

# AI & AR In the Classroom

## Developing the Future of Learning

Jay Rosen

**AI in Education Fair 2025 – UF College of Education**

**Session: AI & AR in the Classroom - Developing the Future of Learning**

**Presenter: Jay Rosen**

Explore the dynamic intersection of Artificial Intelligence and Augmented Reality in K-12 education. This 30-minute breakout session reveals how AI tools are accelerating the development of immersive learning experiences, using the “New Worlds Reading AR Expeditions” game as a live case study. Discover how AI assists in every phase, from brainstorming concepts (with tools like ChatGPT and Miro) and creating assets like concept art and animated 3D models (DALL-E, Luma Labs Genie, Mixamo), and music with SUNO, to programming dynamic AI creature behaviors and ensuring AR elements realistically integrate into the user’s environment.

We will share practical AI strategies and demonstrate adaptable tools for K-12 educators and administrators. Learn how AI assistants like Gemini or Copilot can help draft lesson plans, how image generators create custom visuals, and how AI supports accessibility through translation. Ideal for educators, administrators, and curriculum specialists, this session features an AR game demo and provides actionable insights into leveraging AI for enhanced student engagement and innovative, immersive teaching methods.

# Presenting Today



**Jay Rosen**

*Application Programmer II*  
UF College of Education  
[jayrosen@ufl.edu](mailto:jayrosen@ufl.edu)

Hello, I'm Jay Rosen, an App Developer at the College of Education in the E-Learning, Technology, and Communications Department. Today, I'm going to share how we are transforming literacy education by merging Augmented Reality with Artificial Intelligence, with our new App - New Worlds Reading AR Expeditions, an educational software that creates engaging, immersive experiences for 3rd to 5th graders, by bringing books to life

In this presentation, I'm going to go over

- An Overview of AR & VR in Education, what the future of learning looks like with these new technologies
- We will dive into New Worlds Reading AR Expeditions,
- Go behind the scenes for the app was developed with various AI tools, you can potentially integrate into your own workflow or classroom.
- Depending on the time, I'll share some additional resources for getting more value out of the chatbots - and choosing the right AI for you and your students.

## Augmented Reality (AR)

*Alters* but does not completely replace how you perceive the world around you. It overlays digital information onto your real-world view.

**Immersion:** Partial

**Technology:** Smartphones, tablets, AR glasses.

**Examples:**

- Pokéémon GO
- Amazon's Product Viewer



Augmented Reality is best suited for **contextualization** and **visualization**



## Virtual Reality (VR)

*Replaces* how you see the world around you, creating a simulated environment.

**Immersion:** Total

**Technology:** Head Mounted Displays (Meta Quest, HTC Vive)

**Examples:**

- Beat Saber (rhythm game)
- Meta Horizon (Metaverse)

Virtual Reality is best suited for **simulation** and **experiential immersion**

# AI in Augmented Reality



**Challenge:** Ensuring smooth placement, interaction, and tracking of digital objects in real-world AR environments.

## AI-Enhanced Solutions

- **ARCore & ARKit** provided real-time surface detection and object anchoring for seamless AR integration.
- **Niantic Spatial Platform** enabled advanced spatial mapping and segmentation for immersive experience.



Unity AR Foundation integrates ARCore (Android) and ARKit (iOS) libraries to leverage device hardware for precise plane detection and occlusion. In the interior AR scene (left), a virtual aquarium anchors coral and seaweed to selected planes, providing a dynamic environment for fish to navigate. In the outdoor AR scene (right), a grassy area transforms into an interactive pond, inviting players to fish.

The **Augmented Reality** itself leverages AI for real-time surface detection and object anchoring, making 3D models appear grounded in the user's space with proper lighting and shadows. We used the same Niantic technology that created the game, PokéMon Go, using device specific tools from Apple and Google which were key to achieving this real-world integration.

## AR & VR Benefits

**Accelerated Learning & Confidence**  
VR training can be up to **4x faster** than traditional methods, boosting learner confidence by as much as **275%**. [1]

**275%**

more confident to act on what they learned after training

**4x**

faster than classroom training on average

**4x**

more focused than e-learners

**3.75x**

more emotionally connected to the content than classroom learners

[1] Virtual Speech. "Benefits of VR for Developing Soft Skills". <https://virtualspeech.com/blog/benefits-vr-soft-skills-training>.

According to studies from **Virtual Speech** - AR & VR provide benefits such as

**Boost to Learning:** Learners using VR can be trained up to **4 times faster** than traditional classroom methods and show up to a **275% increase in confidence** to apply the skills learned, according to studies like those conducted by

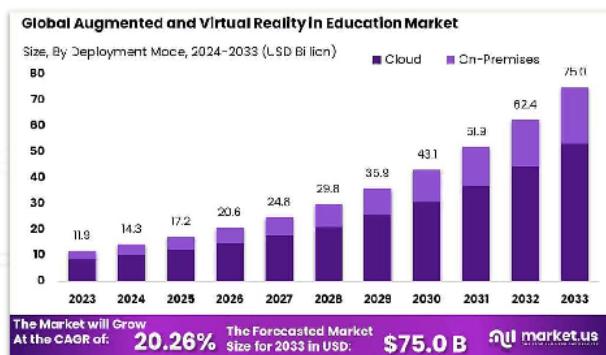
## AR & VR Benefits

### Rapid School Adoption

US K-12 school adoption of AR/VR was projected to surge from <20% in 2022 to over **40% by 2024**. [2]

### Massive Market Growth

The global AR/VR education market is forecast to potentially exceed **USD 65-80 Billion** by the early 2030s. [3]



[2] Mash Youth Development. "Emerging Technologies in Education: Statistics on AI and VR Adoption Rates in 2024". <https://www.mash.co/en/statistics-on-ai-vr-adoption-in-education/>

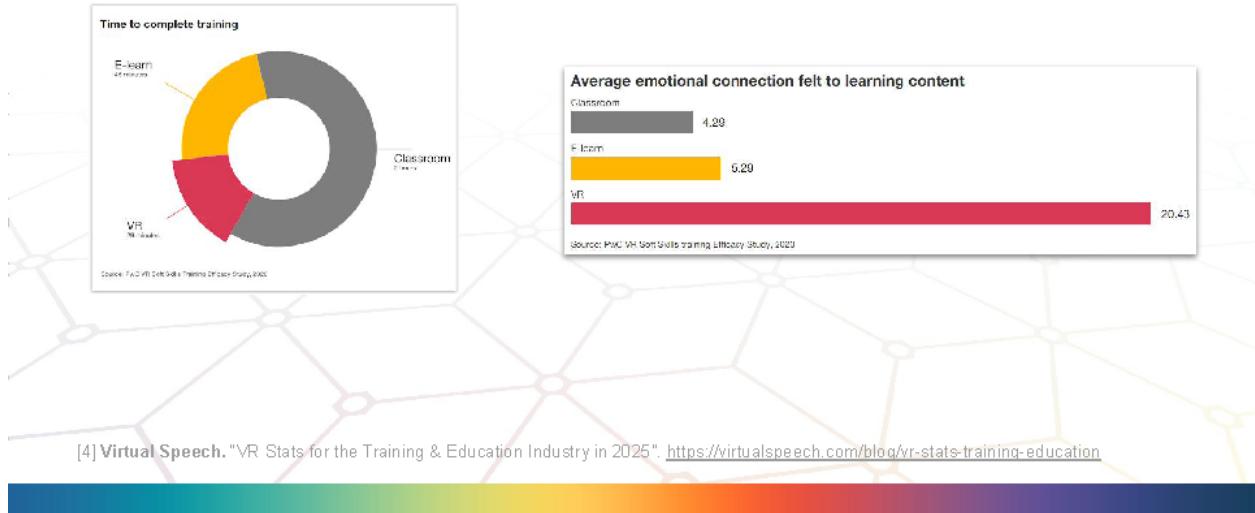
[3] Market US. "AR and VR in Education Market To Hit USD 75 Billion by 2033" <https://scoop.market.us/ar-and-vr-in-education-market-news/>

## Market Research shows growing Massive Market Expansion and Rapid School adoption.

The integration of these technologies is accelerating quickly; for instance, projections indicated that over **40% of K-12 schools in the US** would incorporate AR/VR by 2024, more than doubling the adoption rate from less than 20% in 2022.

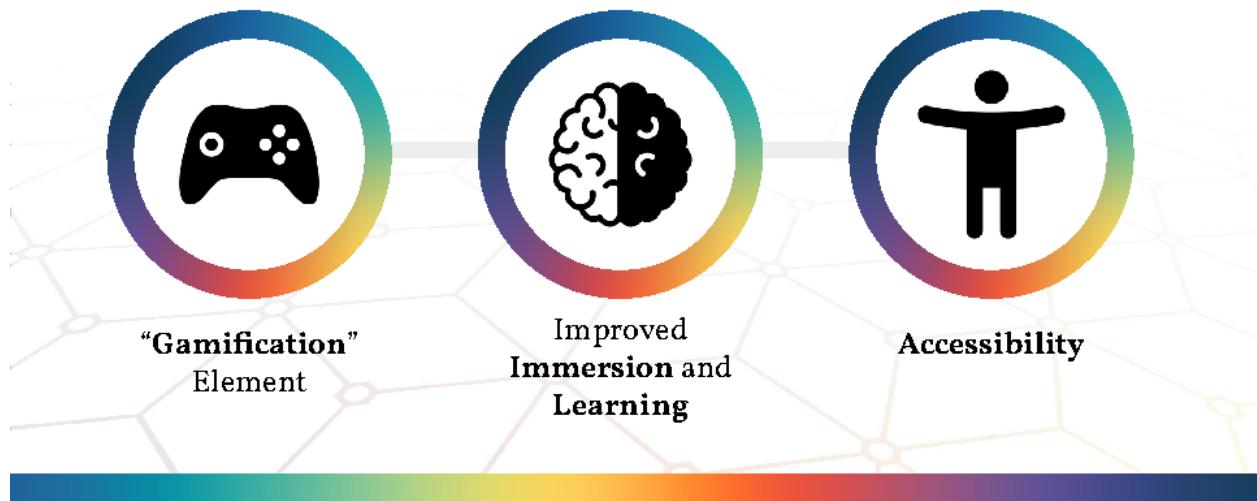
The global AR and VR in the education market is experiencing explosive growth, with forecasts predicting it could reach values ranging from approximately **65 billion to over 80 Billion Dollars** by the early 2030s, showcasing massive investment and expected adoption (exact figures vary by report).

## AR & VR Benefits



Lastly, this study from PWC Soft Skills Training shows that AR/VR training can allow learners to complete training faster. In this study, the training session, VR lesson, took 29 minutes to complete, while E-learning took 45 minutes, and traditional Classroom training took 2 hours. And the learners felt more emotionally connected to the learning content, as you can see in the bar graph on the right - almost 5x more connected, as the content becomes more personal and immersive.

## Why Choose AR/VR in Teaching?



### Why Choose AR or VR in Teaching?

#### There is the Gamification benefit, with enhanced Engagement

- Introduces a "fun element" that can capture and maintain attention, especially crucial for younger learners or complex topics.
- Echoes social situations for younger generation
- Transforms learning from passive consumption to active participation.

#### AR/VR also allows for Deep Immersion & Unique Experiences:

- Provides realistic, repeatable practice for skills in fields like medicine or technical training without real-world risks or high costs.
- Allows for trial-and-error learning in a controlled environment (e.g., surgical simulations, emergency response drills).
- Creates memorable, context-rich learning opportunities that go beyond textbooks or videos.
- Visualizing complex concepts in 3D or interacting directly with subject matter can lead to deeper understanding and better knowledge retention compared to abstract explanations.

**AR/VR is also great for Safe & Cost-Effective Simulation, and can make content more accessible**

- Allows students to experience environments or scenarios otherwise impossible or impractical (e.g., exploring the human body, visiting historical sites, practicing complex procedures).
- Ability to conceptualize abstract principles



# AR Expeditions

{newworldsreading}



EQUITABLE LEARNING  
TECHNOLOGY LAB



E-Learning, Technology  
and Communications



Developmental Research School  
at the University of Florida



Let's dive into New Worlds Reading AR Expeditions, this is a project being developed here at College of Education, that is transforming literacy education by merging Augmented Reality with Artificial Intelligence.

Our team at the E-Learning, Technology, and Communication Department is collaborating with the Lastinger Center for Learning, to build new educational software that creates engaging, immersive experiences with literature for 3rd to 5th graders,

bringing books to life with the magic of Augmented Reality.

This app is tied to the Florida state-wide reading program, The New Worlds Reading Initiative



## About New Worlds Reading Initiative

The New Worlds Reading Initiative is a book distribution program in collaboration with Scholastic, particularly for reluctant and struggling readers.

New Worlds Reading's books and activities support students in:

- Strengthening literacy skills
- Building reading confidence
- Nurturing a lifelong love of reading

 newworldsreading

The New Worlds Reading Initiative program provides free books to elementary students across Florida who are reluctant readers or are struggling to read at grade level.

The Lastinger Center is partnered with Scholastic Books to deliver free books to the homes of these students, so they can read the books with their families.

This program strengthens literacy skills, builds reading confidence, and nurtures a love of reading.

## AR Expeditions: Project Reasoning



### Problem

The NWRI program distributes books to families with struggling readers, but how do we **encourage them to engage** with these books?

### Solution

An app that combines the magic of **augmented reality** with **literary games**, building upon themes of the NWRI books.

With this free reading program comes a new problem - although we can provide free books, it doesn't necessarily mean the books will be read.

How can we motivate and encourage students to engage with these books?

How do we get books to be less perceived as a challenge to kids, and more as a new type of "experience" that is built into a game that can help them feel that learning vocabulary can be exciting and rewarding?

Our solution combines the magic of Augmented Reality with fun games built upon the themes of the books.

## AR Expeditions Overview



Students explore exciting environments, interact with educational content, and foster a love for reading. AR Expeditions builds confidence and motivates children to build a deeper connection to literacy.

**Target Audience :** 3rd - 5th graders

**Platform:** Smartphones and tablets

**Game Engine:** Unity & AR Foundation



Each of the books comes with a QR code, providing free access to download the New Worlds Reading AR Expeditions app for iOS or Android.

Using a phone or tablet, the app uses Augmented Reality to overlay 3D models spatially around you, bringing the book's themes and characters to life. This creates an immersive experience that makes reading feel less like a chore and more like an adventure, **an AR Expedition**, building confidence and motivation to build a deeper connection to literacy.

By blending the digital and physical, it sparks *curiosity*. Imagine reading about the ocean and then seeing a life-size whale swimming above you. That's memorable and makes learning tangible.

To achieve this, we are using the Unity game engine and AR Foundation toolkit, which is essentially the same spatial computing framework that was used to create the popular game, Pokémon Go.



## Ocean Experience



First of four themes, focusing on the aquatic ecology of Florida.



Split into “mini-experiences”:

- Aquarium
- Bubble Pop
- Coloring
- Fishing



The app will feature 4 themed 'Expeditions' based on the topics of the books in the program. Our first expedition, launching this Spring, is the 'Ocean Experience, focusing on the aquatic ecology of Florida. This theme is inspired by books like the Magic School Bus or Who would Win: Whale vs Giant Squid.

We have 4 mini-games in the Ocean Experience - Aquarium, Bubble Pop, Fishing, and Coloring – each utilizing Augmented Reality in different ways.

## Aquarium



Build a live ecosystem in your room, and watch animals interact with each other and their environment.

**AR:** Additive construction.  
Life size animals swim in the space and plants become rooted to the ground plane.



In 'Aquarium' game mode, the students create their own aquatic ecosystem.

They can place different sea creatures and watch them swim, eat, and interact realistically, with these behaviors driven by AI game mechanics.

For example, a small clownfish might eat seaweed, but introduce a shark, and the AI shark will hunt the clownfish, and then the clownfish may try to hide in a sea anemone or form a school of fish with others to evade the shark as a group - this all creates a personal, dynamic learning environment.

Letting children experiment like this turns their world into a playground for learning through curiosity and play.

## Bubble Pop

AR EXP

Pop the bubbles corresponding to correct answers, strengthening your knowledge about Florida ecology.

**AR:** Bubbles and marine life fill the room. Can walk around to see new viewpoints.



In 'Bubble Pop', the student answers questions by popping large bubbles that float in the room, which if correctly, will release the life size 3D character such as the Dolphin. In the game, you would hear the sound effect of the dolphin and can learn more about the animal or item when completing the level.

Since the 3D objects stay in place where they are spawned, you can walk around and see the characters and bubbles from different viewpoints.

There is also a hint system to help teach the word if the student is unfamiliar with the term.

## Coloring



Color in your favorite sea creature, then watch it come to life as a 3D model.

**AR:** Animate the student creations, from 2D to 3D.



The 'Coloring' mini game lets the students fill in a digital coloring book of marine animals and then uses AR to bring their unique creation to life as a 3D animated object in their space. It connects their creativity directly to the AR magic.

## Fishing



Answer vocabulary questions to obtain lures, then use those lures to reel in fish.

**AR:** Transform the ground plane into a fishing pond and walk on the wooden dock.



Our last mini game on this expedition is 'Fishing'.

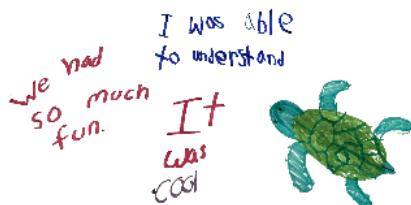
This game mode transforms the floor around you into a fishing dock with a large pond of water.

Here, students answer vocabulary prompts related to the books to earn fishing lures. They can then use these lures to try and catch the fish in the pond.

After completing a vocabulary question, they are also given a Deeper Look to reflect and critically think about that word in their own context.

When a fish is caught it is added to the side of the dock, like displaying a trophy.

## AR Expeditions: Impact

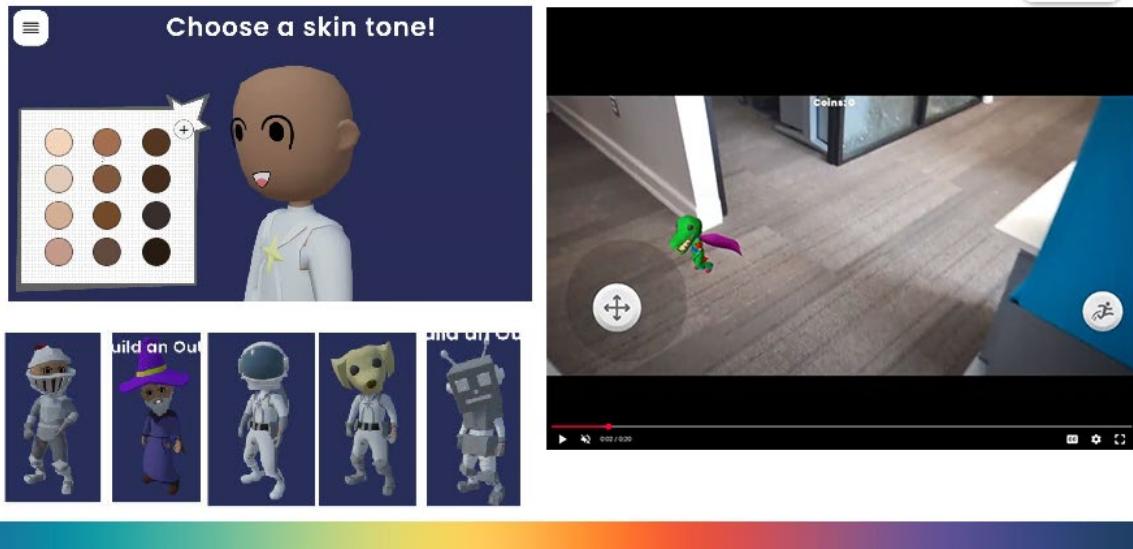


- Ongoing research pilot at P.K. Young Developmental Research School led by doctoral student Irene Kao and supervised by Dr. Nigel Newbutt
- 3rd grade test group found the app **exciting** and **engaging**, helped them **understand** the subject matter of the books
- Publication at *The Society for Information Technology and Teacher Education (SITE)*
  - "From Participants to Designers: Exploring Self-Efficacy through CoDesigning an Augmented Reality Application in a School"
- Forthcoming publication for *IEEE International Conference on Advanced Learning Technologies (ICALT)*
  - "Exploring Elementary Students' Perception and Engagement of Reading using an Augmented Reality Educational Technology Application"

We are currently testing the app with a pilot group of 3<sup>rd</sup> graders at PK Young, with research led by doctoral student Irene Kao and supervised by Dr. Nigel Newbutt. In our preliminary study, the students found the app exciting and engaging and mentioned that it helped them understand the subject matter of the books. The research has been published at the SITE Conference in Orlando and will be part of a forthcoming publication at the IEEE conference in Taiwan in July.

Ultimately, New Worlds Reading AR Expeditions leverages Augmented Reality to tackle the challenge of reading motivation for students who need it most. By creating engaging, immersive, and fun experiences directly linked to the books they receive, we aim to build reading confidence, spark genuine curiosity, and foster a deeper, more positive connection to literacy.

## The Next Expedition



We are now working on the 2nd Expedition - based on Graphic Novels and Comic books. We are developing a superhero builder, where you can customize your own character with different clothing options, headgear, accessories, and even change your skin tone or clothing color to any color you desire. You can even become an Alligator or a Cat with costumes.

This character customization is like games like Roblox, Fortnite, and The Sims, creating your own avatar identity. After creating your character, you will be able to go on your own adventures. In this video showing the current in-development game modes and testing out walking around.

## Co-Design

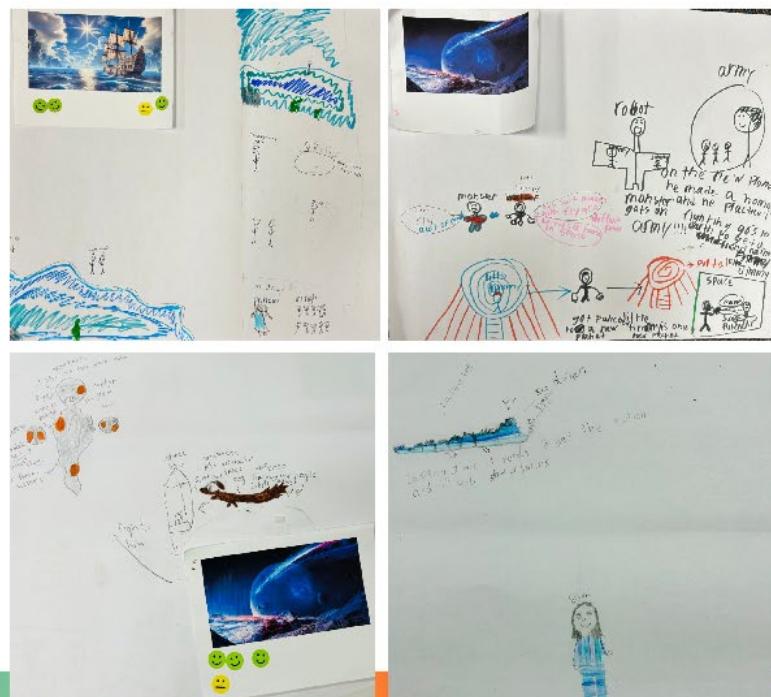


What **setting** are you drawn to? Is there a reason why?



In our Co-Design at PK Young, we are learning from the students what setting they want to explore. We have learned they are interested in the high seas pirate ship, the ice caverns, and the moon as potential locations to explore.

## Co-Design



These are illustrations from the 3rd grade students at PK Young, creating their own superheroes. In the top left is an illustration of a mermaid like character that is exploring

the underwater ocean, on the top right and bottom left is a sci-fi scene on the moon with robot army and Space Dog hero who roams the moon going on adventure. There is also an ice dragon that a student wanted to rescue in the mountains.

**Developing with AI & Augmented Reality for the Classroom**

**New Worlds Reading AR Expeditions**

**Abstract**

**Ideation & Collaboration**

**Concept Art**

**3D Prototypes**

**Audio & Music**

**Game Development**

**Augmented Reality**

**AI Gameplay**

**Multi-Language Support**

**UF EDUCATION**

**E-Learning, Technology and Communications**

**AR EXP**

**new worlds reading**

Earlier this year, I presented this science poster at both the AI Summit in Orlando and the UF Education Research Symposium. I shared how I'm Developing with AI & Augmented Reality for the Classroom in building New Worlds Reading AR Expeditions, which is an educational video game designed to enhance literacy in 3rd- to 5th-grade students through interactive, immersive AR experiences.

By integrating AI tools at every stage of development—from brainstorming and concept art to programming and gameplay—we demonstrate the transformative potential of AI-driven design in educational technologies. AI-enhanced tools powered the rapid generation of creative ideas, streamlined art and music asset creation, automated game scripting, and provided multilingual voiceovers and translations to reach diverse student audiences.

Since creating this poster, there are some newer AI tools I will also share, since this space is constantly evolving.

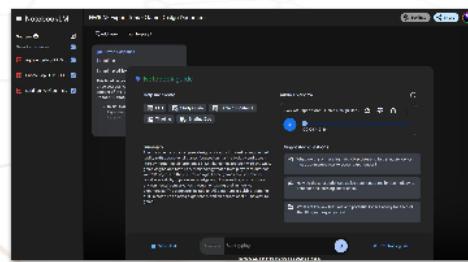
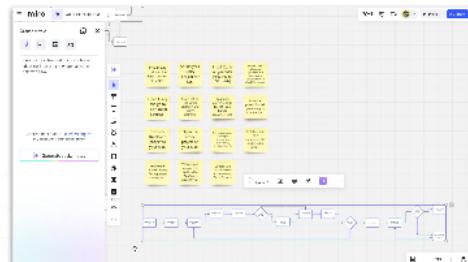
## Brainstorming

miro OpenAI Gemini NotebookLM

**Challenge:** Generating innovative ideas and transforming them into structured game design documents.

### AI-Enhanced Solutions

- Miro AI organized brainstorming sessions more efficiently with AI generated sticky notes.
- ChatGPT expanded rough ideas into well-defined gameplay mechanics, narrative, and design elements.
- Notebook LM (Gemini) compiled game design content into a shared, interactive knowledge base.



For **Ideation & Collaboration**, tools like Miro AI and ChatGPT helped us brainstorm, turning rough ideas into structure game mechanics.

## Generative Art

DALL-E MidJourney Adobe Firefly

**Challenge:** Rapidly producing diverse, high-quality concept art while maintaining design consistency.

### AI-Enhanced Solutions

- DALL-E and MidJourney produced hundreds of art concepts from descriptive prompts, allowing fast exploration of different themes.
- Adobe Firefly polished and refined visuals, removing defects from the AI-generated images.



Even as a trained artist, generating diverse visuals quickly is still tough. AI tools like DALL-E and Midjourney generated hundreds of concept arts. This allowed us to iterate and

visualize how game ideas may appear in Mixed Reality, which is essential for this new type of e-learning software development.

## Generative Art

### Newer AI-Enhanced Solutions

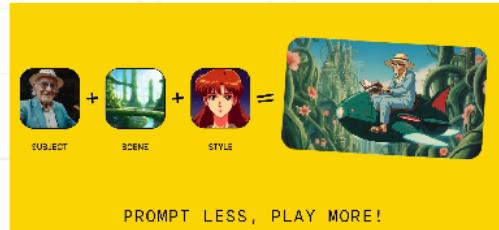
Google Gemini Imagen3 & Whisk provide more control to adjust and modify the AI image by providing Subject, Scene, Style.

Capable of generating video clips from the image.



Imagen 3

Whisk EXPERIMENT



Whisk is a newer AI image generator from Gemini, using Imagen3. Whisk provides more control to adjust and modify the AI image by providing Subject, Scene, Style.

## Generative Art

### Newer AI-Enhanced Solutions

GPT 4o image generation within ChatGPT creating images that retain resemblance and style. Improved letters and graphic logos.

Upload a picture, and request to make it in a different style.

- In the style of Studio Ghibli
- Muppets Style
- As an 80's action figure with accessories



ChatGPT

Of course, there is a big update from ChatGPT 2 months ago, that let everyone turn themselves into Studio Ghibli anime character or Muppets.

This update to ChatGPT 4o omni model integrated image generation directly into it, instead of using Dall-e which is just retained on image and text, the omni model is more capable of thinking, and can produce much higher quality images of different styles.

There is also improved text into images, so you can read the words and create logos.

## Developing Storyboards

Upload a picture of the character as a reference and provide some background about the story. Mention the expected style of art and target audience.

Prompts to create these images in ChatGPT

- Create a 4 panel comic strip of story.
- Create a comic book cover for this story.
- Create an image of this as an AR / Mixed Reality game commercial.



This is how I'm using the latest ChatGPT image generation to help develop our Superhero adventure game. I will use a single chat GPT conversation window describing the general story, and background, and use the image generation to create images based on the story ideas. For example. Upload a picture of the character as a reference and provide some background about the story. Mention the expected style of art and target audience.

Prompts to create these images in ChatGPT

- Create a 4-panel comic strip of story.
- Create a comic book cover for this story.
- Create an image of this as an AR / Mixed Reality game commercial.

## Developing Characters



Upload a picture or image generated by ChatGPT.

Describe what they are wearing, what they are doing, where they are, who they are with.

Extract the character from this image, and place on a white background for a character sheet



To develop characters, upload a picture or image generated by ChatGPT.

Describe what they are wearing, what they are doing, where they are, and who they are with. Extract the character from this image, and place it on a white background for a character sheet

## Audio & Music

**Challenge:** Producing custom audio sound effects, background music, and multilingual voiceovers.

### AI-Enhanced Solutions

- **SUNO and Google Music FX** generated looping instrumental tracks, ambient sounds, and custom music aligned with the game's underwater theme.
- **ElevenLabs** created custom life-like voiceovers for the game narrator.

**SUNO** | ElevenLabs | LABS.GOOGLE

The image contains two screenshots of the SUNO app. The left screenshot shows the 'MusicFX' interface with various sliders for volume, brightness, and tone. The right screenshot shows a generated track titled 'Deep Below' with lyrics like 'Bubbles rise and pop' and 'Underneath the ocean'.

Google Music FX generated instrumental music tailored to specified genres and themeX prompts

SUNO generated compelling audio tracks featuring both instrumental compositions and synthesized vocal performances based on prompts.

Custom **Audio & Music** are vital for immersion. SUNO and Google Music FX generated thematic music tracks, while Eleven Labs provided lifelike narration in both English and Spanish audio. **Multi-Language Support** is crucial for accessibility. We're using tools like Google Translate and Meta M4T to support English, Spanish, and Haitian Creole localizations.

## Music

SUNO generated music soundtracks of various genres developed for the Graphic Novel Expedition.

Each thematic album adds to the immersion of the AR experience and storytelling.

- Synth-Pop
- Ambient EDM
- Renaissance Folk
- Sea Shanty Orchestral
- Super Hero Cinematic



Suno had a major update recently that made it even better at creating music, and mixing genres. These are some examples of the thematic soundtrack albums I'm creating for the hero adventure games, from Synth-Pop and Ambient music in outerspace, to Renaissance Folk on the Ice Dragon Adventure, to Sea shanties while exploring the high seas, and of course cinematic orchestral songs to accompany a superhero movie.

**Thought for 20 seconds >**

Below are ten, single-line Sono prompts you can paste directly into the generator to cover the key moments in your High Seas Pirate Adventure world. Each line is kept friendly, kid-safe, and uses the energy/pixie/whimsical heart-style you share.

#	Game Moment	Sono Prompt
1	Title / Main Menu	sunshiny blooming orchard-tastic, sunny pirate battle & whale melody, hand-drawn piano, little "ye-haw" shouts, bright D-major, seaweed loop
2	Calling the Monkeys	honey-sweet pop-party, 100 BPM, sweetie guitar music, sweetie riffs, seagull & splash FX, dreamy confirmation loop, ready
3	Fighting Pirates & Sea Creatures	upbeat tropical island-fusion, playful brass riffs, 8-bit bubbles, steel-string acoustic, low gravity earth beat, background wah wahs
4	Giant Squid Encounter	cinematic, sedated rock/epic, dramatic, low riffs, tense strings, whimsical brass, minor-to-major triumph loop, kid-friendly bows battle loop
5	Underwater Invasion Alert	lo-fi ambient reef sounds, 50 BPM, airy synth pads, gentle marimba & kalimba pads, bubbly ocean riffs, dreamy harmonics, seashell loop
6	Pirate Ship Crash / Upgrade Menu	lower chiptop shanty, cracked banjo & upright bass, brushed snare drums, subtle clay crackles, cozy 30 BPM, sea background music

Mix and match these prompts as needed—the set will give you a nice world-unified but varied soundtrack! Happy sailing!

**Thought for 6 seconds >**

Here's a full set of single-line Sono prompts—each one designed to loop cleanly and match a different moment in Legend of the Ice Dragon. Copy & fix straight into Sono to generate its background track.

#	Game Moment	Sono Prompt (see link)
1	Title / Main Menu	orchestral folk/epic, snowy mountain vista, lute & recorder melody, soft boy-chant w/ white pencil wind P2, digitized O-modes, loop-ready
2	Oceanworld Exploration (Ice Hobo)	mid-paced adventure march, wavy chimes, celeste, bright bells, light strings, xylophone/wind, 16-bit friendly harp w/ blue, seagull loop
3	Initiated Polar Quest	mid-tempo acoustic lo-fi, sunn guitar, hand drum tap, Rattling Baby Items, winter forest ambient, sales wandering theme, 50 BPM, house-ready
4	Dragon Showdown (Ice Hobo)	epic orchestral drama + chock full frosty timbales, icy keyboards FX, 72 BPM, gallop, minor-to-major w/ bright life, high-energy yet child-safe, seashell loop
5	Dragon's Lair / Safe Village	lo-fi tavern chfl, dunderhead plucks, upright bass, crackling fireplace, soft wifis, relaxed 50 BPM, warm, bubbly wood music
6	Dragon's Lair / Character Design	faraway folk-pops, hammered lo-fi chimes, light harmonica, acoustic guitar strums, cozy evening mixed, 100 BPM, swing, loop-ready

I hope all this will give the whole adventure a cohesive, kid-friendly medieval/fantasy sound while keeping each gameplay context distinct.

This is example of creating the music with ChatGPT - I describe the genre of music and upload some concept art, and it generates prompts that I can use in suno for several songs that tie together to form a soundtrack.

This is Suno, I copy and paste the song style description, and the lyrics if it has that. Next, I'll share the samples of the music generated while going over AI Video.

## AI Video



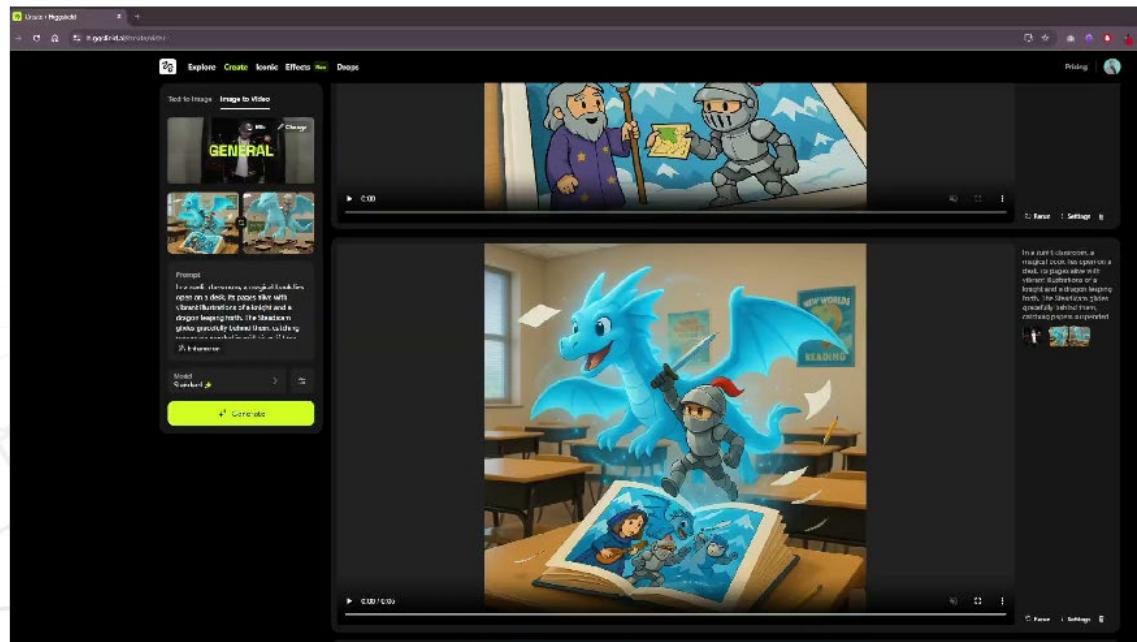
**Challenge:** Generating animations to convey storytelling.

### AI-Enhanced Solutions

- **Higgsfield** creates video clips using a start and end frame. Library of SFX and types of camera shots.
- **Gemini VEO 2** creates video clips from a text prompt (with Gemini Pro), and with Image prompt (with Whisk)



AI videos are also now being explored, with tools like Higgsfield and Gemini Veo. Higgsfield creates video clips using a start and end frame. Library of SFX and types of camera shots. **Gemini VEO 2** creates video clips from a text prompt (with Gemini Pro), and with Image prompt (with Whisk)



This is higgsfield - start end frame, and an example of single image. For start and end frame, it generates all the images in between these sequences and creates its own story.

## Storyboard to Video



This example of taking the concept art images, and creating a fuller sequence, like an animation. Since all the videos generated are only 5-8 seconds long, you piece them together in apps like Adobe Premiere or Clip Champ, or Final Cut.

## AI Video Landscape is Evolving



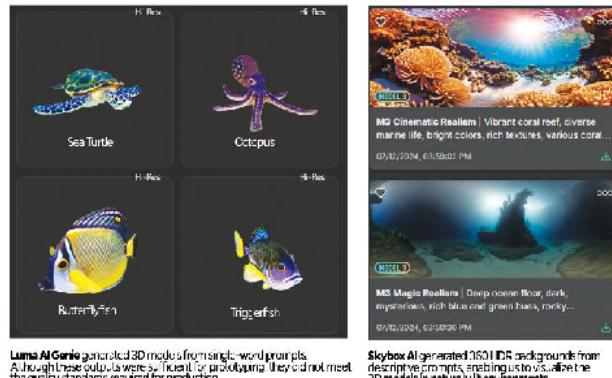
# Prototypes



**Challenge:** Quickly developing interactive prototypes and generating 3D models for early-stage visualization.

## AI-Enhanced Solutions

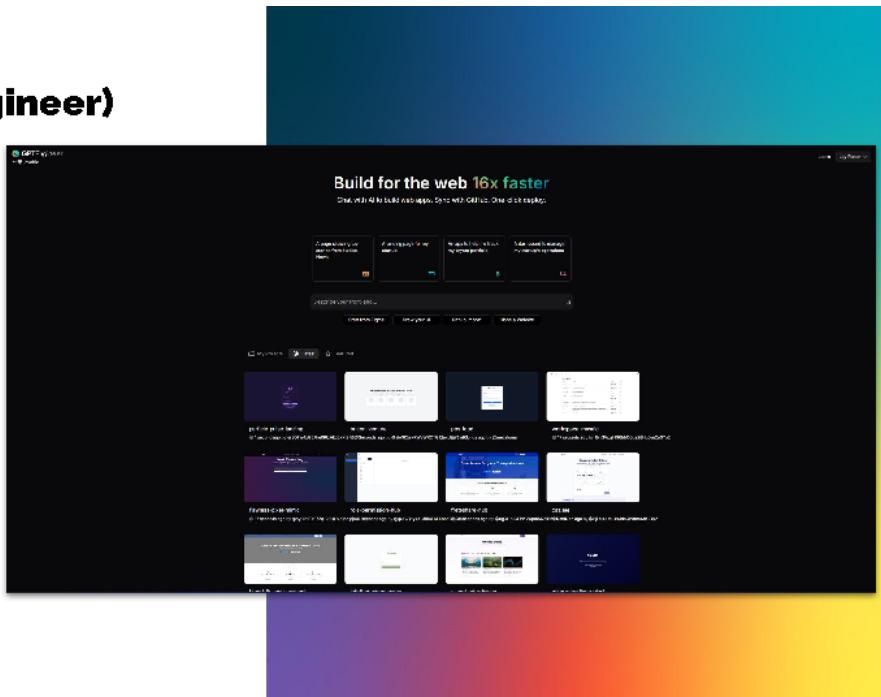
- **Lovable** created functional prototypes for AR demos and research tools with minimal coding.
- **Luma AI** generated NeRF-based, textured 3D models from descriptive prompts.
- **Skybox AI** provided 360-degree HDR backgrounds that simulated underwater game environments.
- **Hugging Face** an exploratory playground for AI apps.



For **3D Prototypes**, creating models and environments can be slow and resource intensive. Loveable enabled rapid prototyping with a No Code Tool, Luma AI Genie generated 3D models from text prompts, and Skybox AI created immersive 360 backgrounds, which was valuable in the early stages of designing our virtual ocean theme game.

## Lovable (GPT Engineer)

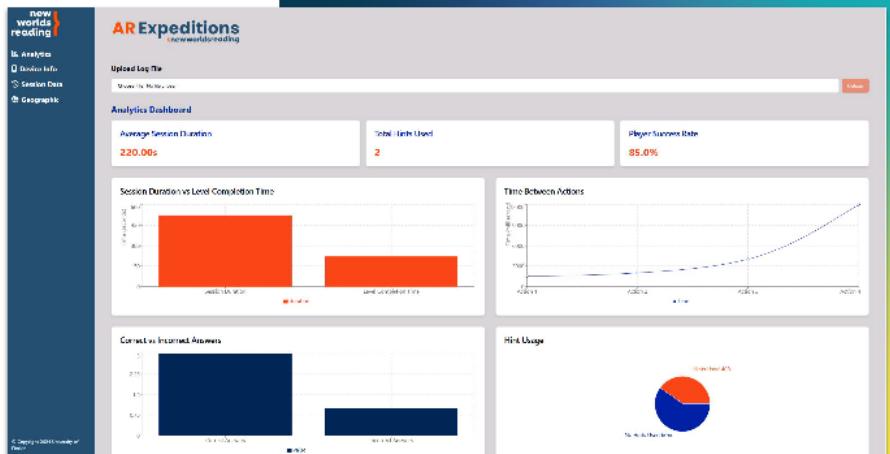
- Free & Paid tier
- Generate an entire app from prompt or image upload
- They host the app and sync to GitHub



<https://gptengineer.app/>

## Lovable - New Worlds Reading

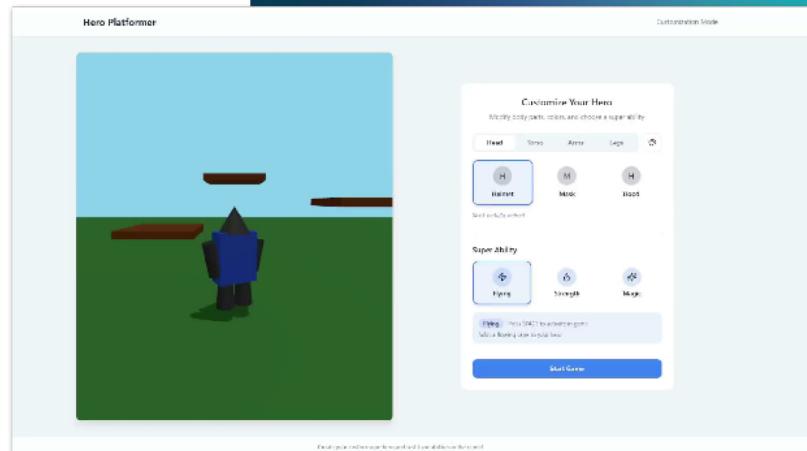
- Built app in a day



<https://nwr-analytics.gptengineer.run/>

## Lovable - Hero Prototype

- Built app in a day



<https://nwr-analytics.gptengineer.run/>

# Game Development



**Challenge:** Developing, debugging, and integrating complex game scripts within the Unity game engine.

## AI-Enhanced Solutions

- **NaviGatorAI (GPT4o)** assisted in generating C# scripts, accelerating the development of gameplay elements.
- **GPT-4 Vision** can interpret screen captures of the game to help debug issues with Unity and scripts.
- **GitHub Copilot** provided real-time code completion and error detection, streamlining the coding process.

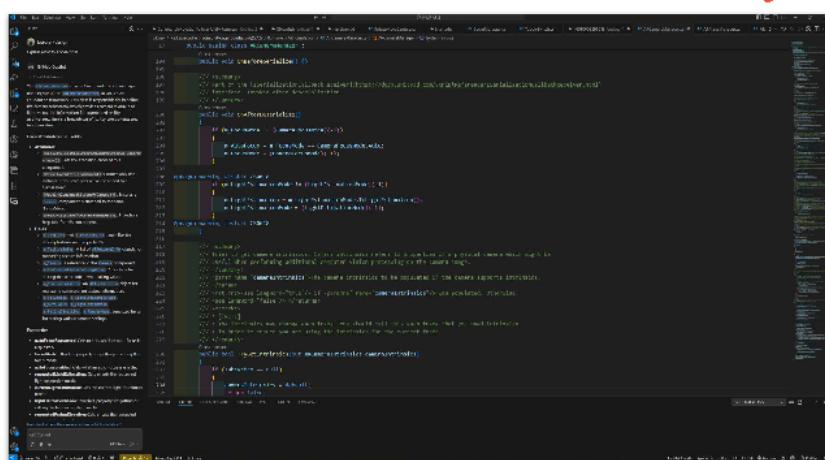


In **Game Development**, coding complexity and debugging are major hurdles. NaviGator AI chatbots from OpenAI and Anthropic Claude and GitHub Copilot assisted with C# code generation and programming, and GPT-4 Vision even helped us visually debug the game within Unity by interpreting screen captures to walkthrough problems and help fix them.

## GitHub Copilot



- GitHub Pro & GitHub Copilot are free for EDU accounts
- Puts GPT 4o directly in Visual Studio Code
- Explain code and help write new code



<https://github.com/features/copilot>

## AI Gameplay



**Challenge:** Designing dynamic, interactive gameplay where AI-controlled characters react to players and environment.

### AI-Enhanced Solutions

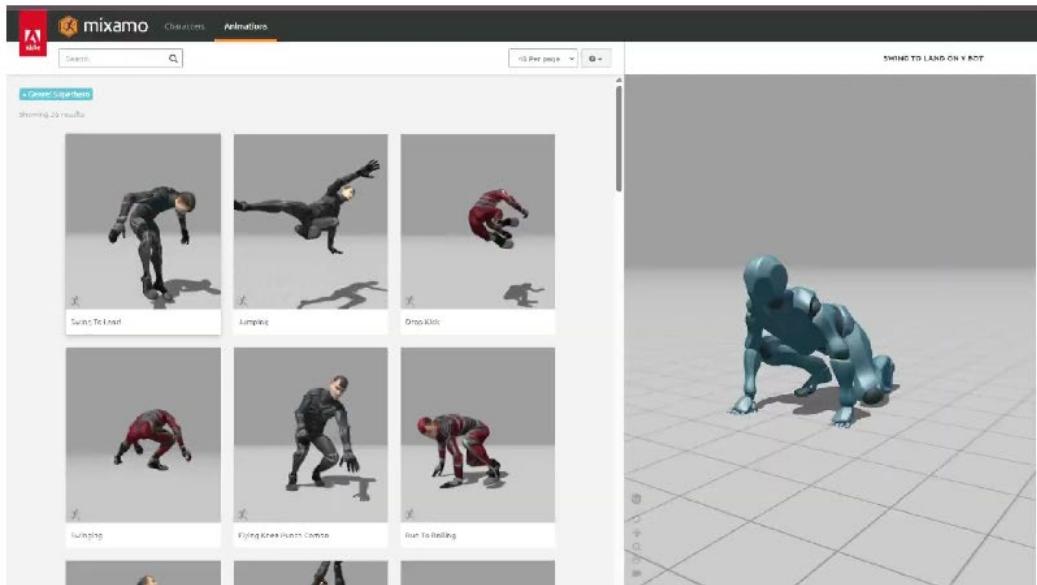
- **Unity ML Agents & OPSIVE Behavior Trees** define decision-making pathways, allowing AI characters to respond to stimuli and adapt to changing in-game conditions.
- **Adobe Mixamo** animates the custom 3D characters from library of animations.
- **LLAMA (exploratory)** is being evaluated for AI-driven conversations to further personalize learning and offer custom challenges.



In this scene captured at the Florida Museum of Natural History, Unity ML Agents' AI-driven behaviors enable marine life to target specific objects—such as preferred foods—and to evade threats like sharks and boats. Each character has its unique motivations, including eating, resting, socializing, swimming, and cooing, which together create a dynamic and evolving ecosystem.

**Our AI Gameplay** uses Unity ML Agents and Behavior Trees allows characters, like fish, to react dynamically to their environment and stimuli. For example, in our aquarium mode, a small clownfish might eat seaweed, but introduce a shark, and the AI dictates that the shark will hunt the clownfish – creating a dynamic mini-ecosystem. Letting children experiment like this turns their world into a playground for learning through curiosity and play

Looking ahead with AI-driven gameplay, I'm exploring the possibility of embedding Meta's **LLAMA3** AI Model directly into the game engine, for personalized AI conversations and procedural challenges based on a student's detected reading level or playstyle. Imagine the game adjusting difficulty or generating new levels tailored specifically to the individual learner. .



This is Adobe Mixamo - adding animations to our characters with AI.

## Multi-Language Support

**Challenge:** Providing accurate translations and interactive voice support without compromising storage or performance.

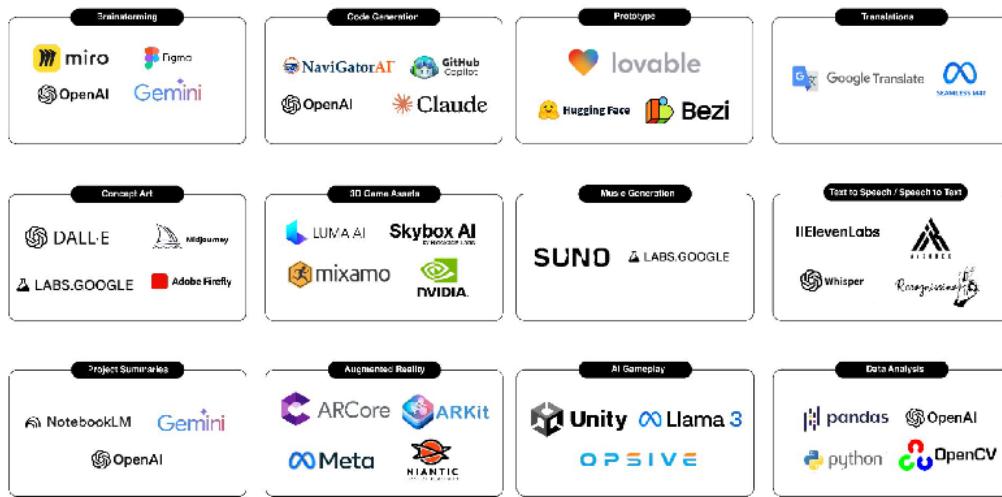
### AI-Enhanced Solutions

- **Google Translate** generated initial text translations, providing a foundation for further linguistic refinement.
- **Meta Seamless M4T** (exploratory) is under evaluation for real-time text and audio translation.



The language selection screen allows players to configure the game's language using Google Translate, exemplified here by the Spanish version of the Bubble Pop game mode.

## AI Tools



This is a breakdown of the AI tools I've been using in my process (February 2025). And already this list is outdated and is missing the AI Video category. (May 2025)



## AI For Your Classroom





### NaviGator Chat Getting Started

A screenshot of the "NaviGator Chat User Guide" landing page. It features a large orange header with the title "NaviGator Chat User Guide" and a "START COURSE" button. To the left is a decorative graphic of a globe and a landscape. Below the header, there's a brief introduction: "This guide is your key to mastering NaviGator Chat, providing access to a variety of advanced AI models from OpenAI, Google, Meta, Claude, and more." Further down, there's a paragraph about the course content: "Topics range from the basics of logging in to advanced subjects such as Prompt Engineering and Custom Instructions, which help you tailor AI outputs to meet your specific needs. Whether you're just getting started or have experience with other Large Language Models (LLMs), this guide will equip you with the knowledge to maximize your use of NaviGator Chat." At the bottom, there's a note: "Dive in and start from the beginning by clicking on 'START COURSE' or select a topic to jump straight to a specific section."

<https://meta.webadmin.ufl.edu/navigator/navigator-chat-user-guide/docs/content/index.html#/>

There is a Navigator Chat user guide available as well, It's at the bottom of the Navigator page - The User Guide goes over how to use the Navigator, different use cases, examples, and also the data policies.

## Data Policies

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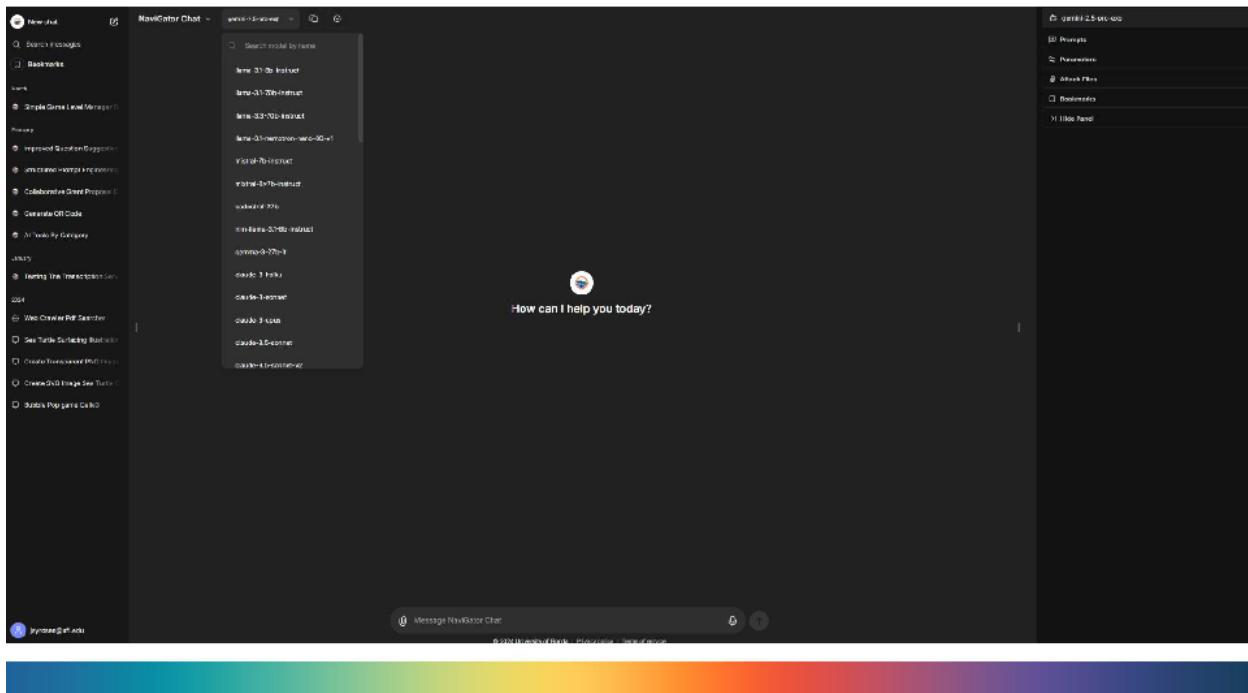
Currently, Navigator Chat is approved for use with OPEN DATA only. It has not yet been approved for use with SENSITIVE or RESTRICTED DATA.

OPEN DATA	SENSITIVE DATA	RESTRICTED DATA
Advertisements	Employee data	Student records
Job postings	Exams	PHI (Protected Health Information)
Published research	Unpublished research	PII (Personally identifiable Information)
UF catalogs	System security plans	Card holder data
UF regulations and policies		Examination and assessment instruments
Press releases		
UF directory		

For more information on data classification, visit [Data Classification Guidelines](#).

Although Navigator Chat is a more secure chatbot environment that is hosted by UF, The Data Policies for Navigator chat approve the use with OPEN DATA only. Navigator chat is not yet approved to use Sensitive or Restricted Data. This policy also applies to using non-UF AI chatbots like ChatGPT and Gemini, so please do not use any Sensitive or Restricted data with AI tools.

Although unpublished research data is listed as sensitive, Navigator and LLMS can absolutely help you with your research.



Here I'm logged into Navigator Chat. To select the AI model, there is a drop down at the top, and on the right sidebar if you have that open. You can search by name or scroll through the list.

## Available Language Models

Language Models and Hosting			
UF HiPerGator	Microsoft Azure	Google	Amazon Web Services
<ul style="list-style-type: none"> <li>■ llama-8.3-70b-instruct</li> <li>■ llama-3.1-9b-instruct</li> <li>■ llama-3.1-70b-instruct</li> <li>■ mistral-email-3.1</li> <li>■ mistral-7b-instruct</li> <li>■ nim-mistral-7b-instruct</li> <li>■ nim-llama-3.1-nemotron-nano-3B-v1</li> <li>■ nim-llama-3.1-6b-instruct</li> <li>■ mistral-6x7b-instruct</li> <li>■ codestral-22b</li> <li>■ granite-3.1-8b</li> <li>■ gomma-3.27b-it</li> <li>■ Stable Diffusion (image generator)</li> </ul>	<ul style="list-style-type: none"> <li>■ gpt-4.1-mini</li> <li>■ gpt-4.1-nano</li> <li>■ gpt-4.1</li> <li>■ v4-mini</li> <li>■ v4-mini-medium</li> <li>■ v4-mini-high</li> <li>■ v3-mini</li> <li>■ v3-mini-medium</li> <li>■ v3-mini-high</li> <li>■ v4-mini</li> <li>■ gpt-4c</li> <li>■ gpt-4c-mini</li> <li>■ gpt-3.5-turbo</li> <li>■ DALL-E 3 (image generator)</li> </ul>	<ul style="list-style-type: none"> <li>■ gemini-2.5-pro-exp</li> <li>■ gemini-2.5-flash-exp</li> <li>■ gemini-2.0-flash</li> <li>■ gemini-1.5-flash</li> <li>■ gemini-1.5-pro</li> </ul>	<ul style="list-style-type: none"> <li>■ command-r-plus</li> <li>■ command-r</li> <li>■ claude-3.7-sommet</li> <li>■ claude-3.5-sommet-v2</li> <li>■ claudio-3.5-sommet</li> <li>■ claudie-3.5-haiku</li> <li>■ claudio-3-haiku</li> <li>■ claude-3-sommet</li> <li>■ claude-3-epus</li> <li>■ mistral-large</li> <li>■ nova-micro</li> <li>■ nova-liso</li> <li>■ nova-pro</li> </ul>



These are the current LLMS hosted on Navigator, including open source models running on HiPerGator, the OpenAI ChatGPT and Dall-e Image Generator running on Microsoft Azure,

the Google Gemini models, and the AWS Claude models. Each LLM does have different characteristics since they are trained on different data sets, so I will try to go over some of the more useful LLMs of the bunch.

At this time, these LLMs do not search online, compared to if you purchased the premium model of like Gemini or ChatGPT - however, that feature might come in a future update.

## Which AI is best?

### Chatbot Arena LLM Leaderboard

Crowd-sourced AI benchmarking platform where users rank AI models.

Rank# (WS)	Rank (StyleCtrl)	Model	Arena Score	95% CI	Votes	Organization	License
1	1	Gemini-2.5e-Pro-Preview-05.06	1446	+8/-9	4568	Google	Proprietary
2	3	oAI-2025-04-16	1413	+8/-7	6689	OpenAIT	Proprietary
2	3	ChatGPT-4u-Talent-(2025-03-26)	1400	+6/-6	10298	OpenAIT	Proprietary
3	5	Oskok_3_Preview_02_24	1403	+4/-4	14843	xAI	Proprietary
4	3	QPT 4.5 Preview	1398	+4/-5	15275	OpenAIT	Proprietary
4	5	Gemini-2.5-Flash-Preview-04.17	1394	+7/-7	5959	Google	Proprietary
7	5	DeepSeek-WI-0024	1373	+7/-5	8753	DeepSeek	MIT
7	5	QPT 4.1-2025-04-14	1366	+7/-8	5182	OpenAI	Proprietary
8	8	DeepSeek-WI	1358	+4/-4	18493	DeepSeek	MIT
8	15	Gemini-2.0-Linux-061	1355	+4/-3	24913	Google	Proprietary
8	13	Baumani-Turbo-20250416	1355	+9/-10	3699	Tencent	Proprietary
8	5	o4-mini-2025-04-16	1351	+10/-7	5003	OpenAIT	Proprietary
10	8	o1_2024_12_17	1358	+4/-4	29836	OpenAIT	Proprietary
10	14	Owen3-235H-X220	1343	+11/-9	3671	Alibaba	Apache 2.0
12	15	Gemma_3_27B_it	1341	+5/-4	12343	Google	Gemma
12	15	Owen2.5_Max	1341	+4/-3	23108	Alibaba	Proprietary
14	13	oAI_preview	1335	+3/-3	33171	OpenAI	Proprietary

<https://larena.ai/>

So, with all these AI models - which AI is best?

It's a difficult answer, since each AI is trained on different data.

You can look at the Chatbot Arena LLM Leaderboard, which is crowd-sourced AI benchmarking for each of the models in tasks such as writing, math, coding, creative writing, and more criteria.

The AI LLM landscape is constantly changing, just this past month, all the top 10 models have been completely re-arranged with new releases.

## Which AI is best?

Total Models: 235, Total Votes: 2,910,528, Last updated: 2023-05-11.

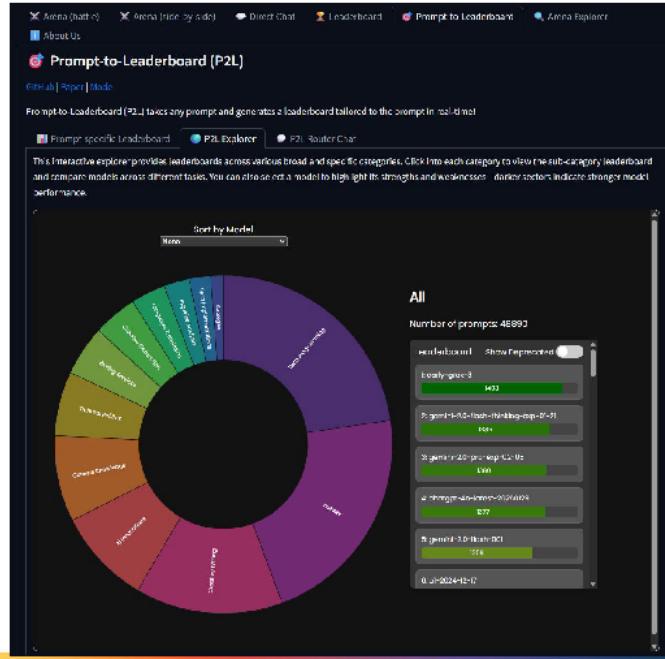
The table displays a heatmap ranking of AI models based on their performance across various tasks. The columns represent tasks: Overall, Overall w/ Style Control, Hand Prompts, Hard Prompts w/ style Control, Coding, Math, Creative writing, Instruction Following, Longer Query, and Multi-Turn. The rows list specific AI models, each with a unique ID and a color-coded rank from 1 (yellow) to 10 (dark blue).

Model	Overall	Overall w/ Style Control	Hand Prompts	Hard Prompts w/ style Control	Coding	Math	Creative writing	Instruction Following	Longer Query	Multi-Turn
	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank
gptini-2.5-preview-06	1	1	1	1	1	1	1	1	1	1
o3-2023-04-16	2	1	2	1	1	1	5	2	5	3
chatgpt-4-tuned-2025-02-16	3	3	3	3	2	5	3	3	3	1
gptk-3-preview-02-24	3	5	2	4	2	4	2	2	2	3
gpt-4.5-preview-2025-02-27	4	3	3	3	3	2	2	2	2	2
gptini-2.5-flash-preview-04-17	4	5	2	3	2	2	2	2	2	4
deepseek-v3-0324	7	5	6	3	3	5	4	7	5	3
gpt-4.1-2025-04-14	7	5	6	3	7	9	5	7	2	4
deepseek-v1	8	8	8	4	8	3	7	7	8	9
gptini-2.0-flash-001	8	15	8	19	8	11	7	11	8	16
BingYuan-TurboX-2025-04-16	8	13	6	7	8	5	6	7	4	4
o4-mini-2025-04-16	9	5	7	3	7	1	13	10	11	0
o1-2024-12-17	10	8	7	5	8	4	7	7	6	11
quant4-202b-s22b	10	14	7	13	5	2	14	16	7	11

<https://lmarena.ai/>

## Best AI for the Task

Prompt to Leaderboard showcases AI model performance in specific categories and each topic can be drilled down further.



<https://lmarena.ai/>

Prompt to Leaderboard is another way to analyze which AI Model performs specifically well at a type of category. Each of these categories and topics can be drilled down further, where you do see certain AI models perform better or worse - which could help you if you choose the right AI model for the type of tasks or research you want to complete.

## Comparison of NaviGator LLMs Pricing and Capabilities

Model (Provider)	Training Data Cutoff	Context Window (tokens)	Max Output Length (tokens)	Input Price / 1M Tokens	Output Price / 1M Tokens
GPT-4o (OpenAI)	October 2023	128,000	4,096	\$2.50	\$10.00
o4-mini-high (OpenAI)	May 2024	200,000	100,000	\$1.10	\$4.40
GPT-4.1 (OpenAI)	June 2024	Up to 1,000,000+	32,768	\$2.00	\$8.00
Gemini 2.5 Pro (Google)	April 2025	Up to 1,000,000+	8,192	\$1.25	\$15.00
Claude 3.5 Sonnet (Anthropic)	April 2024	200,000	8,192	\$3.00	\$10.50
Claude 3.7 Sonnet (Anthropic)	November 2024	200,000	64,000	\$3.00	\$15.00
Llama 3.1 70B Instruct (Meta)	March 2024	131,072	8,192	\$0.10	\$0.28
Codestral-22b (Mistral AI)	January 2025	256,000	32,000	\$1.00	\$3.00

This table provides a comparison of various AI language models based on their training data cutoff, context window size, maximum output length, and token pricing.

The Training Data Cutoff indicates how current the knowledge is, so if you try to ask questions relating to an event after 2024, it might not be able to provide an accurate response.

Context window or tokens is the maximum number of tokens or words the model can process at once, affecting how much information it can consider in a single prompt. This is essentially the amount of memory that the AI can hold with the context of the single conversation. If you have ever used a chatbot and had a long conversation where you had trained it on documents, and it was responding great to a point where it seems to have forgotten the basic info - it's because it has gone past its maximum context window. The models with the highest Context window are Gemini 1.5 pro with 2 million tokens, and Gemini 1.5 flash with 1 million tokens. The newer ChatGPT O3 mini and Claude Sonnet are about double the context window compared to the other models.

The Max Output length is the longest possible response the model can generate in a single output. This is great if you need a fully articulated long response - which you can get with

the ChatGPT o3-mini, of about 100,000 tokens which is roughly 200-300 pages of a book or about 2,000 lines of code for a python program. Compared to the 16,000 tokens output of GPT 4o which is about 40-page book or just 300 lines of code.

For pricing, you can also see the cost efficiency of these different models, so using GPT 4o will cost about \$5 for every 1 million tokens of input as training, and cost \$15 for every 1 million tokens generated.

Since the university is covering the cost of these models,

For Largest context window and deep research - use Gemini 1.5 pro or Claude 3.5 sonnet

For balance of speed, reasoning, and accuracy - use GPT 4o

For working with code, large datasets, or long documents - use o3-mini or the o1-mini



For Largest context window and deep research, working with code, large datasets, or long documents - use Gemini 2.5 Pro or GPT-4.1

For balance of speed, reasoning, and accuracy - use GPT 4o or Claude 3.7

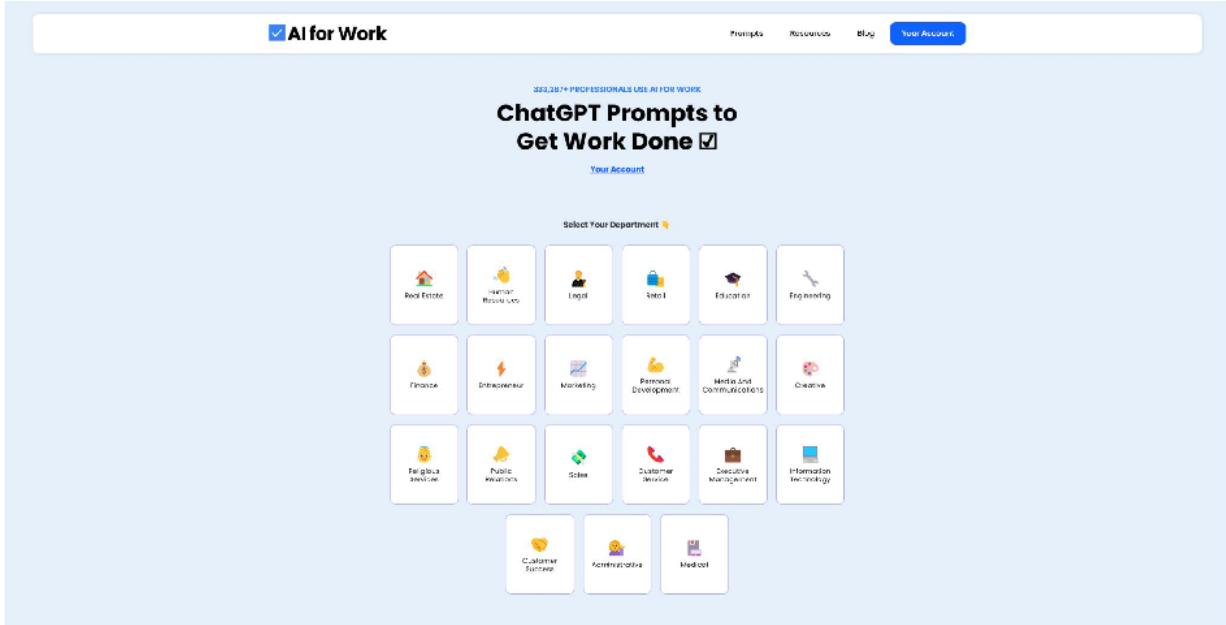
For lower cost open-source, use LLama or Codestral



For Largest context window and deep research - use Gemini 1.5 pro or Claude 3.5 sonnet

For balance of speed, reasoning, and accuracy - use GPT 4o

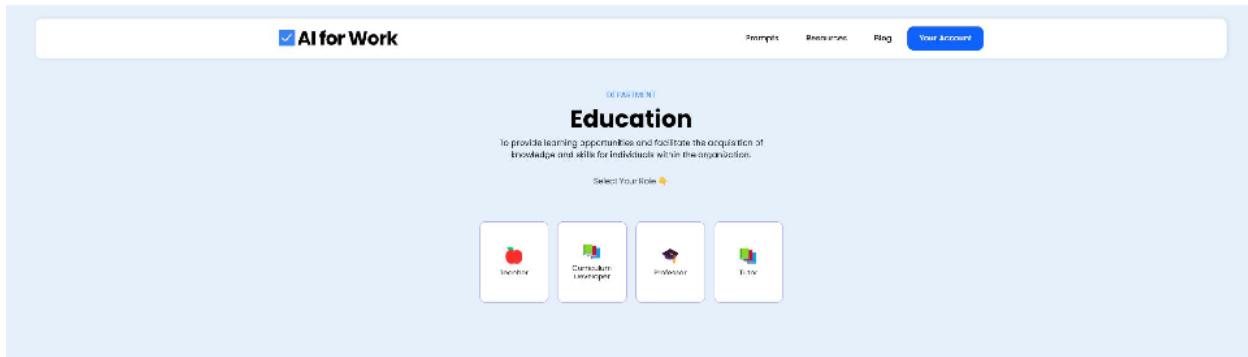
For working with code, large datasets, or long documents - use o3-mini or the o1-mini



<https://www.aiforwork.co/>

AI For Work is a Prompt Generating website that can help you to help you find a persona, and provides you with starter prompts to help you complete your task or think about how AI can be used in your field.

From the AI for Work homepage, we see a bunch of different careers. I'm going to select Education.



<https://www.aiforwork.co/>

Under Education, it narrows down to different roles. For this example I'm going to select Professor.

The screenshot shows the AI for Work interface with the 'Professor' role selected. At the top, there's a navigation bar with 'HOME', 'RESOURCES', 'BLOG', and 'YOUR ACCOUNT'. Below the navigation, the word 'PROFESSOR' is prominently displayed in large, bold letters. A sub-header 'Select a prompt' with a yellow star icon follows. The main content area is a vertical list of ten document creation options, each with a small icon and a descriptive title:

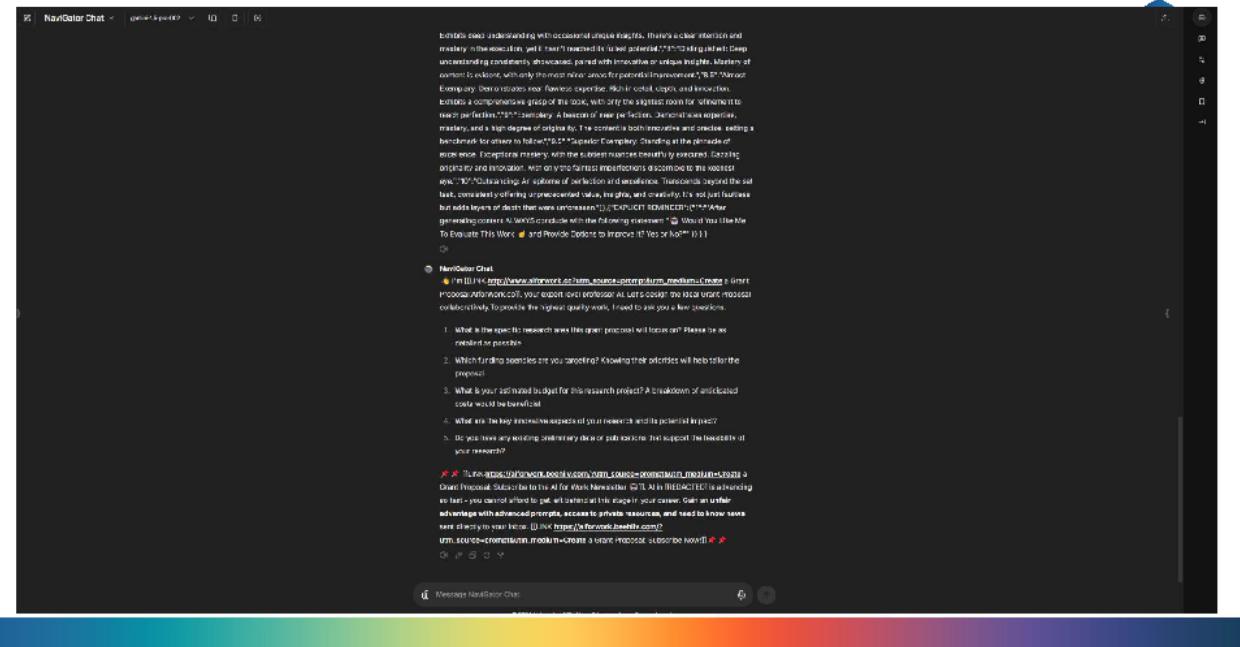
- CONSULT AN EXPERT PROFESSOR
- CREATE A GRANT PROPOSAL
- CREATE A STUDENT PROGRESS REPORT
- CREATE A COMMITTEE REPORT
- CREATE A CONFERENCE ABSTRACTS DOCUMENT
- CREATE A CONFERENCE PRESENTATION DOCUMENT
- CREATE A BOOK REVIEW DOCUMENT
- CREATE A COURSE ASSIGNMENTS DOCUMENT
- CREATE A CURRICULUM DEVELOPMENT DOCUMENT
- CREATE A CLASSROOM MANAGEMENT DOCUMENT

Under Professor, we now see simple prompt starters that give us idea of how we can use AI to accomplish a task such as Creating a Grant Proposal or creating a conference Abstract Document.

<https://www.aiforwork.co/>

When you select one of the starter prompts, you will see a much larger prompt that you can copy and paste into the Navigator or ChatGPT.

## Persona Pattern



So here I am back in Navigator, and I passed the prompt. You will notice that the Navigator understands the pre-written prompt and introduces itself as the expert professor at grant writing. It then gives you list of 5 questions to fill out to gather more context and understanding about your specific request - such as what is the specific research area for the grant proposal, which funding agencies are you targeting, what is the estimated budget, what are the key innovative aspects of the research and potential impact, and do you have any preliminary data or publications to support the feasibility.

As you provide additional context for the AI for work bot, it is programmed to ask more questions to refine its output, even using a rubric to grade its own output to improve the outcome.

So even if you can't come up with an advanced prompt yourself, you can easily copy and paste one of the AI for Work prompts to get you started and have the AI help guide you in providing the context for it to work more effectively.

## CO-STAR Framework

The CO-STAR Framework is a structured approach for creating effective prompts. The more of these you incorporate, the better your results.

**Context:** Providing background information helps the LLM understand the specific scenario.

**Objective:** Clearly defining the task directs the LLM's focus.

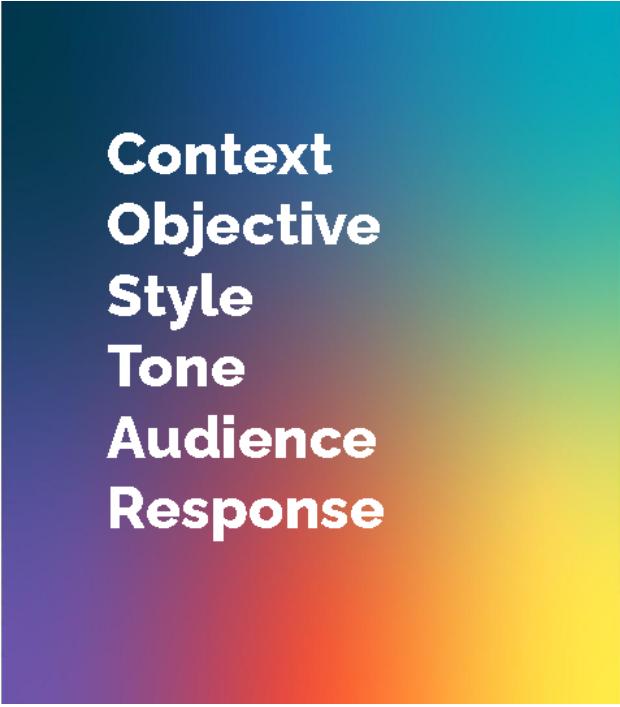
**Style:** Specifying the desired writing style aligns the LLM response.

**Tone:** Setting the tone ensures the response resonates with the required sentiment.

**Audience:** Identifying the intended audience tailors the LLM's response to be targeted to an audience.

**Response:** Providing the response format, like text or json, ensures the LLM outputs, and help build pipelines.

<https://library.westpoint.edu/GenAI/prompting>



Context  
Objective  
Style  
Tone  
Audience  
Response

## CO-STAR Example

**Context:** At UF College of Education, faculty and staff are actively exploring ways to enhance learning experiences by integrating digital learning tools into traditional classroom settings. Recent initiatives have highlighted the need for innovative strategies to engage students and improve educational outcomes.

**Objective:** Develop a list of actionable and innovative strategies that blend digital learning technologies with traditional classroom instruction to boost student engagement and learning effectiveness.

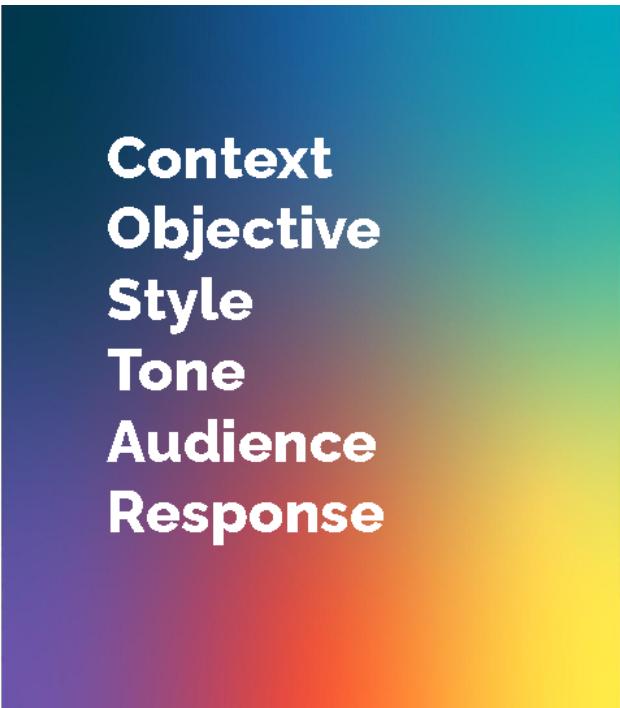
**Style:** Compose the response in an academic yet accessible manner, using clear bullet points and concise explanations to ensure the ideas are easy for busy educators to review and implement.

**Tone:** Maintain a supportive and motivational tone that acknowledges the challenges of integrating new technologies while encouraging proactive experimentation and collaboration.

**Audience:** The response should be directed to UF College of Education faculty and staff, particularly those involved in curriculum development and educational technology integration.

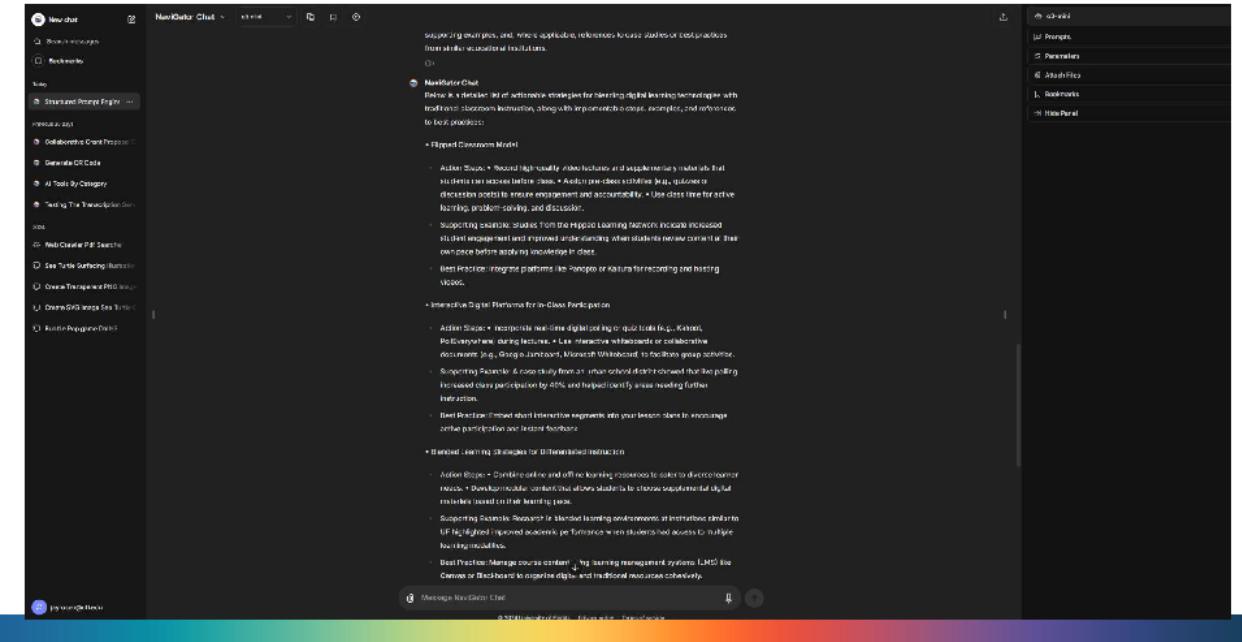
**Response:** Please provide a detailed list of strategies complete with actionable steps, supporting examples, and, where applicable, references to case studies or best practices from similar educational institutions.

<https://library.westpoint.edu/GenAI/prompting>



Context  
Objective  
Style  
Tone  
Audience  
Response

# CO-STAR



Example of using Co-Star prompt engineering framework.

# AR Expeditions

*newworldsreading*

*We had  
so much  
fun.* Thank you!



EQUITABLE LEARNING  
TECHNOLOGY LAB



E-Learning, Technology  
and Communications



Developmental Research School  
of the University of Florida

**UF** COLLEGE OF EDUCATION

**UF** Lastinger Center for Learning  
UNIVERSITY of FLORIDA

So, while AR may have started with catching Pokémon or the occasional Zoom filter mishap, today, we're using it to catch something even more important for kids' attention and excitement for reading.

We're thrilled about the impact AR Expeditions is having, and we'd love you to see it in action. If you'd like to learn more or experience our app firsthand, we invite you to visit our tables during lunch. Our team and the New Worlds Reading team will be there to answer questions, walk you through the technology, and let you try it out for yourself.

We truly appreciate your support as we continue developing new ways to make reading more engaging and accessible for students. Thank you again and Go Gators!