

# Generative AI in Student-Directed Projects: Advice and Inspiration

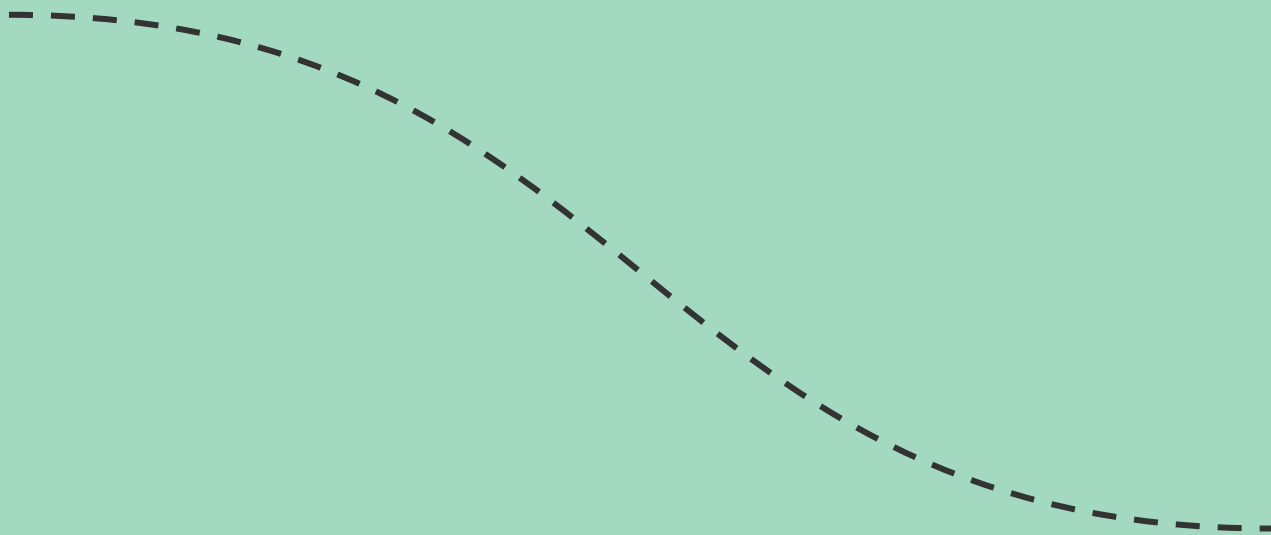


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Karen Brennan, Paulina Haduong, Avantika Kolluru, Sally Yao, Jacob Wolf

*Harvard Graduate School of Education*

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# INTRODUCTION

*“It’s not whether AI is greater than you.  
It’s whether you plus AI is greater than you.”*

*– Andrew Ho, Professor, HGSE*

Student-directed projects, projects that are directed by students in content and process, can serve as personally-meaningful contexts to develop experience and fluency with a variety of skills, concepts, and disciplines. But it can also be hard for students to define goals, figure out project scope and tasks, and concretely manifest their creative visions.

“Student-directed” does not mean working completely autonomously. In fact, students working on self-directed projects benefit from a wide variety of scaffolds and supports. In this moment, generative artificial intelligence (GenAI) is becoming increasingly accessible as a new form of support. When we say GenAI, we are referring to tools—like OpenAI’s ChatGPT or Harvard’s custom AI Sandbox—that can generate text, images, or other content, in response to a prompt.

Based on our own experiences as teachers and students, we were curious about how GenAI could serve as a productive support in student-directed projects. This guide, which was generously supported by the Harvard Initiative for Learning and Teaching (HILT), emerged from our exploration of that curiosity.

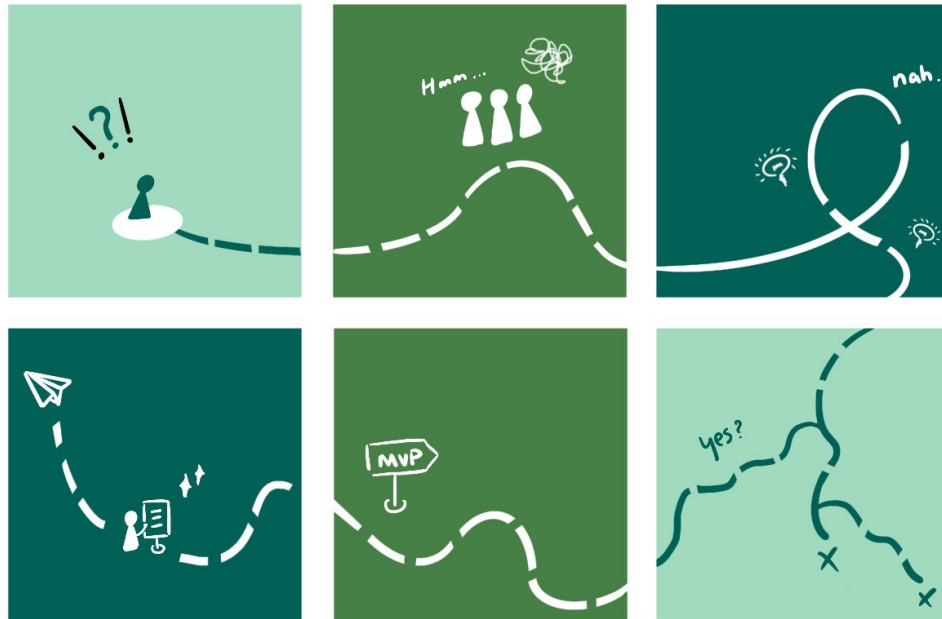
This guide contains advice and inspiration for how GenAI can support self-directed projects, supporting students as they navigate the uncertainty and opportunity of work that isn't prescribed, work whose outcome isn't guaranteed or known. We hope that this guide can support students and faculty in exploring how GenAI can be used in service of students' goals and desires.

## Our process

In Fall 2023, we taught the core required course for Learning Design students at the Harvard Graduate School of Education (HGSE). Students in the course developed a term-long self-directed project focused on designing a learning experience. Every student worked on a project—but what they worked on, and how they worked on it, was up to them.

With the new attention to GenAI, we wanted to understand how students in the course were using these tools in their project development. We were also curious about how faculty colleagues who teach project-based courses were thinking about the challenges and opportunities of this particular technological moment. We interviewed 27 HGSE Learning Design students and 7 HGSE faculty members.

Before the student interviews, we asked each student to prepare a map of their project-development experience, marking major milestones of the journey and indicating what supports and tools were important along the way, including GenAI. This process orientation helped us understand the many different activities that are involved in a multi-month learning design project.



In addition to process questions, we asked students to share their broader thoughts about student-directed projects and GenAI. The faculty interviews were similarly structured, but oriented towards their students' work rather than their own use.

Of course, these interviews reflect a particular moment in time and a specific set of students. Regarding the particular moment, we hope that this documentation can serve as a record of what felt possible to people at the beginning of expanded access to a powerful new technology. Regarding the particular students, we worked specifically with graduate students focused on learning design. But even if you don't work with graduate students or focus on learning design in your teaching, we hope that ideas about creative, student-directed design projects may nonetheless ignite your pedagogical and design imagination.

## Advice and inspiration

In our conversations with students and faculty, we heard lots of wonderful general advice and beautiful specific examples for using GenAI in student-directed projects. Our aim with this guide is to share both the breadth and depth of what we learned. First, the general advice:

**Consider the broader impacts.** Students and faculty emphasized the importance of thoughtful use, identifying a number of serious concerns associated with using GenAI, from its tendency to hallucinate, substantial environmental footprint, accessibility barriers due to cost, potential homogenization of culture, and inherent algorithmic biases. The advice was clear: approach GenAI with intention and awareness of its limitations and potential harms.

**Preserve learning and authentic voice.** Another recurring theme was the value of using GenAI as a support, rather than a replacement, for personal thought, effort, and style. As one student explained, “I think it can be a second brain for you if you’re feeling a little stuck. You can ask it to help you get started, but it can’t do everything for you. You’re still the pilot and it’s just an assistant.” Students described the challenges of deciding which tasks to delegate to GenAI and which to tackle themselves. As another student advised, “Really think of what you want at this moment. Do you just want to get the job done, or do you want to learn?”

**Embrace play and experimentation.** Both students and faculty emphasized the importance of hands-on exploration across different GenAI tools. “Definitely use it and explore it,” one student advised, while noting, “It can’t do everything for you. So be strategic.” Faculty members echoed this sentiment, with one stating, “You’ve got to play around, get a sense of things. You can’t help students until you’ve got a feel for it yourself.”

**Practice strategic iteration.** Students shared how they learned through experience that success with GenAI requires multiple attempts and prompt refinements. As one student observed, it “won’t give you the right answer right away after the first try, and you have to revise it a little until you get the answer.” However, they also cautioned about the learning curve associated with new tools, acknowledging that sometimes existing methods might be more effective. As one student wisely advised, after relating a particularly protracted experience with GenAI, “If you’re finding that you’re going for six hours, and maybe you should have been done by now, maybe you should stop.”

This guiding advice is accompanied by specific examples to inspire use in action. The rest of this guide offers a collection of strategies for using GenAI in student-directed projects.

The strategies are presented in a sequence inspired by the order of activities we saw and heard described by students in their maps. We heard about the early experiences of their projects, developing ideas about the project space and exploring project possibilities. We heard about the long messy middle, creating prototypes that serve as concrete representations of thinking, shared with others as part of an iterative process of revision and refinement. These strategies were used throughout the process.


Each strategy is presented with a short title, a brief description, a student reflection, and an example of the strategy in action.



## BASE LAYER

Remix music, art, and other media samples


“ With some of the music, I'll have GenAI generate something. And it was like, all right, this is an option that was given to me. I'll just add on top and use it for speed and inspiration.




46

**Project:** Video game about uncovering mysteries in an abandoned library with friends

**Prompt:** Combine classical and electronic elements to create a 1-minute instrumental track for a video game about uncovering mysteries in an abandoned library.



Excerpt generated with Suno AI



Track remixed in GarageBand

### Strategy example

The example of the strategy in action includes a project overview and a prompt for a GenAI tool that could support the project work. All projects and prompts are inspired by students' actual projects. The prompts in this guide were used to generate output from GenAI tools, but the tools are in ongoing development; if you try a prompt in the same tool today, the output is likely to vary.

Where possible, we have included examples only from tools that offer a free tier, but GenAI tools have a variety of pricing models. We hope that this guide offers inspiration for how GenAI might be an additional resource for your own self-directed projects or supporting others' self-directed projects.



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# A STARTING POINT

Gather information, inspiring future directions for research

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*GenAI is a good starting point to gather the information. For example, my friends would ask, 'What is the solar eclipse?' They would ask ChatGPT instead of Googling. If they want to know more, they will go to YouTube, they'll read an academic paper, et cetera.*



**Project:** An 8th grade physics lesson to learn about an upcoming solar eclipse

**Prompt:** What is a solar eclipse? How can I safely observe it?

## 🔗 Sources

What Is a Solar Eclipse? |  
NASA Space Place

 spaceplace.nasa · 1

What Is a Total Solar  
Eclipse? | Britannica

 britannica · 2

What is a solar eclipse? |  
University Relations and  
Marketing

 communications.... · 3



Show all

## ✦ Perplexity

### What is a Solar Eclipse?

A **solar eclipse** occurs when the Moon passes between the Earth and the Sun, casting a shadow on Earth that blocks out the Sun's light. This phenomenon can happen only during a new moon phase, typically occurring two to five times a year. There are several types of solar eclipses:

- **Total Solar Eclipse:** The Moon completely covers the Sun, leading to total darkness for observers in the path of totality. This can last for a few minutes, allowing viewers to see the solar corona, which is usually obscured by the Sun's brightness <sup>1</sup> <sup>2</sup> <sup>3</sup>.
- **Partial Solar Eclipse:** The Moon blocks only part of the Sun, resulting in a crescent shape as seen from Earth <sup>1</sup> <sup>4</sup>.

*Excerpt generated with Perplexity*

# BRAINSTORM

Chat with AI to develop project ideas

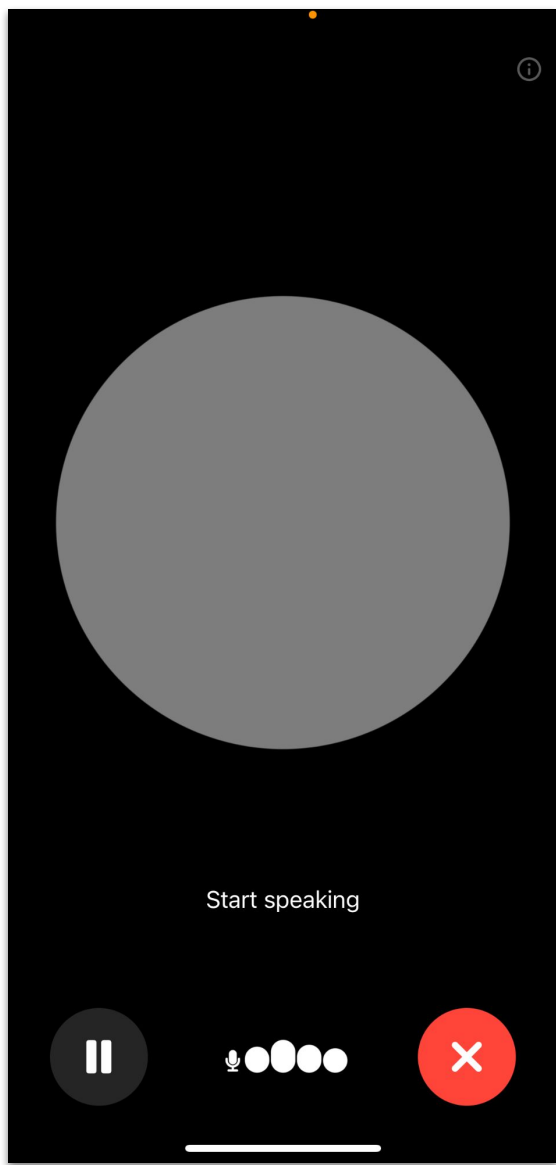
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*One of my absolute favorite parts of AI right now is the conversational part of ChatGPT. I put my AirPods in, I walk home, and I have a full conversation about what I'm wondering and how I would build this. I ask so, so many questions, and I get so many answers.*



**Project:** A platform where users can share stories about various geographic locations



I've been meeting a lot of new friends lately and have heard many cool stories related to different places on campus. I'm thinking about building a platform that collects interesting stories people have with these different locations, and shares them with people who pass by these locations.



That sounds like a fantastic idea!

Here are a few things to consider as you develop this platform...

How do you think I should build such a platform? Are there any similar products out there?



Depending on your resources and technical expertise... Would you prefer to start with a web-based platform, or are you leaning towards something mobile-first?

*Excerpt generated with ChatGPT 4o*

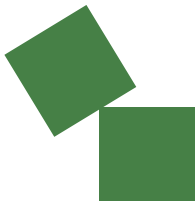
# STRUCTURE THE CHAOS

Generate a timeline with goals, activities, and deliverables

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*I mostly use AI to organize myself. What are the steps? Hey, here's my idea. Break it down in manageable steps. I have 12 weeks to accomplish this big vision I set for myself – break it down in weeks and days. I'm organized chaos, and I need help structuring myself.*





**Project:** A museum exhibit for middle school girls to learn about astrophysics

**Prompt:** I want to learn about how to design interactive museum exhibits which incorporate new technologies for middle school girls. I have six weeks. How should I organize my project plans and deliverables?

### **Week 1: Research and Planning**

#### Objectives:

- Conduct essential research on interactive exhibit design and new technologies.
- Define exhibit goals and key messages.

#### Activities:

- Research interactive exhibit design principles and new technologies.
- Create a project brief outlining objectives, target audience, and key messages.
- Develop a basic conceptual layout of the exhibit space.

#### Deliverables:

- Project brief document.
- Basic conceptual layout.

### **Week 2: Conceptualization**

#### Objectives:

- Develop exhibit concepts and experience flow.

#### Activities:

- Brainstorm multiple exhibit ideas that align with your chosen theme.
- Create storyboards for each idea, detailing visitor experience and interactions.
- Get feedback from potential users (e.g., middle school girls, educators).
- Refine and select one or two top concepts.

#### Deliverables:

- Detailed storyboards for 1-2 exhibits.
- Feedback summary from user testing.

*Excerpt generated with ChatGPT 4o*

# DEFINE IT

Explore related concepts or constructs

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*I asked AI, what are the features of this construct? What is student engagement? AI told me it's 20 things. I didn't think of some of those things, or others were repetitive. I could combine these two points. AI helps you understand what might be considered part of this construct.*



**Project:** A study on how student agency relates to teacher-student relationships

**Prompt:** What is “student agency”? What are its features? How might these features relate to each other? Cite your sources.

**Student agency** refers to the degree of control, autonomy, and power that students have over their own learning process. It involves students taking an active role in their education by making choices, setting goals, and engaging deeply with the material <sup>1</sup> <sup>2</sup>.

### Key Features of Student Agency

1. **Voice and Choice:** Students have a say in what and how they learn, allowing them to pursue their interests and preferences <sup>3</sup>.
2. **Goal Setting:** Students identify achievable goals and work towards them, fostering a sense of purpose and direction <sup>1</sup>.
3. **Initiative:** Students take proactive engagement <sup>1</sup>.
4. **Self-Regulation:** Students monitor and adjust their progress, developing skills in time management and self-assessment <sup>1</sup>.



The Role of Student Agency in Fostering Lifelong Learn...

<https://www.structural-learning.com/post/student-agency>

*Excerpt generated with Microsoft Copilot*

# PERSONA POSSIBILITIES

Explore the potential needs of intended audiences

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*We were trying to come up with personas. We just wanted to see what ChatGPT could do. It wasn't really good at it, but it got us off the ground to think through it.*



**Project:** An app to teach music theory to adults through games

**Prompt:** Generate two user personas for a music learning app targeting adult learners. Please include the following sections in the persona: demographics, goals & motivations, pain points, learning preferences, user quote.

**Name:** Emily Thompson

**Demographics:**

- Age: 34
- Occupation: Marketing Manager

**Goals & Motivations:** Wants to learn piano to relax and unwind after work

**Pain Points:** Feels overwhelmed by complex music theory concepts

**Learning Preferences:** Prefers short, engaging video lessons that fit into her schedule

**Quote:** “I want to learn piano in a way that feels like a break, not another task on my to-do list.”

**Name:** David Mitchell

**Demographics:**

- Age: 45
- Occupation: Software Engineer

**Goals & Motivations:** Interested in understanding the technical aspects of music

**Pain Points:** Struggles with lack of feedback on his progress

**Learning Preferences:** Prefers tech-integrated solutions like AI feedback on his playing

**Quote:** “I want an app that acts like a smart instructor, pushing me to improve.”

# CONTEXT MATTERS

Apply concepts and ideas to personally relevant settings

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*I use GenAI to help with my readings. So, would 'maker education' work in the Indian context? Are there any organizations working there? I ask GenAI these kinds of questions to contextualize to the populations I work with back in India. You need to prompt by asking specific questions and asking for citations.*



**Project:** Starting a makerspace for high school students in India

**Prompt:** List key differences between the Indian government's and US government's policies to promote makerspaces. Cite sources for all data.

## 🔗 Sources

[PDF] A systematic review of library makerspaces research

📄 scholarworks.indi... · 1

U.S., India officially launch 'Data.gov in a box' - FedScoop

FS fedscoop · 2

Makerspaces – a Less Known Way To Infuse a Culture of Innovation ...

sci@wi science.thewire · 3



View 4 more

## ✳️ Perplexity

While both the Indian and US governments have shown interest in promoting makerspaces, there are some key differences in their approaches:

### Policy Focus

#### Indian Government:

- Focuses on cultivating innovation among youth through initiatives like Atal Tinkering Labs, which aim to create makerspaces in schools <sup>3</sup>.
- Emphasizes using makerspaces to address socio-economic challenges unique to India's geography <sup>3</sup>.

#### US Government:

- Promotes open data and government transparency through platforms like Data.gov <sup>2</sup>.
- Encourages the development of open-source tools and platforms that can be shared globally, such as the Open Government Platform <sup>2</sup>.

*Excerpt generated with Perplexity*

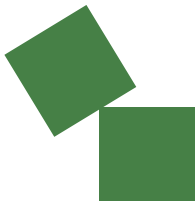
# SCOPE AND SCALE

Focus on vital elements by defining project constraints

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*I don't think we set enough project scope bumpers. I think it would've been helpful to say, 'What is in and out of scope?' I would say to GenAI, 'This is feeling like it's getting too big. How would you scale this back but still bring X, Y, and Z elements, which are the main goals?'*





**Project:** Convening of experts working on climate change adaptation

**Prompt:** The goal of our event is to allow attendees to learn about career trajectories in climate adaptation. In-person panel discussions, speaker presentations, and networking opportunities are vital elements of the event. How long should the event be? What deliverables would we have? What is out of scope?

### **Deliverables:**

- **Event Program/Agenda:** A detailed schedule that includes session topics, speakers, and panelists.
- **Speaker/Panelist Biographies:** Background information on each speaker and panelist to provide context and credibility.
- **Networking Directory:** A list of attendees who consent to share their contact information, offering a resource for post-event connections.
- **Presentation Materials:** Copies or summaries of speakers' presentations, if they allow sharing, to serve as references for attendees.
- **Event Summary Report:** A post-event document highlighting key discussions, insights, and outcomes from the event.

### **Out of Scope:**

- **Extensive Remote Participation:** While some virtual components might be included, like streaming keynote speeches, the focus should remain on in-person interaction due to the importance of networking.
- **Broad Environmental Topics:** The event should concentrate specifically on climate adaptation careers rather than broad environmental issues to maintain focus.

*Excerpt generated with Harvard AI Sandbox (GPT-4o)*

# BOLD BLUEPRINTS

Create a strategic plan based on your vision and goals

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*For my nonprofit, I gave GenAI my mission and vision statements and the general crux of our work. Based on this, what would a strategic plan look like for this nonprofit? I've never built a nonprofit before, and GenAI gave me an amazing outline. Some of it wasn't great, but it gave me a structured document that I could iterate on.*



**Project:** Non-profit to increase mentorship and networking opportunities for youth

**Prompt:** What might a strategic plan for this non-profit look like? Include a SWOT analysis (strengths, weaknesses, opportunities, threats).

**Format:** Online platform that matches young adults with mentors

**Mission:** To connect young adults with mentors who can provide career guidance and access to professional networks



## Strategic Plan for the Non-Profit: MentorMatch

### SWOT Analysis:

**Strength: Unique Platform:** An online platform facilitates easy access and connections anytime, anywhere, breaking geographical barriers.

**Weakness: Matching Efficiency:** Challenges in creating effective matches based on varying mentoring needs and personalities.

**Opportunities: Partnerships:** Collaborate with educational institutions, corporations, and community organizations to expand reach and resources.

**Threat: Regulatory Environments:** Changes in data protection laws and online platform regulations can affect operations.

### Strategic Objectives and Initiatives:

1. **Enhance Mentor/Mentee Recruitment and Retention: ...**

# CONCEPTUAL PARALLELS

Explain difficult concepts through analogies

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*I asked GenAI to break down and explain concepts in a text to me. It was a really terse text and hard to understand sometimes. So, I fed in a version of the text. I said, 'Can you create an analogy?' I didn't always love, or always use those analogies, but it helped me understand the concepts a bit better.*



**Project:** A website to introduce research methods to high school students

**Prompt:** Create an analogy to explain what a “Randomized Controlled Trial” is.



**GPT-4o**

Imagine you are a chef trying out a new recipe for a special kind of cake, and you want to know if it tastes better with a new secret ingredient compared to the classic recipe.

1. **Randomized Groups:** You invite 100 friends over and randomly split them into two groups. One group will taste the cake with the new ingredient (treatment group), and the other will taste the cake made using the classic recipe (control group). This random assignment ensures that any personal biases or preferences of your friends are evenly spread out between the two groups.
2. **Control Group (Classic Recipe):** This group will eat the cake exactly as you've always made it, without the new secret ingredient. This helps you understand the baseline level of satisfaction your cakes typically achieve.
3. **Treatment Group (New Ingredient):** This group will taste the same cake but with the new secret ingredient added. This allows you to see if the new ingredient makes any difference compared to the classic recipe.

*Excerpt generated with Harvard AI Sandbox (GPT-4o)*

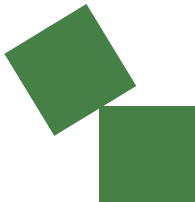
# ROLEPLAY

Simulate conversations with possible users and audiences

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*GenAI helped me take on roles. 'Imagine you are an eighth-grade student, what would be most important to you? As a teacher, what would be most important for you and for your students?' That's when I shortlisted eight product features. I wanted to make sure the eight features were not overboard. Then, I went and had actual user conversations.*



**Project:** Helping online graduate program instructors manage workload

**Prompt:** Pretend that you are a faculty member for an online Software Engineering Master's program. Briefly describe a challenge you are facing with managing your workload.



**Claude 3 Haiku:**

One challenge I'm facing is balancing the personalized feedback I want to give to each student with the volume of assignments...

**User**

What is your current system to provide personalized feedback to each student?



**Claude 3 Haiku:**

Currently, I manually provide personalized feedback. For initial code assessments, I rely on automated grading tools...

**User**

On average, how much time do you spend on manual reviews each week?



**Claude 3 Haiku:**

On average, the manual review of assignments takes me about 15-20 hours each week...

**User**

If you could save time with a faster feedback system, what would you do with the additional time?

*Excerpt generated with Harvard AI Sandbox (Claude 3 Haiku)*

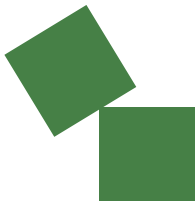
# EXPLAIN IT AGAIN

Learn more by prompting for different explanations

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*You just ask ChatGPT whatever you think. I can say, 'I still don't understand it.' If it was the eighth time it tries to explain, I'm like, 'Explain it with a comparison. Explain it for a 5-year-old. Explain it in this context.'*





**Project:** A 5th grade science unit about global warming and sustainability

I want to teach the concept of carbon sequestration to 5th graders. How should I explain that?



Here's a way you could break it down:

1. **What is Carbon? ...**
2. **Why is Carbon Important? ...**
3. **What is Carbon Sequestration? ...**
4. **How Does Carbon Sequestration Work? ...**

Could you explain this again with a comparison?



Certainly! Let's liken it to a busy kitchen where lots of cooking is happening:

1. **Cooking and Carbon Dioxide ...**
2. **Getting Too Steamy or Smoky ...**
3. **Using the Kitchen Fan ...**
4. **Keeping the Kitchen Manageable ...**

*Excerpt generated with ChatGPT 4o*

# ANALYTIC PARTNER

Offer personalized future directions based on collected data

---



*In class, the first assignment that we had to do was to make a toy for a kid. We had a lot of observation data. After we gathered all the observations, wrote down all of his toys, wrote down what he missed, we put that through ChatGPT, and ChatGPT gave us a lot of different ideas.*



**Project:** Toy fabrication for a 5-year-old boy, based on his specific interests

**Prompt:** I have done an interview and an observation session with a five-year-old boy. I'm trying to decide what toy I could make just for him.



notes.docx  
Document

Here are my field notes. What ideas do you have? I need to be able to make the toy using simple tools typically found in a makerspace.



Based on Alex's interests and interactions from your field notes, here are a few toy ideas that could be made while keeping in mind the makerspace limitations:

- 1. Customizable Kinetic Sand Playset:**
  - What it is: ...
  - Why it's suitable: ...
  - How to make it: ...
- 2. Interactive Track Builder Set for Cars and Dinosaurs: ...**

*Excerpt generated with ChatGPT 4o*

# THE BIG IDEAS

Identify the core of a text

---



*I had been writing what my big ideas and essential questions were. That stuff was really hard. So I started working with it in GenAI. 'Here's the text. What do you think the big ideas are?' I would correct it, modify, or cut, because I disagreed with some of it.*



**Project:** An “egg drop” experiment to learn about NASA’s Mars Rover design

**Prompt:** I’m doing an “egg drop” experiment. Here is a PDF explaining the physics involved in the experiment. What are the 3 most important ideas that students should learn, from this PDF?

 **Llama 3.1 8b**

From the PDF, the three most important ideas that students should learn about the physics involved in an egg drop experiment are:

1. **Forces Acting on the Egg:** Understanding the three main forces—gravity, drag (air resistance), and impact—is crucial. Gravity pulls the egg towards the earth, while drag acts in the opposite direction to slow the egg's descent. The impact force occurs upon collision with the ground, and students need to consider how these forces interact during the drop.
2. **Energy Transformation:** The concept that potential energy transforms into kinetic energy is essential. When the egg is at rest, it has potential energy that converts to kinetic energy as it falls due to gravity. After hitting the ground, this kinetic energy is transferred to the egg and its protective casing, emphasizing the conservation of energy principle.

*Excerpt generated with Harvard AI Sandbox (Llama 3.1 8b)*

# DESIGN FOR EVERYONE

Explore project-specific accessibility recommendations

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*I try to be very specific with ChatGPT. For example, I would ask, 'Hey, I want you to decide whether it's better to use a 14 point or 20 point font, considering the size of the book. What do you recommend for adults? Maybe they're not as comfortable looking at smaller fonts? Or do you think they're already used to it, because they're also on their mobile phones? What do you think?'*



**Project:** A guide for adults aged 65+ to support lifelong learning

**Prompt:** If you are an accessibility expert, what would you recommend I think about when making a physical guide for older adults? Would size 12pt font be okay? What font would you suggest?

Show drafts 



## Accessibility Considerations for a Physical Guide for Older Adults

### Font Size and Type:

- **Font Size:** ... for older adults with visual impairments, **14pt or even 16pt** might be more comfortable.
- **Font Type:** Choose a **sans-serif font** like Arial, Helvetica, or Verdana ...

### Layout and Design:

- **Spacing:** Use **sufficient spacing** between lines and paragraphs to improve readability.
- **Contrast:** Ensure **high contrast** between the text and background...



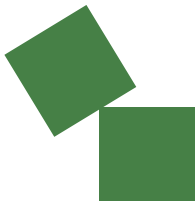
# VISUALIZE IT

Create visual representations of project ideas

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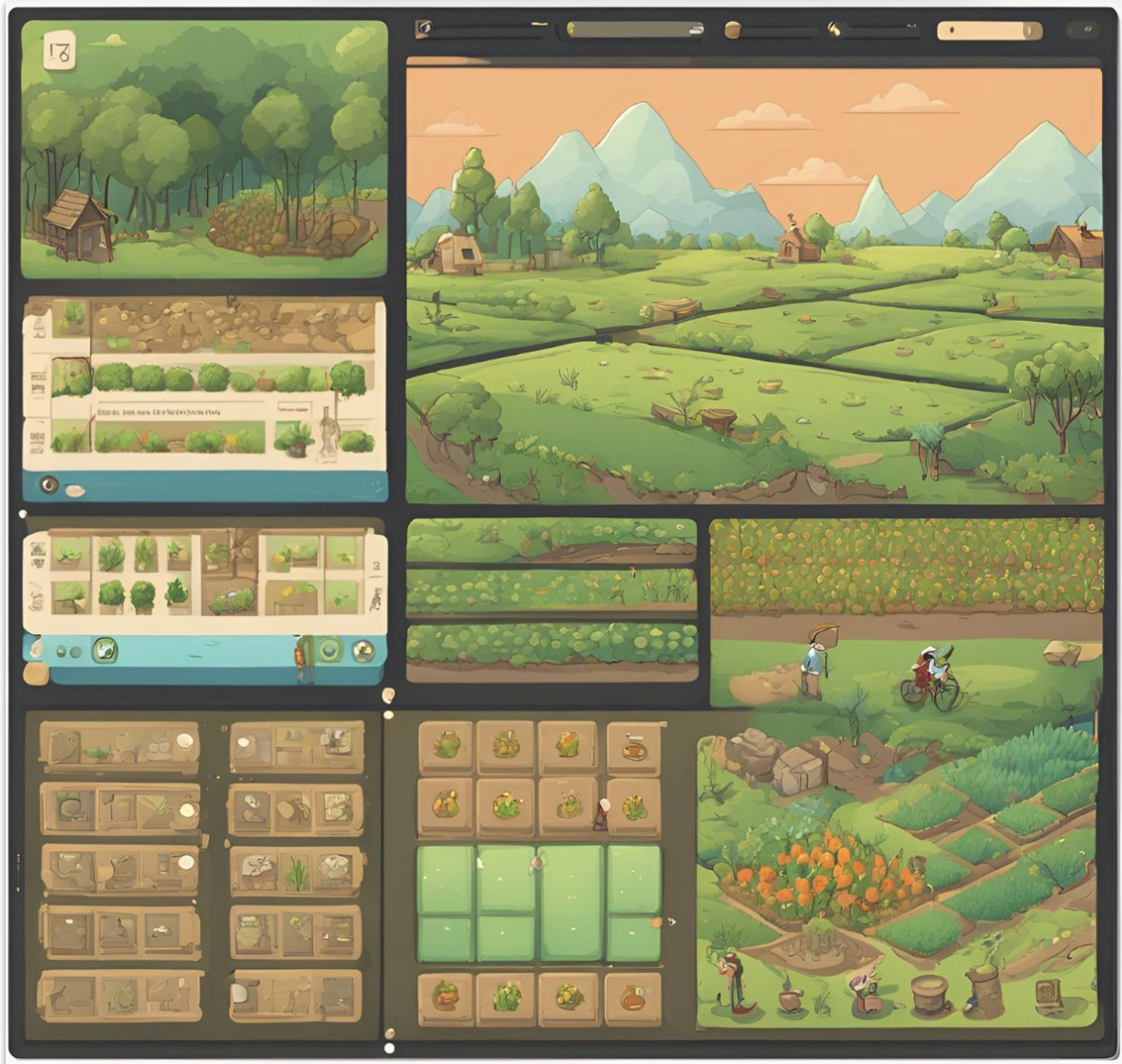
*How could GenAI take what's in my head and put it on paper? Is that possible? Sometimes it can. That's very helpful. Sometimes you just can't know what you're talking about until you see it, and then you're like, 'Oh, that's what I was trying to do.'*





**Project:** Virtual Reality game where friends plant crops and explore magical areas

**Prompt:** A game interface, with a magical farmland, different types of crops, and game interface overlay.



*Excerpt generated with Canva AI*

# DREAM INTO EXISTENCE

Create images that have limited existing references

---



*I needed to dream up something that's never existed before. My idea is to create a math textbook that decolonized mathematical history. It places mathematics in its indigenous history, and those images don't exist. I used Firefly, because I'm not a great artist. That was really helpful in showing people what things could look like that have never existed before.*



**Project:** A children's book imagining climate futures

**Prompt:** A city with hybrid indoor-outdoor spaces, renewable energy, no water waste



*Excerpt generated with Adobe Firefly*

# SURVEY DESIGN

Develop initial survey drafts

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*I came up with a first draft of a questionnaire, but I was struggling to go from this first draft to being able to sort students based on their answers. That's where I used AI.*



**Project:** A survey to group students by their reading habits

**Prompt:** I want to organize student projects around their reading preferences. How should I structure the survey? Should I list literature genres? Would naming specific books in each genre be more effective?



When structuring a survey to identify your students' reading preferences, you should aim for clarity, relevance, and ease of analysis. Here's a recommended structure:

1. **Introduction:** Provide clear instructions on how to fill out the survey.
2. **Student Information (optional):** ...
3. **Genre Preference Questions:**
  - **Question Format:** Use a Likert scale for consistency and ease of analysis. For example: ...
  - **List of Genres:** Fantasy, Science fiction, ...
  - **Open-ended Options:** ... for students to write about any other genre they like ...
4. **Reading Habits:**
  - **Frequency & Volume:** Questions about how often they read and how many books they typically read in a month can provide insights into their engagement with reading.
  - **Previous Read:** Asking about books they enjoyed in the past can help correlate genres with specific titles.



# BASE LAYER

Remix music, art, and other media samples

---

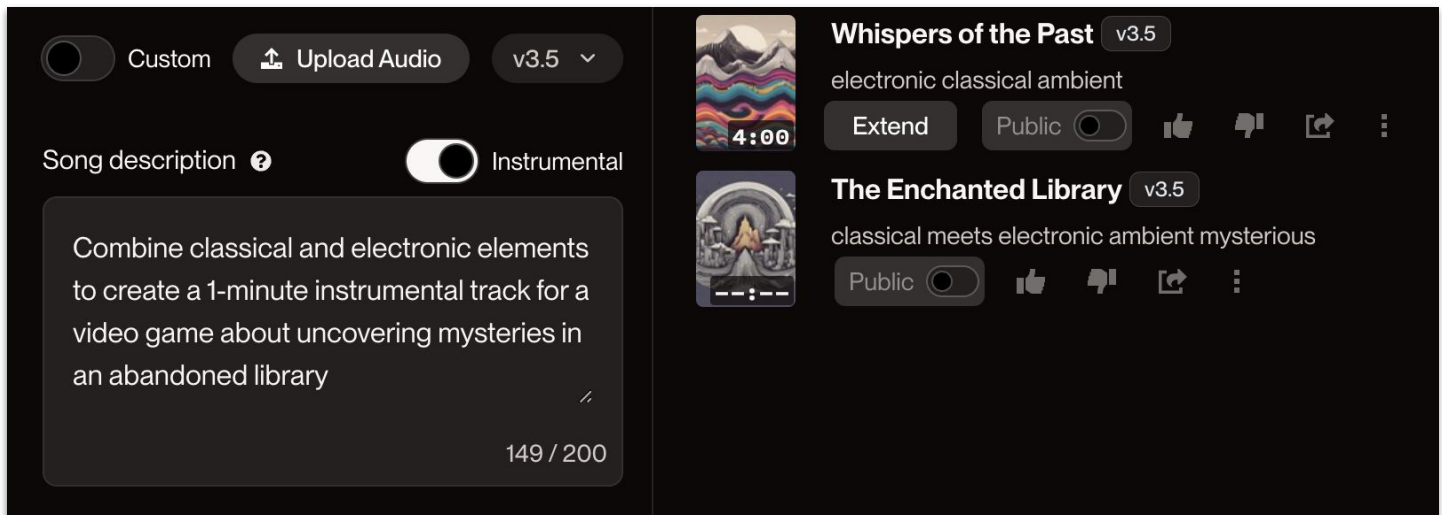


*With some of the music, I'll have GenAI generate something. And it was like, all right, this is an option that was given to me. I'll just add on top and use it for speed and inspiration.*

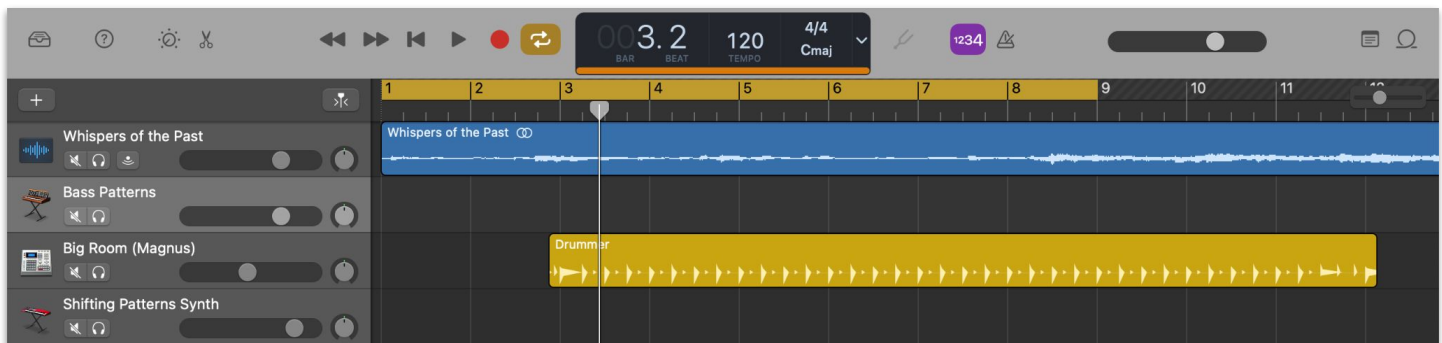


**Project:** Video game about uncovering mysteries in an abandoned library with friends

**Prompt:** Combine classical and electronic elements to create a 1-minute instrumental track for a video game about uncovering mysteries in an abandoned library.



*Excerpt generated with Suno AI*



*Track remixed in GarageBand*

# CASE COMPOSITION

Create custom case studies tailored to specific audiences

---



*I wanted two case studies that workshop participants could discuss. I asked ChatGPT, 'Write three paragraphs showing an example of..' I made edits to align it with the language I wanted. I needed to be specific, because context really matters in a case study. I think I got more out of it than I would've if I just wrote something myself. I was able to try a new technology to get to the same goal.*





**Project:** A professional development workshop for elementary language teachers

**Prompt:** Write 3 short paragraphs, for a case study, about a first grader named Gabby who finds reading difficult. Elaborate how her teacher, Ms. Kendall, explores ways to support Gabby in her reading process, highlighting an interaction between the student and teacher where Ms. Kendall asks questions to scaffold Gabby's understanding.



#### **GPT-4o**

In the bustling classroom of first graders, Gabby stands out as a bright and curious child, but she finds reading particularly challenging. Ms. Kendall, her teacher, notices that Gabby often hesitates or stumbles over words during reading time and sometimes seems to lose track of the story altogether. Wanting to address Gabby's difficulties without discouraging her love for learning, Ms. Kendall commits to exploring different strategies to support her. She starts with informal assessments to identify specific areas where Gabby struggles, such as phonemic awareness and decoding skills. Recognizing that personalized attention might be beneficial, she schedules regular one-on-one sessions with Gabby to tailor her instruction more closely to her needs.

In one of their personalized sessions after school, Ms. Kendall and Gabby sit together with a colorful picture book. Ms. Kendall gently encourages Gabby to read the first page aloud but notices the familiar struggle as Gabby gets stuck on a few tricky words. Instead of correcting her immediately, Ms. Kendall uses this as an opportunity to scaffold Gabby's understanding. "What sounds do you hear at the beginning of this word?" she asks, pointing to the first letter.

*Excerpt generated with Harvard AI Sandbox (GPT-4o)*

# TELL YOUR TALE

Generate voiceover narration for projects

---

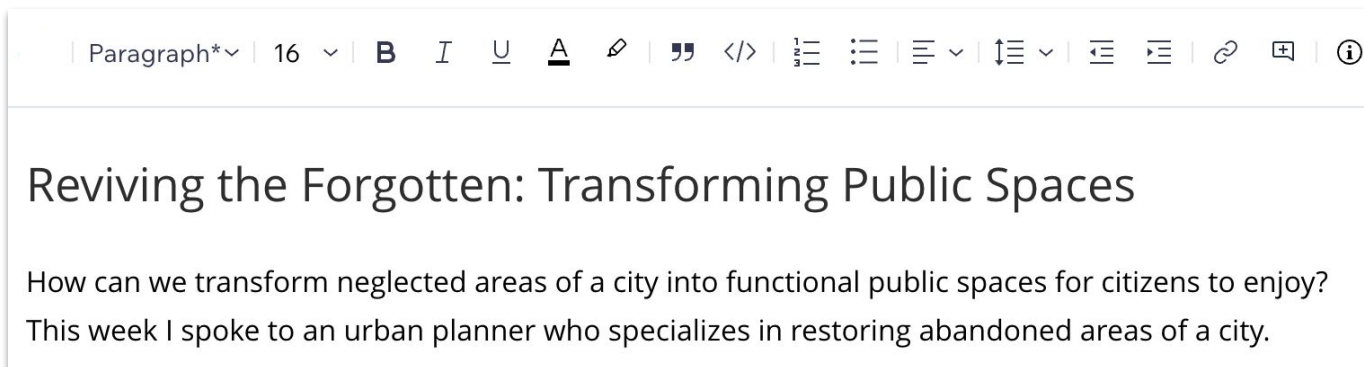


*We uploaded a minute of my project team member's voice, and used that to generate the narration. If he had to narrate 40 pages himself, then maybe we wouldn't have 40 pages. We would've done 20 pages. The AI just cloned his voice. It was eerily similar, it was too good.*



**Project:** An urban design blog featuring voiceover narration to enhance accessibility

**Prompt:** *[Text to Speech]* How can we transform neglected areas of a city into functional public spaces for citizens to enjoy? This week I spoke to an urban planner who specializes in...

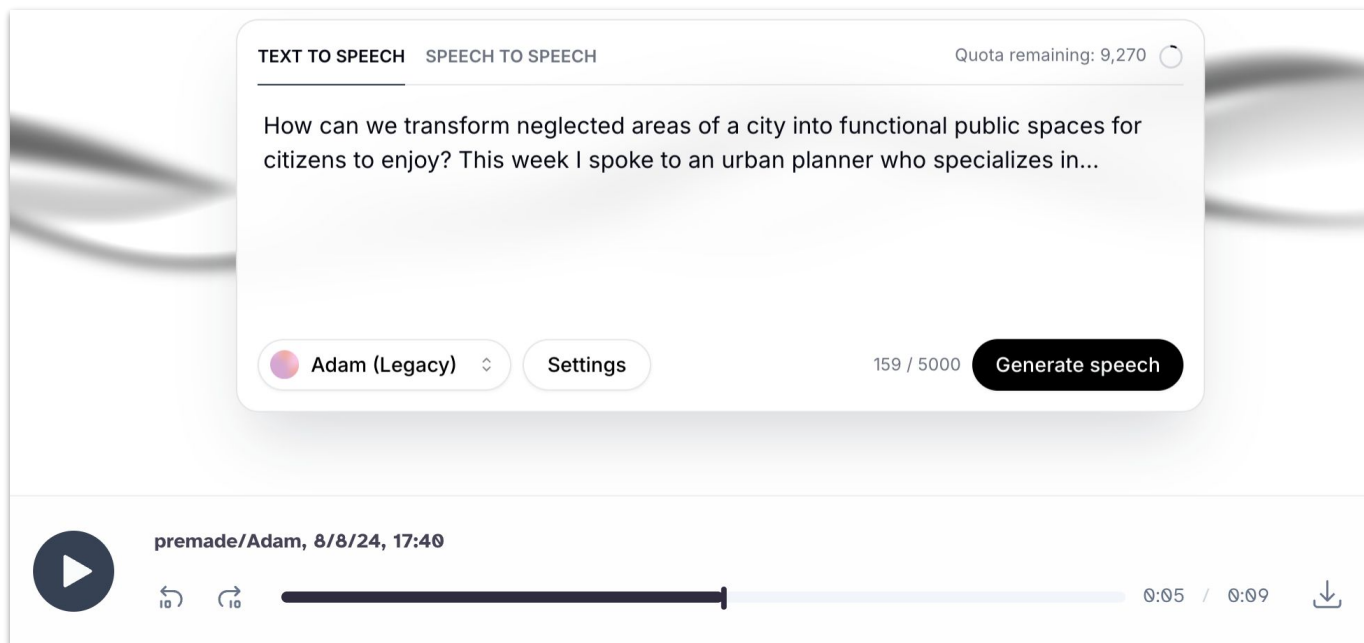


Paragraph\* v | 16 v | **B** *I* U A

## Reviving the Forgotten: Transforming Public Spaces

How can we transform neglected areas of a city into functional public spaces for citizens to enjoy? This week I spoke to an urban planner who specializes in restoring abandoned areas of a city.

*Blog post published with Wix*



TEXT TO SPEECH | SPEECH TO SPEECH | Quota remaining: 9,270

How can we transform neglected areas of a city into functional public spaces for citizens to enjoy? This week I spoke to an urban planner who specializes in...

Adam (Legacy) Settings 159 / 5000 **Generate speech**

premade/Adam, 8/8/24, 17:40

0:05 / 0:09

*Excerpt generated with ElevenLabs*

# DESIGN STYLIST

Offer design recommendations for fonts, colors, and themes

---



*I would ask GenAI, 'Okay, what colors do you think I should use?' Or 'What fonts should I be using on this page?'*



**Project:** An informal, self-paced, language learning app for Gen Z users

**Prompt:** I want to design a cute and colorful app for Gen Z learners. I want the app to be friendly and engaging. Can you suggest a combination of different title and body fonts? What colors should I use, and why?

That sounds like a fun and exciting project! Here are some suggestions for fonts and colors that could resonate well with Gen Z and align with your goal of making the app friendly and engaging:

### **Font Combinations:**

#### 1. **Title Font: "Poppins"**

- **Body Font: "Roboto"**
- **Reason:** Poppins is a geometric sans-serif typeface with a friendly and approachable feel, making it great for titles. Roboto, on the other hand, is modern and highly readable, perfect for longer text blocks and supported on most devices.

### **Color Palette:**

#### 1. **Primary Colors:**

- **Coral (#FF6F61):** A vibrant and lively color that represents energy, enthusiasm, and fun, which can appeal to Gen Z users.
- **Turquoise (#1ABC9C):** A fresh and calm color that balances the vibrancy of coral and adds a sense of tranquility.

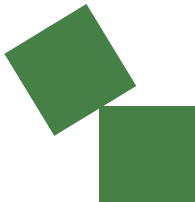
# NAME GENERATOR

Suggest titles for your project

---



*I did use generative AI to help me find my game's title. I didn't end up using any of them, but it came up with some. I was like, 'Okay, these are ones that I can piece together.' I think that when I was feeling stuck on some of the details, that was perhaps helpful.*



**Project:** A board game where children learn about different ecosystems

**Prompt:** I made a children's board game where players choose an animal and a location and make decisions about their environment's design, to learn more about ecosystems. What should I call this game? Give me 10+ titles.

 **Llama3 8b**

What a great project! I'd be delighted to help you come up with some title suggestions for your game. Here are over 10 options to get you started:

1. **EcoQuest:** A playful name that suggests a quest for knowledge and exploration, while also highlighting the eco-friendly aspect.
2. **Design Your Habitat:** This title emphasizes the creative aspect of designing an environment for your chosen animal.
3. **WildWorld Builder:** This name plays off the idea of building and creating a world for your animal, while also emphasizing the "wild" aspect of ecosystems.
4. **Ecosystem Engineers:** This title highlights the idea of players being responsible for designing and managing their own ecosystem.
5. **Adventure Habitat:** This name combines the excitement of adventure with the idea of designing a habitat for your animal.
6. **Creature Care:** This title emphasizes the responsibility of taking care of your chosen animal and its environment.

*Excerpt generated with Harvard Sandbox (Llama3 8b)*

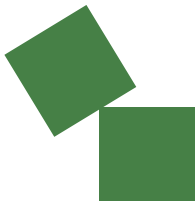
# MULTIPLE INPUTS

Prompt with both text and images

---



*I created kind of an intense AI graphic for the project's branding. I fed Adobe Firefly an image prompt too, just to get a color palette. I'm not inspired just telling it one thing to do. I'm more of a curator of the AI.*

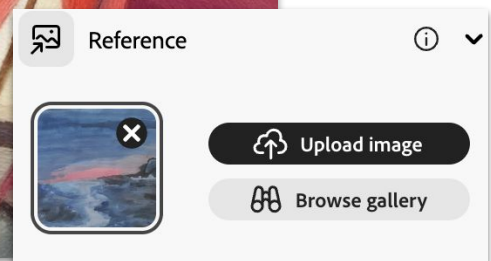
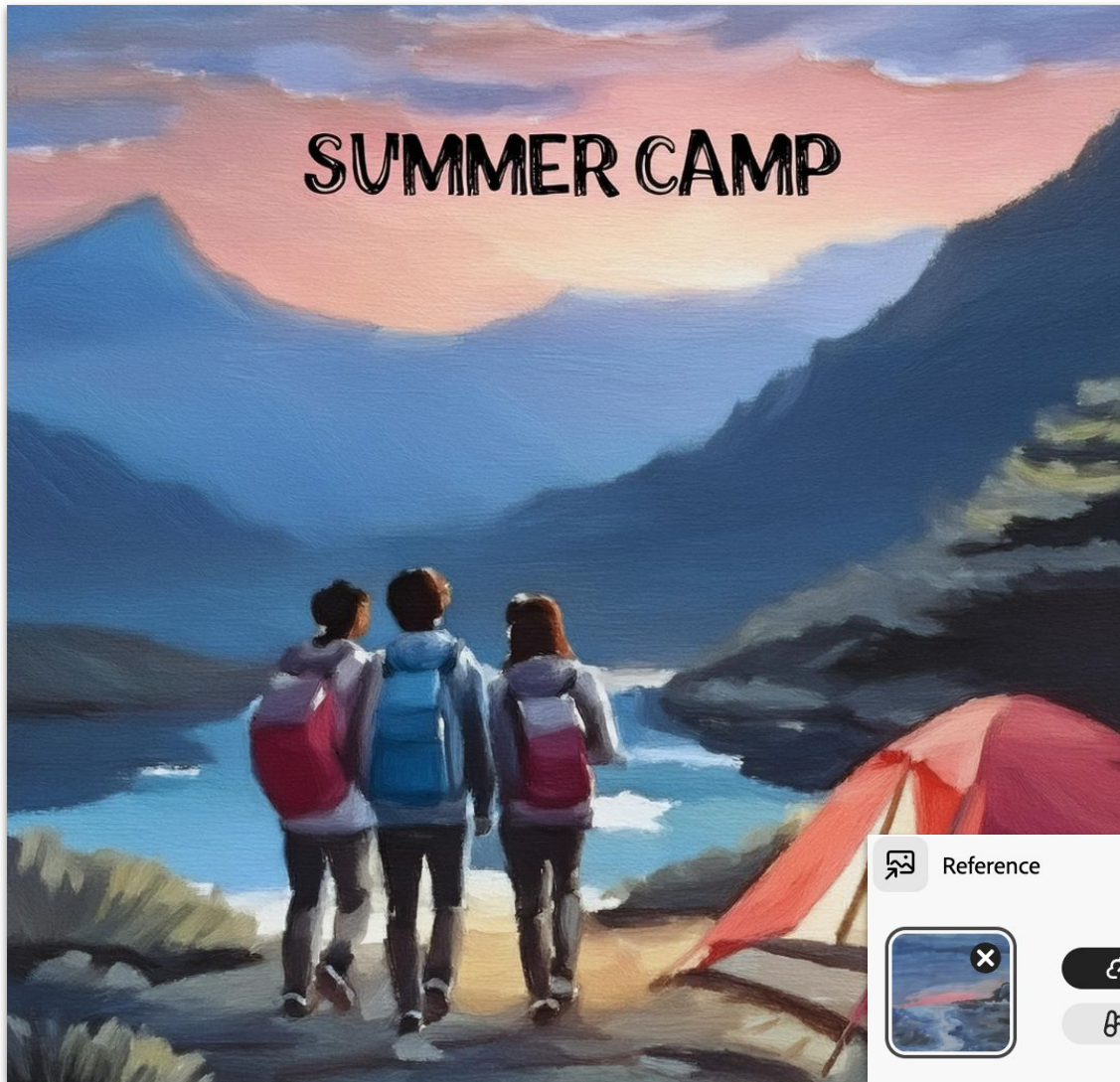




**Project:** Summer camp for teenagers, introducing backpacking and hiking

**Prompts:**

1. *Text:* A poster for a summer camp, teenagers in hiking gear near a campsite
2. *Uploaded style and color reference image:* SunsetRiver.jpg



Excerpt generated with Adobe Firefly

# CODE CRAFTER

Assist in creating code snippets

---



*I am a slower coder than I am a 3D modeler. I know that's one of my weaknesses. I used GenAI to augment that. I knew exactly where the code needed to go. I knew exactly what needed to happen. So, it was really easy for me to ask ChatGPT, 'Hey, make me a code that allows me to switch scenes after 30 seconds.'*



## Project: A 3D treasure hunting game developed with Unity (using C#)

**Prompt:** I'm making a 3D treasure hunting game in Unity. In C#, how do I make an object follow the mouse?



To make the mouse cursor follow the pointer in a Unity game using C#, you can manipulate the position of a game object to align with the mouse cursor's position on the screen. Here's a simple way to achieve this in Unity using C#:

1. **Create a Game Object:** This will be the object that follows the mouse. It could be a sprite or any other visual element.
2. **Add a Script:** Create a new C# script in Unity (you might name it `MouseFollower`) and attach it to the game object you created in step 1.
3. **Script the Mouse Following Behavior:** Use the following example code to make the game object follow the mouse cursor.

```
csharp Copy code

using UnityEngine;

public class MouseFollower : MonoBehaviour
{
    // Update is called once per frame
    void Update()
    {
        FollowMouse();
    }

    private void FollowMouse()
    {
        // Convert the mouse position from screen coordinates to world coordinates
        Vector3 mousePosition = Camera.main.ScreenToWorldPoint(Input.mousePosition);
        mousePosition.z = 0; // Ensure the z position is zero if you're in a 2D game

        // Update the position of the game object to be the same as the mouse
        transform.position = mousePosition;
    }
}
```

*Excerpt generated with ChatGPT 4o*

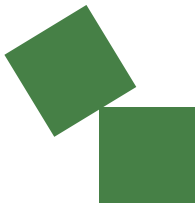
# DECODE YOUR CODE

Interactive code explanations

---



*Sometimes a professor will give us a set of code examples, but he won't have time to walk through everything. I'll put my code into GPT and ask, 'Hey, can you explain what each line of code is doing, and what is its purpose?' And they'll give a pretty good explanation of what the code is meant to do.*



**Project:** A data analysis project about gender using a linear regression model

**Prompt:** What does this line of code mean in R: `mod_lin <- lm(cert ~ female, data = dat)`?



**GPT-4o**

The line of code `mod_lin <- lm(cert ~ female, data = dat)` in R is used to create a linear regression model. Here's a breakdown of each component of the code:

1. **lm():** This is a function in R that stands for "linear model". It is used to fit linear regression models.
2. **cert ~ female:** This is the formula interface inside the `lm` function.
  - `cert` is the dependent (or response) variable. This means you are trying to predict or explain `cert`.
  - `female` is the independent (or predictor) variable. This means you are using `female` to predict or explain `cert`.
  - The `~` symbol signifies a relationship, essentially saying "cert as a function of female."
3. **data = dat:** This specifies the dataset from which the variables should be taken.
  - `data` is an argument specifying the data frame that contains the variables specified in the formula.
  - `dat` is the name of the data frame that contains the columns `cert` and `female`.

So in summary, this line of code creates a linear regression model (`mod_lin`) where `cert` is predicted by `female`, using the data found in the data frame `dat`. The result, `mod_lin`, is an object containing all the details of the fitted model, including coefficients, residuals, and other statistical information.

*Excerpt generated with ChatGPT 4o*

# DEBUGGING ASSISTANT

Identify bugs, explain error messages, and provide alternatives

---



*Sometimes I have a bug in my code and I can't figure it out. I can just plug in my code into GPT and ask, 'Can you figure out the bug in my code?'*



**Project:** An exploratory data analysis project in Python

**Prompt:** What does this error message mean: "Traceback (most recent call last): File "<stdin>", line 1, in <module> TypeError: can only concatenate str (not "int") to str"



The error message you're seeing is a **TypeError**, which occurs when you try to concatenate a string ( `str` ) with an integer ( `int` ). In Python, you cannot directly concatenate different data types like this.

Here's an example that might cause this error:

```
python
```

[Copy code](#)

```
name = "John"  
age = 30  
greeting = name + " is " + age + " years old."
```

In this example, you're trying to concatenate a string ( `"John"` ) with an integer ( `30` ), which raises the error. To fix this, you need to convert the integer to a string before concatenation:

```
python
```

[Copy code](#)

```
greeting = name + " is " + str(age) + " years old."
```

This way, both `name` and `age` are strings, allowing Python to concatenate them without any issues.

*Excerpt generated with ChatGPT 4o*

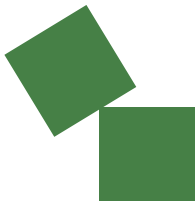
# FORMULA FINDER

Look up spreadsheet functions for data analysis

---



*I used AI to find Excel functions that people on my team and I didn't know. I would say, 'I'm trying to measure how many of row A have this word in it, and how many of row B also have that key term?' I would ask AI to give me an Excel function that I can use in my spreadsheet. Then I wrote down all the formulas for people to replicate, and they found that to be helpful.*





**Project:** A data analysis project in Excel examining workshop attendance

**Prompt:** What Excel function should I use if I want to count the number of times person A appears in columns 1-15?



You can use the `COUNTIF` function in Excel to count the number of times person A appears in columns 1-15. Here's how to set it up:

If the data you are looking at is in columns A to O (which represents columns 1-15 in Excel), you would use the following formula:

excel

Copy code

```
=COUNTIF(A:O, "Person A")
```

This will count how many times "Person A" appears across columns A to O.

*Excerpt generated with ChatGPT 4o*

#### Formula Cheat Sheet - Workshop Assessment Project

Function	Purpose	Syntax	Example
COUNTIF	Counts the number of cells within a range that meet a single condition.	=COUNTIF(range, criteria)	=COUNTIF(A:O, "Cathy") counts how many times Cathy appears in columns A to O.
VLOOKUP	Searches for a value in the first column of a table array and returns a value in the same row from a specified column.	=VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])	=VLOOKUP(A2, B2:D10, 3, FALSE) looks for the value in A2 in the first column of range B2:D10 and returns a value from the third column of the table range, providing an exact match.

*Table created in Google Docs*

# FRIENDLY TRANSLATOR

Learn colloquial phrases and slang in other languages

---



*When talking to my friends from other countries, I use GenAI to figure out how to informally say something with slang. I then verify it on Google Translate.*



**Project:** A graphic novel created by a writer–artist collaboration

**Prompt:** I'm a beginner in learning Hindi. My project partner is a native Hindi speaker from Mumbai. I want to write him a thank you note for his contributions, which especially acknowledges our close friendship. What are a few short, informal phrases in Hindi I can use?



### GPT-4o

That's wonderful that you're learning Hindi and want to express your gratitude! Here are a few short, informal phrases in Hindi that you can use to thank your project partner and acknowledge your friendship and his artistic contributions:

1. **तुम्हारा बहुत-बहुत धन्यवाद!** (Tumhara bahut-bahut dhanyavaad!) - Thank you so much!
2. **तुम्हारी मदद के बिना यह मुमकिन नहीं होता।** (Tumhari madad ke bina yeh mumkin nahi hota.) - This wouldn't have been possible without your help.
3. **तुम्हारी दोस्ती मेरे लिए बहुत मायने रखती है।** (Tumhari dosti mere liye bahut maayne rakhti hai.) - Your friendship means a lot to me.

*Excerpt generated with Harvard AI Sandbox (GPT-4o)*

The screenshot shows the Google Translate interface. On the left, the Hindi text 'तुम्हारा बहुत-बहुत धन्यवाद!' is entered in a text box. Below it, the Hindi text is repeated in a smaller font. On the right, the English translation 'Thank you very much!' is displayed. The interface includes language selection dropdowns for Hindi and English, a 'See dictionary' link, and a 'Send feedback' button at the bottom right.

*Translation verified on Google Translate*

# WRITER'S CHOICE

Selectively incorporate language edits

---



*As a non-native English speaker, I've been told that I'm a good writer, but it takes an excruciatingly long time to write good stuff. GenAI shortened that. I still use my writing. I cherry pick based on GenAI's edits. I was a perfectionist in my writing. And now, especially when it comes to stuff like emails, it just allows me to let that go and be like, 'AI can help me make it better.' Not the best, but better, and more appropriate to that particular task.*



**Project:** Career development fellowship for young emerging artists

**Prompt:** I am launching a fellowship to support young emerging artists, aged 18-30, in New York City. I need to submit a grant proposal with a summary of my idea. Make suggestions about how to revise this paragraph to be clearer:

“This fellowship will support young multimedia artists in being able to create large-scale installations and collaborate with each other and with existing arts institutions in NYC. There is an opportunity here because other fellowships focus on visual or performing artists, but this fellowship will be for interdisciplinary artists...”



**GPT-4o**

Certainly! Here's a revised version of the paragraph for clarity:

"This fellowship aims to support young multimedia artists aged 18-30 in New York City by providing them the resources to create large-scale installations. Additionally, it will foster collaboration both among the artists themselves and with established arts institutions in the city. While other fellowships typically focus on either visual or performing arts, this fellowship is uniquely dedicated to interdisciplinary artists, bridging different artistic mediums to promote innovation and creativity."

*Excerpt generated with Harvard AI Sandbox (GPT-4o)*

This fellowship aims to support young multimedia artists ~~aged 18-30~~ in New York City by **helping them access** ~~providing them the~~ resources to create large-scale installations. Additionally, it will **facilitate** ~~foster~~ collaboration both among ~~the~~ artists themselves and with established arts institutions in the city...

*Text edited in Google Docs*

# REVIEW, REFLECT, REVISE

Reflect on revision suggestions for written work

---



*I will take my essay and put it in GenAI and be like, 'What are the strengths? What are the weaknesses? How, if at all, might it be improved?' I find that really helpful. It will be very honest and tell you 'this connection isn't clear,' and then you can go back and revise.*



**Project:** An education initiative for middle schoolers about sustainable fashion

**Prompt:** Review and edit this executive summary of my project proposal. What are the strengths and weaknesses? Do you think the transitions between paragraphs are smooth? Do you think the idea is clear?



Executive Summary.docx  
Document



Here's a review to your executive summary. I'll also highlight the strengths and weaknesses, the transitions, and the clarity of your idea.

**Strengths:**

1. Clear Target Audience ...

**Weaknesses:**

1. Lack of Supporting Data ...

**Transitions and Flow**

The transitions between paragraphs are smooth, but there's room for improvement. For example: ...

**Suggested Edit: ...**

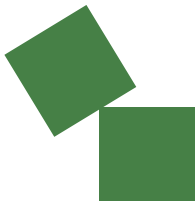
# ASK ANYTHING

Ask bold questions often

---



*ChatGPT is more forgiving about me waking it up and asking questions. If I want to ask a professor something, I want to make sure I don't sound stupid. All of those social constraints holding me back from asking the question the way I want to ask it are gone. ChatGPT has no constraints. You just ask whatever you think.*





## Project: An app that provides tips about mental health and wellness

I talked to my professor about this idea, but she seemed to have a lot of concerns about its social responsibility and authenticity. Is there a risk of perpetuating stereotypes or misinformation about mental health through the app's content? What should I do?



Here are a few things to consider and steps you can take to mitigate these risks:

1. **Ensure Evidence-Based Content:** collaborate with mental health professionals ... ; cite credible sources ...
2. **Avoid Stereotypes:** diversify perspectives ... ; context matters ...

...

When I talked to her, she also kept mentioning user-centered design, what does that really mean?



User-centered design (UCD) is a design philosophy and process in which the needs, preferences, and limitations of end users are given extensive attention at each stage of the design process. UCD can be applied to practically any product, but it's especially relevant in the context of software like your mental health app. Here's what it typically involves: ...

# DEVIL'S ADVOCATE

Provide multiple perspectives to support reflection

---



*The most useful prompt I've ever used on ChatGPT is 'play the devil's advocate.' That has helped so much in anything I do. I would put the situation on ChatGPT, and it would give me something. And then, I would say, 'play the devil's advocate,' and it would give me the opposite perspective.*



**Project:** A short film which portrays a day in the life of an alien

**Prompt:** My movie plot includes subtle clues that the main character is an alien pretending to be a human. One clue is that I'm using a special effect to twist the person's mouth while talking. The idea is that he speaks an alien language, but the audience hears English. Play devil's advocate. What do you think about this?

That's a visually striking idea for a clue! Here are some potential concerns to consider:

1. **Visual Cohesion:** Depending on how it's executed, the mouth-twisting effect could either be highly effective or a bit jarring. If the effect looks too unnatural or distracting, it might pull viewers out of the story rather than adding to the intrigue.
2. **Interpretation and Perception:** Some audience members might not immediately grasp that the mouth-twisting signifies speaking another language. They could interpret it as a glitch, a mistake in editing, or even a comedic element, which might dilute the intended mysterious or eerie atmosphere.
3. **Consistency and Frequency:** If this effect is used consistently whenever the character speaks, it might become too predictable and obvious as a clue. If used sparingly, however, it might not be noticed or its significance might be unclear.
4. **Technical Execution:** Achieving a convincing mouth-twisting effect can be technically challenging and potentially costly, depending on your budget and resources. Poor execution could detract from the film's overall quality.

*Excerpt generated with ChatGPT4o*

# WHAT? SO WHAT? NOW WHAT?

Redefine problems and support reflection

---



*Sometimes you get stuck with your problem. You don't understand your problem and you really need to rethink what you're doing. GenAI challenged me to rethink and define and rephrase my problem until I actually understand it. And I learned a lot about metacognition here. You talk to GenAI, and it gives you ideas about what your problem is.*



**Project:** A game where players listen to a sound and match the sound to the animal

**User** I couldn't figure out how to display a "you are wrong" message when the player clicked on the wrong animal in my game.



**Claude 3 Haiku:**

Here is one way to display a "you are wrong" message when the player clicks the wrong animal in your game: ...

**User** Can I also add a sound to the wrong answer message?



**Claude 3 Haiku:**

Yes, you can definitely add a sound to the "wrong" feedback message. Here are a few ways to do it: ...

**User** Actually, is there a better way to show the wrong answer message, try to be more encouraging?

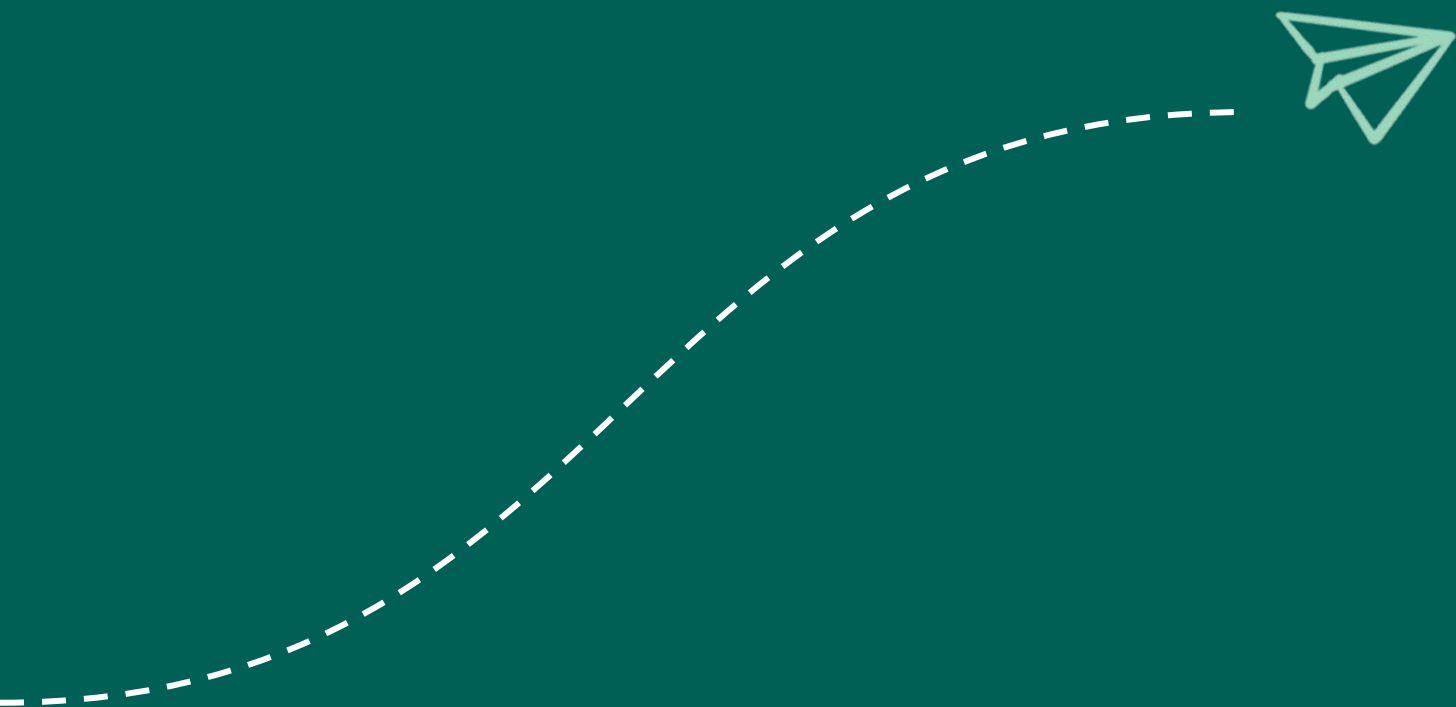


**Claude 3 Haiku:**

Yes, ... Instead of just saying "You are wrong", you could say something like "Almost! Keep trying." or "Not quite, but you'll get it next time!" ...

**User** What are other mechanisms that foster growth mindset in a game like this?

*Excerpt generated with Harvard Sandbox (Claude 3 Haiku)*



**CONTRIBUTORS**

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## FACULTY

David Dockterman  
Tina Grotzer  
Andrew Ho  
Seiji Isotani  
Joe McIntyre  
Louisa Penfold  
Louisa Rosenheck

## STUDENTS

Julia Casey  
Jennifer Chan  
Daria Chuprina  
Adriana Diaz  
Vincent Ferguson  
Luis Gaitan  
Foteini Giannopoulou  
Kayleigh Giles  
Jason Hill  
Shinyi Kang  
Nathalia Kelday  
Vyankatesh Kharagé  
Iwan Kurniawan  
Vivian Li  
Kwan Limbhasut  
Brinleigh Murphy-Reuter  
Heidi Nadhira  
Manabu Nagaoka  
Sriraam Raja  
Michael Schulte  
Veena Senra  
Tarika Seth  
Liam Stanton  
Marco Viera  
Maddi Waskom  
Grace Woodward  
Isminur Yilar

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A variety of texts and research about student-directed learning and about GenAI have helpfully contributed to our thinking. Here is a selection of references for further exploration:

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