Here are some of the comments from the survey:

- I think that AI has gotten to a point where it's very mainstream and almost predictable.
- I was surprised about how far AI has come considering the last time I used one, especially for the image being generated on a free program. The only thing that looked kind of strange was the eyes of the New Student. Her eyes had a strange redness and they seemed as though they were at the wrong perspective.
- How fast and surprisingly accurate the process has become since I have last used an AI software.
- I was surprised that the image was pretty accurate once I added more details to my prompt.
- That the results based on my descriptive search would come out faster than you personally working on it. AI is very accurate, except for hands. In some of the

headshots, AI placed their hands in frame and we had to regenerate new images because it was very inaccurate.

- I knew that when I put in the prompt the results would be white people, the photos I chose for my personas were people of color.
- What surprised me with the AI is that even though it can generate images really well based on the description you give it the images can still come out wonky and incorrect looking.
- For my first attempt at creating a male persona, I got a male gymnast with several arms and legs. I noticed that I have to be really specific when I'm creating my AI generated image.
- It's surprising how real some aspects of the AI-generated photo will look, and then how unrealistic/unnatural something will look in the same photo. It is able to accurately generate some things, but with other aspects, like hands, it has a very hard time doing so.

Question 6: Did you revise your work or recreate it to get a better result?

61% of students revised their work to get a better result that worked well for the project parameters.

Question 7: If you revised your work, how did you do this and how many times?

Many students did revise their work and they honed their skills at creating better prompts as can be seen in several of the responses:

- I revised the prompt a few times to try and get the computer to recognize what type of person I wanted in the image but didn't have much luck.
- I tried changing a few words and used a different style to see what would happen. I did this for two days since we were only allowed to have 10 prompts per day.
- On the software, if an image had something that was distracting or wrong, I just put a prompt subtracting the imperfections, example being no blur, no hands, etc. This was done about 4 to 5 times as by getting rid of 1 defect, another although less distracting one would pop up.
- I included their race in the description to get more accurate results to match the personas I had chosen.
- I revised the image a couple times until I was satisfied with what I got. To change the description I just added a new phrase like with normal hands so the girl I was generating would have two hands instead of the three or four it was generating before.
- I'd revise my work twice and read though it thoroughly. I specified a shorter length of hair since all the results were giving the AI long hair.

Question 8: Thinking about the project that you made using Adobe Creative Suite, how do the results compare or differ?

Students would continue to use the Creative Suite and even stock photography, but many would include AI generate images in their workflow in the future because of the detail of the speed of the process and the quality of the images.

Here is a sample of what students had to say about using the traditional software, stock images and AI generated images:

- The results differ because what I made myself is clearly of higher quality than the artificial intelligence.
- I would say that the free images I found were definitely more accurate and better personas than the images generated from AI. Real photography is accurate and outshines the result of an AI. The photos of the personas show emotions and none of the traits seem to compete with one another. For example, the eyes on the AI New Student looked as though the two eyes are angled at different perspectives.
- I enjoyed the results of AI because it was much more convenient. Instead of searching for copyright free images, I could just put in a prompt and get a copyright free image that is completely tailored to my project.
- The results are different in the sense where the persona I created with AI seems more unique than something I would have done in the past.

- The AI work, due to the pictures being an amalgamation of images, tends to look more professional than the non-AI work. The non-AI especially the male picture looks like just a picture taken in-house rather than done in a photography studio like the AI one.
- I think if I were to use the AI photo instead of the royalty free photo, it would not have made much of a difference. They look pretty realistic. At first glance it would be hard to tell it's AI right away. After getting the description right the personas look similar.
- Using Adobe Creative Suite, I was able to make my work the way I wanted to. I'm in the control of the persona I create by giving them a bio and creating a journey map. Using different tools within illustrator allowed me to be creative as possible and stay consistent with the project guidelines.
- Using Illustrator allowed me to have total creative freedom, where AI was just straight forward, you get what the AI gives you.
- I can find the person with the exact looks I want online with a bit of searching but AI will struggle to do so to an extent. Due to the complete randomness of the systems at times you could generate the perfect image right away or it'll take several attempts before you get what you desire. Ultimately, both processes get the same end result but it

depends on the speed at which you find what you are looking for.

Question 9: What were the advantages of using AI to create your work?

Most students thought the speed and even the expression of prompts and were a positive aspect of using generated images. A few students would use it only for inspiration for work. Most students thought this was a skill that needed to be perfected and allowed them to be creative. In other words, AI generation of images was an extension of their imagination and a part of human creation, not endangering the artistic process but enhancing it:

The following is a sampling from the survey:

- The advantages lie in the free use aspect of creating free public domain images that can be used in any way because they aren't owned by anyone.
- It created some convenience when looking for a subject to model as a human being for the project, instead of having to take a picture of a real person
- The advantages were that I didn't have to search the web for the exact image I wanted and could instead just type my description into the prompt generator.
- The advantages of AI are the personalization. It is difficult at times to find images on the web that fit the criteria for what you need it for, so it is very convenient to type in a prompt

and get the results you are looking for in just seconds.

- The advantages are that AI helps create unique work based on the prompt the user writes compare to searching the web for an image.
- AI gives you a fast, original, and relatively error free image to work with.
- You can use your creativity and see what AI comes up with.
- The AI was able to somewhat generate an accurate photo of what I described.
- I can see it being useful in a pinch and maybe for generating very specific images or backgrounds. Otherwise I would say the systems are still a bit too experimental to be used seriously but I digress as I have not used every AI program available today. Easier to find specific assets
- It generates a concept of an idea for people to gather inspiration from.

Question 10: What were the disadvantages of using AI to create your work?

Disadvantages had to do more with learning how to generate images through text prompts and inaccurate people. Most students were not concerned about using AI and saw it as just another tool.

- Some would say that using AI is disingenuous and a cheap way

to work on something, opinions differ constantly but I think there was no inherent disadvantage to this process.

- The disadvantage is that the AI doesn't always generate images that are believable, accurate to the human's anatomy, or can have multiple contradicting traits added to the image. Along with this, AI could be using already copyrighted images into their generated images, which could result in issues later down the road as a Graphic Designer.
- Disadvantages are it can be difficult to get exactly what you are looking for and the technology is imperfect resulting in some weirdly distorted images that look uncanny.
- The disadvantages were the times AI got it wrong; it takes a bit of tweaking in the prompt to get your images just right which can take a little extra time.
- The disadvantages of AI are that the user has to be careful with their words, they can cause it to change the image more than the user might like. For instance, I wrote college senior, and it created an image of an old man in college.
- It is not always precise with what you want. you have to be careful choosing the right words.

Question 12: Creating this project using just the Creative Suite and AI, what did you learn about AI?

Most students found AI helpful but would not replace traditional workflows. AI would just be another tool to add to the workflow.

Students did find that AI image generation required patience, time and skill.

- I learned that there's still many limitations with this technology despite it being so widely considered to be a major threat to creation and artist in today's climate.
- I learned that while AI is fun, it is very temperamental and requires a bit of patience.
- What I like about AI is I can use it to help me brainstorm for another project where I can't put the images in my head together.
- I learned that AI is rapidly growing every day and changing the way we do our work. It's quickly becoming the norm in our world.
- I learned that the closer to the beginning of the prompt the more important it is to the AI. I also learned that the more you type and more specific you are the closer to your desired outcome you will be. Kind of contradictory but hey that's just how it is.

Question 14: how likely are you to use AI in a project again?

Most students fell into the middle range on their belief that they will use AI again.

Observations and Future Use of AI in the Classroom

The integration of generative images into design assignments has been well received by my students. Their comments demonstrate that they do not see generative art as replacing creativity, but

rather as an enhancement to the design process and workflow. One student comment in the collected survey summarizes this well:

Overall, AI is a powerful tool that can both make the work easier for individuals who already have the skills to independently create all sorts of work by handing out some of the mundane aspects of work creation to the system; while also giving those who struggle in a specific field...a safety net that can elevate their work. While far from perfect at this point in time, the individuals still have to be able to give directions to the system in order to make it work like one wants to.

The point is that these new tools of image generation should be treated as a part of the curriculum as these explorations augment creativity help students develop information literacy. Just as we craft search engine terms for better and more relevant results, “[t]he art of writing prompts is...becoming increasingly crucial to the future of human-AI communication.” [5]

While many expect life to be lived in a virtual reality that shifts the ethics and personal perceptions of life [8], others believe that augmented realities will be increasingly a part of daily life. [1] We are already living in a world ruled by “the omnipresence of screens.” [8] The examples of student work incorporated into this research and the reactions of students make it clear that there is a place for generated images in the design curriculum. The resulting work of my students reflects individual creativity while drawing upon and expanding the collective zeitgeist. [5]

[1] Anderson, J. (2022, June 30). The metaverse in 2040. Pew Research Center: Internet, Science & Tech.

<https://www.pewresearch.org/internet/2022/06/30/the-metaverse-in-2040/>

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