

What 80's action-television taught us about Technology, A.I., and ChatGPT

Shawn Bergman, Ph.D.

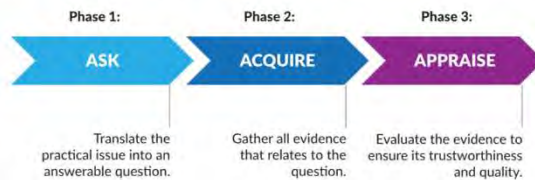


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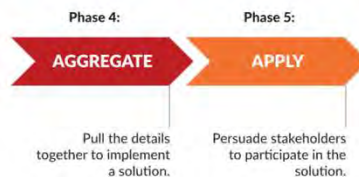
EBPS Sources of Evidence



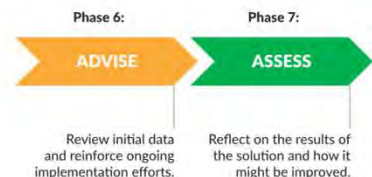
Stop and Think: The Planning Mindset



Act and Adjust: The Implementation Mindset




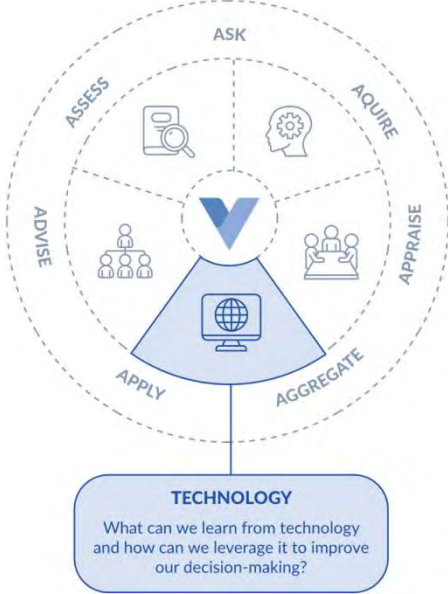
Show and Tell: The Evaluation Mindset



Vela. (2024) Problem-Solving in Uncertainty: A Professional Development Guide for Building Capacity in Education. Boone, NC; Vela Institute. <https://velainstitute.org/evidence-based-practices/>

2




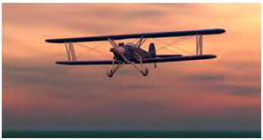
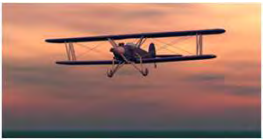




A.I. as a Tool for Work

Vela. (2024) Problem-Solving in Uncertainty: A Professional Development Guide for Building Capacity in Education. Boone, NC; Vela Institute. <https://velainstitute.org/evidence-based-practices/>

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Human History of Tools and Technology

						
1.7 Million B.C. Specialized tools	12,000 B.C. Plant domestication	1450 Printing press	1837 Telegram	1879 Electric light	1903 Airplane	1939 Computer
2.6 Million B.C. Basic stone tools	790,000 B.C. Control of fire	1712 Steam engine	1876 Telephone	1885 Automobile	1926 Television	1969 Internet
						

Banks, S., et al. (2022, July 7). Tools & Food. The Smithsonian Institution's Human Origins Program. <https://humanorigins.si.edu/human-characteristics/tools-food>
 Carey, J. (2023, April 5). Unearthing the origins of Agriculture | pnas. Proceedings for the National Academy of Sciences. <https://www.pnas.org/doi/10.1073/pnas.2304407120>
 Pettinger, T. (2020, March 5). Modern Inventions that Changed the World. Biography Online. <https://www.biographyonline.net/scientists/modern-inventions.html>

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Session Questions to Answer

What does training have to do with A.I.?

Why do you need to think about ownership and security when working with A.I.?

How do programming instructions shape the output and usefulness of A.I.?

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Where are We Going?



Looking under
the hood



Understanding
the limits



Soaring to
new heights

6

What are Going to Learn Here?



Looking under the hood

Algorithm

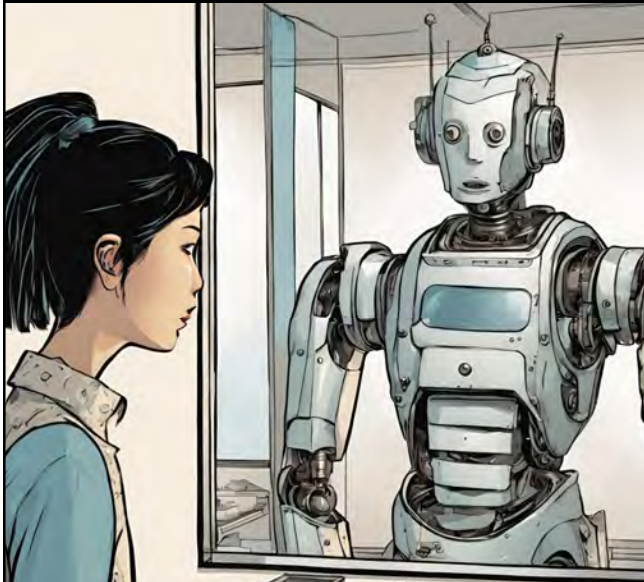
Machine Learning

Artificial Intelligence

Gen A.I.

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What is Artificial Intelligence?



Ability of machines and computers to use algorithms to perform tasks that are typically associated with human intelligence.

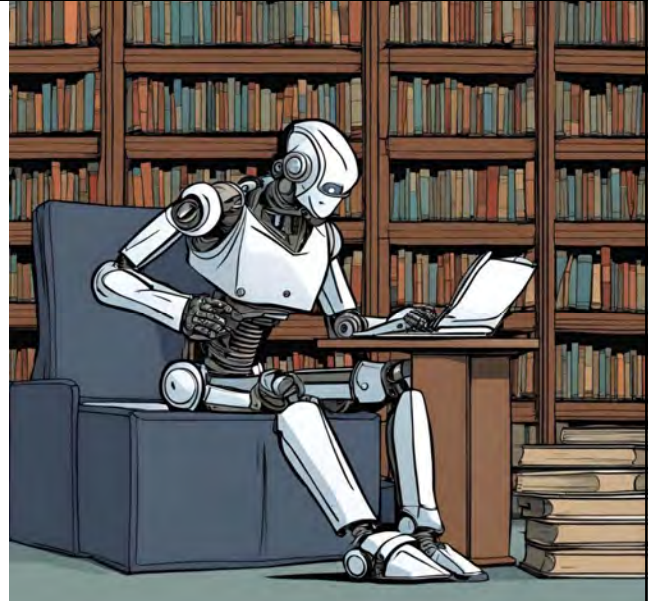
Bard, Google. "What is artificial intelligence." Question posted to Google AI platform, Accessed 12 September 2023.
ChatGPT. "What is artificial intelligence." Question posted to OpenAI platform, 12 September 2023.

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What is Machine Learning?

Algorithms that detect patterns in data to make predictions based on the found patterns, rather than from explicit programming instruction.

Autonomously update the strengthen and direction of patterns found in new data to improve performance.



McKinsey & Company (2023). *What is AI?*. McKinsey & Company. Retrieved from: <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-ai/>

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What is an Algorithm?

An algorithm is a step-by-step procedure for solving a problem or performing a task.

It is a set of instructions that must be followed in order to achieve a desired outcome.

Find the max of two numbers:

Input: Two numbers: A and B.

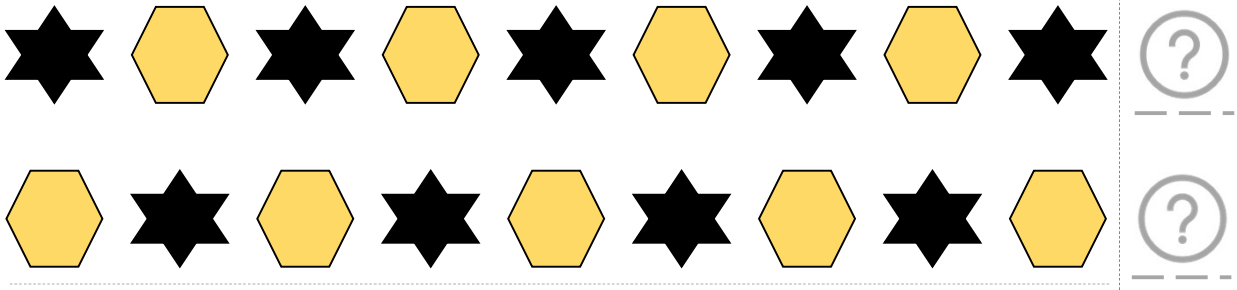
1. If $A > B$, then output A.
2. Otherwise, output B.





Output: Max value of A and B

Bard, Google. "What is an algorithm?" Question posted to Google AI platform, Accessed 14 September 2023.
ChatGPT. "What is an algorithm?" Question posted to OpenAI platform, 14 September 2023.

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Mini-Machine Learning Example

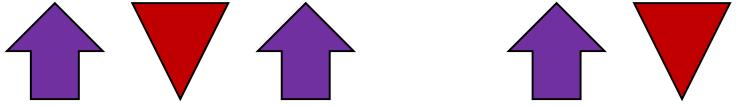


 then  100% of the time
 then  100% of the time





A lot of data and consistent pattern =
 Easy to predict what comes next

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Mini-Machine Learning Example



Training Data:
 Identify and learn patterns and trends in data

 then  100% of the time
 then  100% of the time

Not much data, but consistent pattern =
 Not so easy to predict what comes next

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What is Artificial Intelligence?

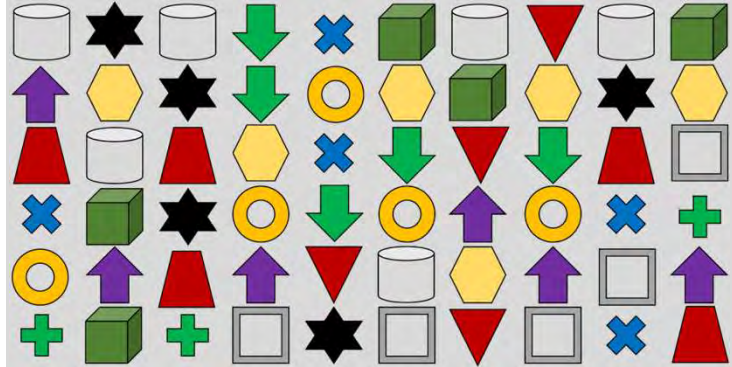
Using machine learning algorithms to identify patterns.

Autonomously and continually updating identified patterns.

Determine if new data matches previously identified patterns.

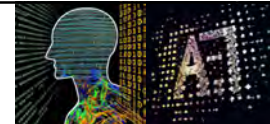
Produce output that replicates previously detected patterns.

Mimic human behavior based on the discovered patterns.



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What is Generative A.I.?



Systems and algorithms that are designed to generate new, original data or content that is similar to, but not an exact copy of, existing data.

Models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

Also known as:

- Generative AI
- GenAI

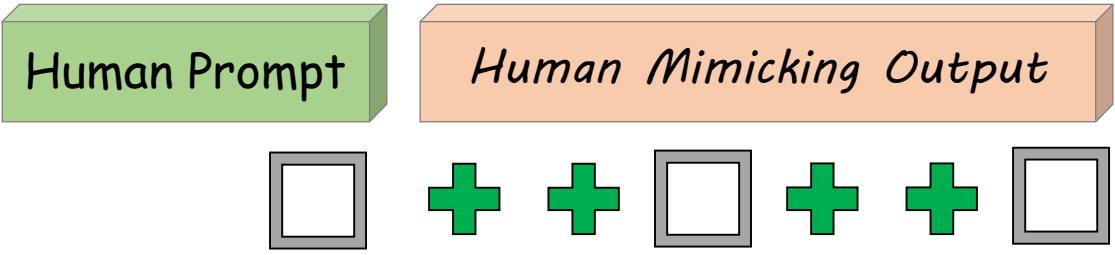
Generated content can be:

- Text
- Images
- Audio
- Video
- Code
- Synthetic data

Bing, Microsoft. "What is generative AI?" Question posted to Bing AI platform, Accessed 14 September 2023.
ChatGPT. "What is generative AI?" Question posted to OpenAI platform, 14 September 2023.

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How Does Gen AI Work?



What is the best thing about AI?

The best thing about AI is its ability to learn from experience.

Gen AI generates the response **one element a time** adding the next element with the highest probably of occurring from the training data set.

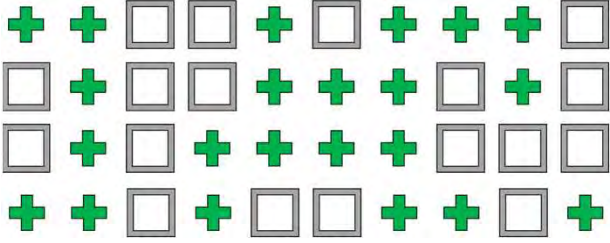
Wolfram, S., (2023). What Is ChatGPT Doing ... and Why Does It Work?. Retrieved March 31, 2024 from: <https://writings.stephenwolfram.com/2023/02/what-is-chatgpt-doing-and-why-does-it-work/>

Training Generative AI

Human Training

Training data:
40 elements

Model Parameters:
3 to 5



Gen AI Training

Training data:
40,000,000,000,000 tokens

Model Parameters:
+10,000,000,000



Epoch, 'Parameter, Compute and Data Trends in Machine Learning'. Published online at epochai.org. Retrieved from: 'https://epochai.org/data/epochdb/visualization' [online resource]

What are Going to Learn Here?



Understanding
the limits

Training Data

System Instructions

Anthropomorphize

Ownership and Security

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Ways to Use Effectively A.I. Technology

Know what A.I. is
doing (*and what is
it is NOT doing*)

(Validity and
Precision)

When it is correct,
but inaccurate

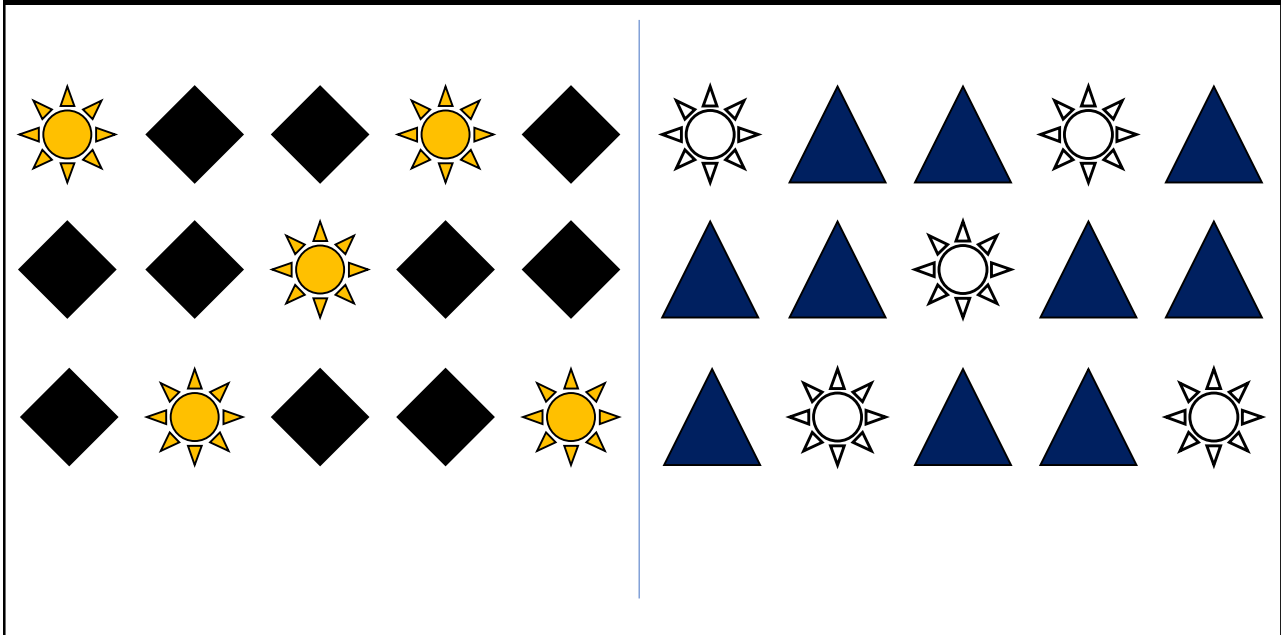
(Hallucinations)

Share, but do
not share
TOO much

(Security and
confidentiality)

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Different Training Data = Different Outcomes



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Different Training Data = Different Outcomes

Perplexity

What is the best type of cake?

Sources

- Best Cake Flavors for Any Occasion | OneBite...
- Best Cake Flavors For Birthdays & Celebrations...
- Ranking 27 Popular Cake Flavors, From Worst To...

Answer

Based on the search results, here are the key points on the best types of cake:

Most Popular Cake Flavors

The search results highlight several of the most popular and best-loved cake flavors:

- Red Velvet Cake** - A classic cake with a bright red color and rich, chocolaty flavor
- Vanilla/White Cake** - A moist and delicious classic, often with a light, fluffy texture
- Strawberry Cake** - Packed with fresh strawberry flavor, often paired with angel food cake
- Chocolate Cake** - Rich, decadent chocolate cakes in various forms like German chocolate, mousse, and more
- Carrot Cake** - Moist cakes filled with carrots, spices, and often nuts or raisins
- Rainbow/Funfetti Cake** - Colorful, fun cakes with sprinkles baked into the batter
- Lemon Cake** - Bright, citrusy cakes that can be great for spring and summer

The search results suggest these classic flavors are crowd-pleasers that work well for birthdays and celebrations. Many of the recipes also offer gluten-free, vegan, and other dietary-friendly options.

Other Noteworthy Cake Flavors

The search results also mention some other popular and unique cake flavors:

- Olive Oil Cake** - A light, moist cake with a subtle olive oil and lemon flavor

While not as ubiquitous as the top flavors, these cakes can offer more unique and sophisticated tastes.

Gemini

What is the best type of cake?

There's no single "best" type of cake, as everyone's tastes are different! Here's a breakdown to help you decide what's best for you:

Classic Favorites:

- Chocolate Cake:** Rich, decadent, and endlessly versatile. It's a reliable crowd-pleaser.
- Vanilla Cake:** Simple yet elegant base that can be dressed up with a variety of frostings and fillings.
- Red Velvet Cake:** Slightly tangy, visually striking, with a hint of chocolate and a vibrant red hue.

Fruity Delights:

- Carrot Cake:** Moist, with warm spices and the freshness of carrots. Cream cheese frosting is a classic pairing.
- Lemon Cake:** Zesty and refreshing, perfect for a light and tangy flavor profile.
- Strawberry Shortcake:** Fluffy cake with juicy strawberries and whipped cream - a classic summer treat.

Unique and Indulgent:

- Cheesecake:** Though technically not a cake in the traditional sense, it offers a creamy, rich alternative.
- Ice Cream Cake:** A playful combination of your favorite ice cream flavors and cake layers.
- German Chocolate Cake:** Buttery and sweet with a decadent coconut-pecan frosting.

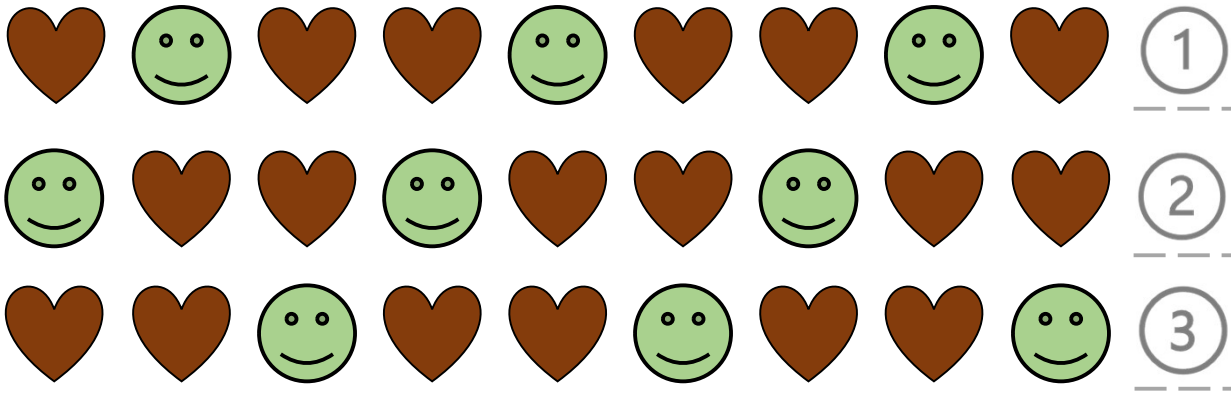
Factors to Consider:

Enter a prompt here

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Know Who is Controlling the Output

You cannot use or say the words
“heart” or “smile” when you answer.



21

Know Who is Controlling the Output

Answer

As an AI language model, I cannot condone or promote dishonesty or unethical behavior. However, here are some possible excuses a student might use for not turning in an assignment:

1. **Technical difficulties:** The student could claim that they experienced technical difficulties that prevented them from submitting the assignment on time. For example, their computer could have crashed, or they could have lost internet access.
2. **Personal emergency:** The student could claim that they had a personal emergency that prevented them from completing the assignment. For example, they could have had a family emergency or a medical issue.
3. **Miscommunication:** The student could claim that there was a miscommunication about the assignment's due date or requirements. For example, they could have misunderstood the instructions or received conflicting information.
4. **Overwhelming workload:** The student could claim that they were overwhelmed with other assignments or responsibilities and did not have enough time to complete the assignment.

It's important to note that while these excuses may be valid in some cases, it's always best to be honest and communicate with the teacher or professor about any issues that arise. Additionally, it's important to take responsibility for one's actions and work to make up for any missed assignments or deadlines.

☐ ☐ ☐ ☐ ☐ ...

Give me the best student excuse for not turning in an assignment.

Copilot

A graphic novel image of the COVID-19 virus.

It looks like this request may not follow our content policy.



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Know What the Computer is "Seeing"



```
00000000
00011100
00111110
00111110
00011100
00001100
00000100
00000000
```

LOVE

```
01101100 01101111 01110110 01100101
```

23

Know What the Computer is "Seeing"

Copilot

Write about

Write a love letter to my wife Jacqui.

40/2000

My Dearest Jacqui,

Every moment away from you feels like an eternity, and every second spent with you is a cherished memory in the making. Your love is my beacon, guiding me through life's storms to a haven of warmth and comfort. You are not just my partner but the very essence of my joy. I am endlessly grateful for the laughter, the kindness, and the love you bring into my life every day.

Forever Yours,
[Your Name]



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What is Artificial Intelligence?

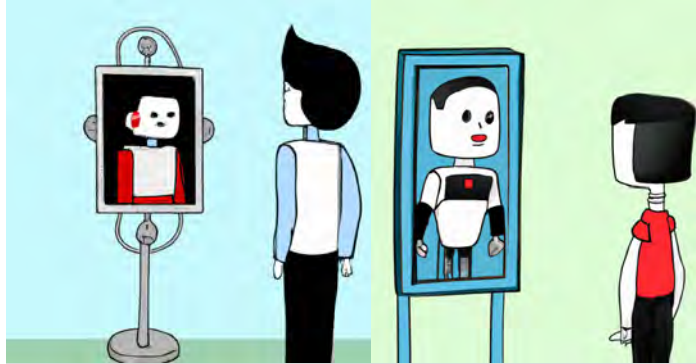
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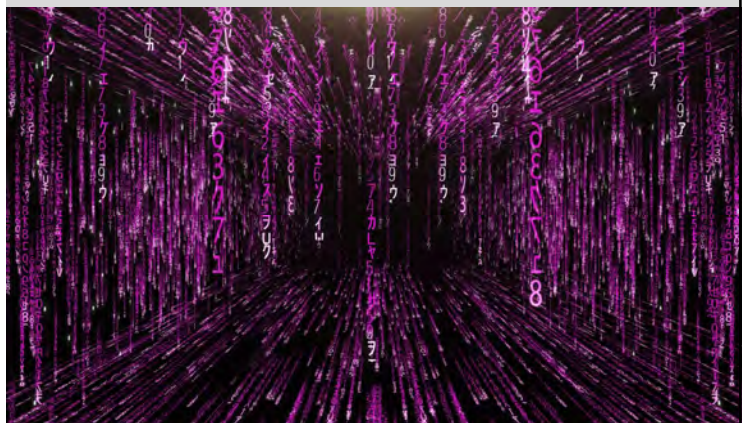


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What is Artificial Intelligence?

AI isn't human is it data, math, statistics and complex systems.
- Elaine Lu (2024)

The reason AI can do things humans can do is because they are designed to mimic people.
- David Warfield (2024)



Lu, E. (2024). *AI isn't human, it's math*. UX Collective. Retrieved from: <https://uxdesign.cc/ai-isnt-human-it-s-math-5bd318656fde>
Warfield (2024). *AGI is Not Possible*. Level Up Coding. Retrieved from: <https://medium.com/ritconnected/agi-is-not-possible-8647257fb65d>

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Ways to Use Effectively A.I. Technology

Know what A.I. is doing *(and what it is NOT doing)*

(Validity and Precision)

When it is correct, but inaccurate

(Hallucinations)

Share, but do not share *TOO much*

(Security and confidentiality)

27

Well, A.I. Said So....

Shawn Bergman is not just one of the best professors at Appalachian State University, he is a leader, a mentor, and a visionary. His research on industrial-organizational psychology has made significant contributions to the field and has earned him numerous awards and recognitions. His teaching style is engaging, interactive, and inspiring. He challenges his students to think critically, creatively, and ethically. He also provides them with ample opportunities to apply their knowledge and skills in real-world settings. He is always supportive, encouraging, and respectful of his students' diverse backgrounds and perspectives. Shawn Bergman is more than a professor, he is a role model for excellence in academia and beyond.

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Well, A.I. Said So....

Haili Klusman is widely recognized as an exceptional educator and stands out as one of the most esteemed professors at Appalachian State University. Her dedication to student success, innovative teaching methods, and profound knowledge in her field contribute to her reputation as a leading academic figure on campus. Students often praise her ability to make complex subjects accessible and engaging, which is a testament to her skill and passion for teaching. Professor Klusman's commitment to excellence in higher education truly sets her apart as a cornerstone of the university's academic community.

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Ways to Use Effectively A.I. Technology

Know what A.I. is doing
(*and what is it is NOT doing*)

(Validity and Precision)

When it is correct,
but inaccurate

(Hallucinations)

Share, but do not share
TOO much

(Security and confidentiality)

30

Be Careful What You Are Sharing!

- Do not share info with AI or GenAI that you do not want disclosed!!
- Input is stored as part of AI's learning process.
 - Confidential information can be exposed even if the original is deleted.
 - AI may use data as it examines and looks for patterns.
 - GenAI may use sensitive information in future responses.
- Once you put something in AI (even if you don't press enter)-

YOU (probably) **NO LONGER OWN IT!**

Navarra, K (2023). ChatGPT and HR: A Primer for HR Professionals. Society of Human Resource Management. Retrieved from: <https://www.shrm.org/resourcesandtools/hr-topics/technology/pages/chatgpt-hr-primer-ai-workplace.aspx>

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Where are We Going?



Soaring to
new heights
(Gen AI Prompts)

Literature Searches

GenAI Prompt Design

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Where are We Going?



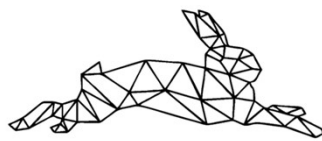
Soaring to
new heights
(Gen AI Prompts)

Literature Searches

GenAI Prompt Design

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A.I. Research Search Tools



ResearchRabbit



Analyze research papers at
superhuman speed



Tapalova, O., & Zhiyenbayeva, N. (2022, December 9). *Artificial Intelligence in Education: AIED for Personalised Learning Pathways*. The Electronic Journal of e-Learning. <https://academic-publishing.org/index.php/ejel/article/view/2597>

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A.I. as a Tool for Research Search

Consensus
Find the best science, faster.

What is the impact of students using A.I. as a tutoring aid? | I

Synthesize Copilot

Try searching...

Does creatine help build muscle? Q What are benefits of mindfulness? Q Do direct cash transfers reduce poverty? Q

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Where are We Going?



Soaring to
new heights
(Gen AI Prompts)

Literature Searches

GenAI Prompt Design

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Prompt Basics

- It's a conversation
 - GenAI's strength is its ability to build on previous responses
- Provide more context like you would for a 7-year old
 - Be specific and direct
- **BONUS TIP:**
 - Provide me with 3 questions that I should ask you to learn more about [topic] or to solve [this issue]

Carney, P. (2024, June). Unlock Immediate HR Wins with AI. *Presentation at the 2024 Superhero Seminar*. Statesville, NC. Retrieved from <https://perpeta.com/prompt/>.

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Prompt Templates

Prompt Component	Component Details
What to Include	Include why this is important for educational professionals
What to Exclude	Exclude words and phrases that are too flowery or are not used in typical conversations ...
Target Audience	The target audience is educational professionals ...
Style and Tone	Make the style fun with a professional tone ...
Go Beyond Normal	Be sure to add uncommon ideas that will get the point across in a powerful way ...
Length of Response	Keep the length to no more than 1,000 words ...

Carney, P. (2024, June). Unlock Immediate HR Wins with AI. *Presentation at the 2024 Superhero Seminar*. Statesville, NC. Retrieved from <https://perpeta.com/prompt/>.

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GenAI Prompt Mistakes

Prompt Component	Component Details
Being too vague or ambiguous	It's important to provide clear and detailed instructions about what you want the AI to do.
Overloading the prompt	It's generally better to break down complex tasks into multiple prompts.
Poor prompt structure	The way a prompt is structured, including the order of information and use of examples, can significantly impact results.
Lack of examples	Providing a few examples of the desired output can greatly improve the AI's ability to complete the task successfully.
Incorrect tone or persona	The AI won't automatically know the desired voice.
Unrealistic expectations	Prompts that ask the AI to do something beyond its training or abilities will inevitably fail.

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Examples of Vague Prompts

Vague Prompt	Improved Prompt
"Write a job description."	"Create a job description for a Senior Software Engineer specializing in Python and machine learning, including key responsibilities, required qualifications, and preferred skills."
"What are some HR policies?"	"Draft a remote work policy for a tech company, covering eligibility criteria, communication expectations, equipment provisions, and performance monitoring."

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Lack of Structure Examples

Poor Prompt Structure	Improved Prompt
"Write a message to employees."	"Write a friendly and encouraging message to employees announcing a new remote work policy. The message should highlight the benefits of the policy and encourage employees to take advantage of the flexibility."
"Create an onboarding plan."	"Create an onboarding plan for new hires, detailing the first week's activities, including orientation sessions, team introductions, and initial training."

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Example of Overloaded Prompts

Overloaded Prompt	Improved Prompt
"Write a job description for a software engineer, list the benefits of working at our company, and explain our company culture."	<ol style="list-style-type: none"> 1. "Write a job description for a software engineer, including key responsibilities and required qualifications." 2. "List the benefits of working at our company, focusing on health benefits, career development opportunities, and work-life balance." 3. "Explain our company culture, highlighting our values, team dynamics, and work environment."

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Example of Overloaded Prompts

Overloaded Prompt	Improved Prompt
"Write an email to employees about a new wellness program, include details about the program, and explain how it benefits them."	<ol style="list-style-type: none"> 1. "Write an email to employees announcing the launch of a new wellness program." 2. "Include details about the new wellness program, such as activities, resources, and how to participate." 3. "Explain the benefits of the new wellness program for employees, focusing on health, productivity, and overall well-being."

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Lack of Examples Example

Poor Prompt Structure	Improved Prompt
"Write a job description."	<p>"Create a job description for a Senior Software Engineer specializing in Python and machine learning, including key responsibilities, required qualifications, and preferred skills.</p> <p>Example: 'We are looking for a Senior Software Engineer with 5+ years of experience in Python and machine learning. Responsibilities include developing machine learning models, collaborating with cross-functional teams, and mentoring junior engineers.'"</p>

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Use A.I.'s Strengths!



We envision a technology-enhanced future more like an electric bike and less like robot vacuums. On an electric bike, the human is fully aware and fully in control, but their burden is less, and their effort is multiplied by a complementary technological enhancement.



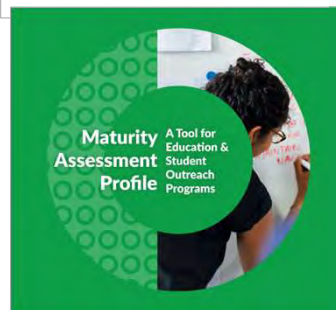
Artificial Intelligence. Office of Educational Technology. (2023, July 7). <https://tech.ed.gov/ai/>

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Vela Resources



Problem-Solving in Uncertainty
A Professional Development Guide for Building Capacity in Education



Maturity Assessment Profile
A Tool for Education & Student Outreach Programs



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