ETHICAL ARTIFICIAL INTELLIGENCE: BRIDGING TECHNOLOGY WITH CREDIBLE EVALUATION PRACTICES

RIPL MELLON WEBINAR SERIES
PRESENTER: JENNIFER P. VILLALOBOS, PHD
OCTOBER 07, 2024

1

SELF IDENTITIES & POSITIONALITIES

- First generation, ESL, Mexican-American
- Wife and mother of 3 teens
- Born and raised in East Los Angeles
- Trauma survivor
- Recovering "yes" person
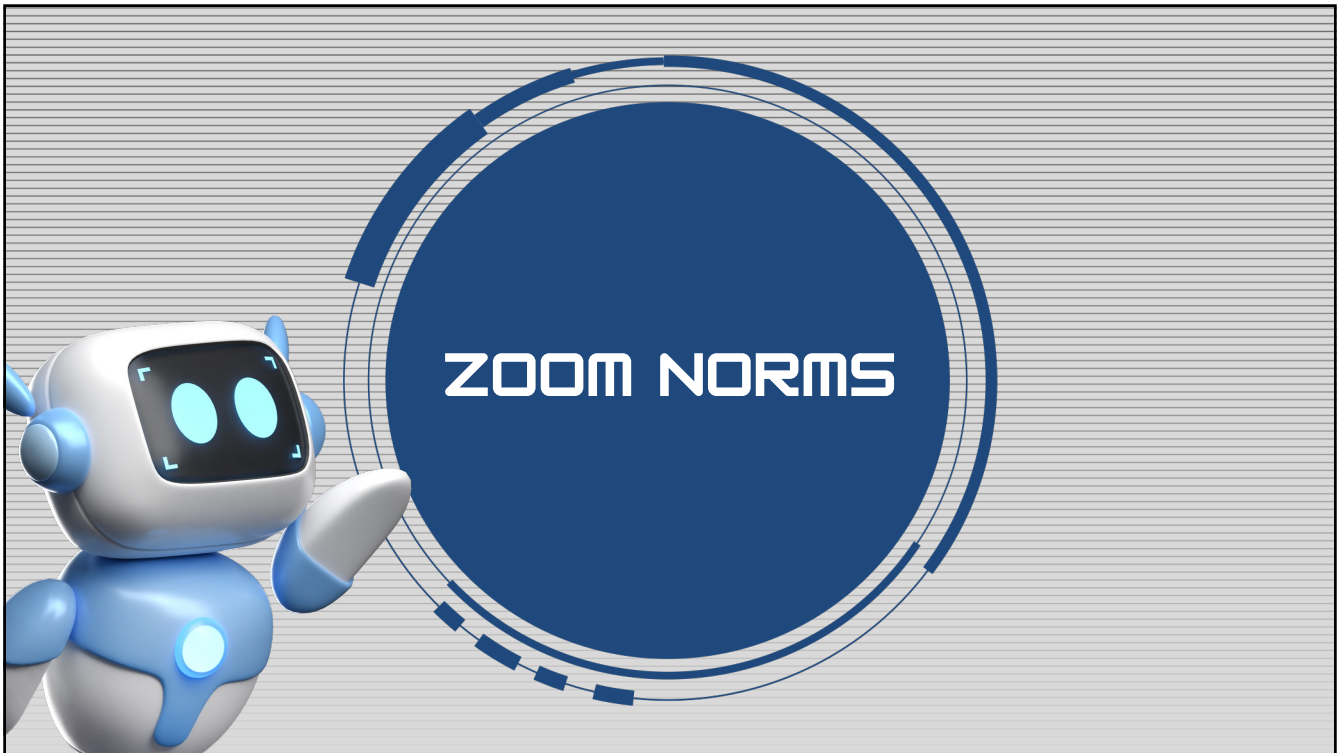- Cisgender/ heterosexual

Jennifer P. Villalobos, PhD
(She/Her/Ella)

- Social Justice Advocate
- AI Enthusiast
- 22+ years of research and eval experience
- Education Privilege: BA, MA, PhD
- Academy/Faculty
- Scholar Practitioner
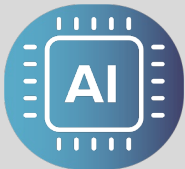- Top 5 Character Strengths: Love of Learning, Bravery, Honesty, Humor, Perspective

2

ZOOM NORMS

3

LEARNING OBJECTIVES

Demystifying and Understanding AI
Demystify AI by defining its core concepts, exploring various types such as machine learning and natural language processing, and articulating their practical applications in evaluation practices.

Apply AI Tools to Enhance Evaluation Practice
Gain insights into AI methodologies that can enhance the evaluation of library programs, service delivery, and community engagement.

Integrate AI Ethically into Evaluation Practices
Explore responsible integration of AI within library evaluation practices using practical steps focused on ethical evaluation standards. Discuss critical ethical considerations, including data integrity and developing effective AI prompts for data analysis.
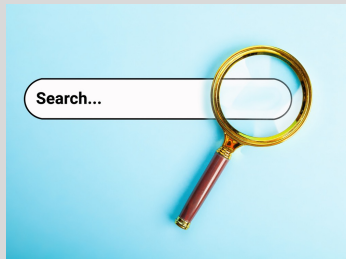
4

Tools we'll use!

Throughout the workshop, we will use several AI Resources, most free and accessible by browser.
You may follow along using the links below:

- **gemini.google.com**
- **chatGPT.com**
- **https://typeset.io/**
- **ChatPDF.com**

5

A few AI generated images based on my headshots
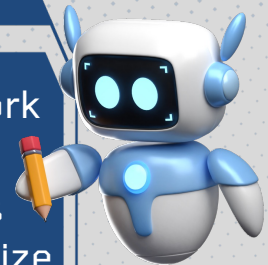

6

Proliferation of AI

7

POLL:

What is your proficiency with using AI in your work practice?

Suppose you are reading an evaluation results report at work created by a colleague and recognize language that might suggest AI was used in its development. How does this realization influence your perception of the quality of the document?

8

AI History and Milestones

1950's

Turing Test: Alan Turing proposes a test for machine intelligence, sparking debate about what constitutes AI.

Dartmouth Workshop: The term "Artificial Intelligence" is coined, marking the birth of AI as a field of study.

1960-70's

Early AI Programs: Development of programs like ELIZA (natural language processing) and Dendral (expert systems for chemical analysis).

AI Winter: Progress slows due to limitations in computing power and unrealistic expectations.

1980's

Expert Systems: Rise of rule-based systems for specific domains, demonstrating AI's potential for decision support.

Machine Learning: Algorithms that allow computers to learn from data gain traction.

9

AI History and Milestones

1990's

Deep Blue: IBM's chess-playing computer defeats world champion Garry Kasparov, showcasing AI's ability to tackle complex problems.

Data Mining: Techniques for extracting knowledge from large datasets become essential for business and research.

2000-10's

Big Data: Explosion of data availability fuels advancements in machine learning and AI applications.

Deep Learning: Neural networks with many layers achieve breakthroughs in image and speech recognition.
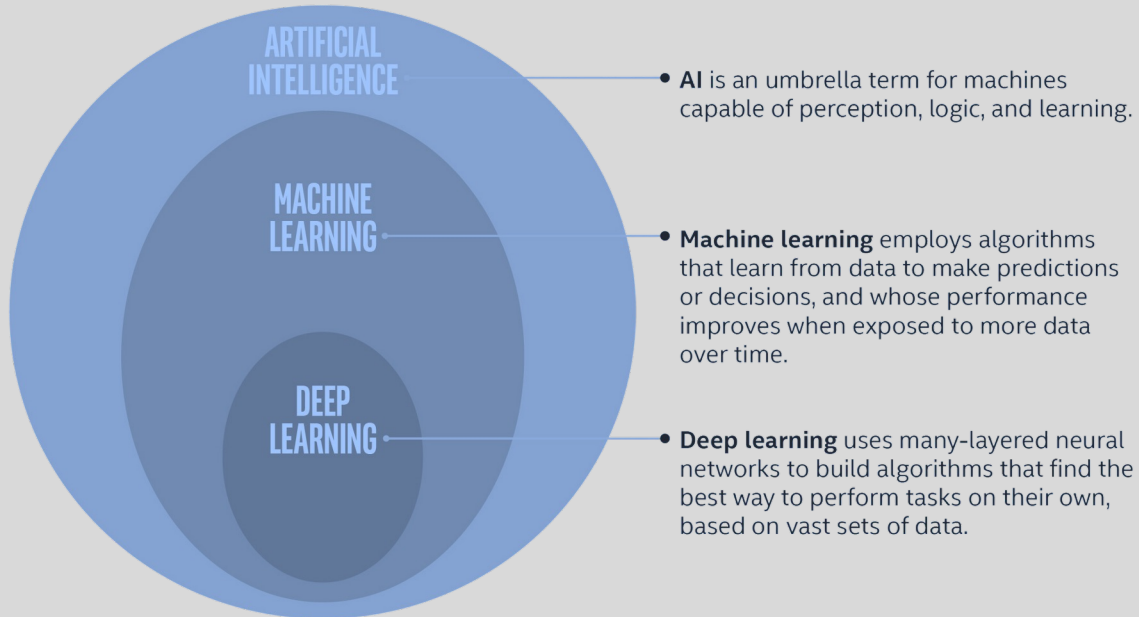
2020's

Transformer Models: Models like GPT revolutionize natural language processing, enabling AI to generate human-like text and perform complex tasks.

AI in Everyday Life: AI becomes integrated into various applications, from recommendation systems to autonomous vehicles.

10

AI Terms

ARTIFICIAL INTELLIGENCE

MACHINE LEARNING

DEEP LEARNING

- **AI** is an umbrella term for machines capable of perception, logic, and learning.

- **Machine learning** employs algorithms that learn from data to make predictions or decisions, and whose performance improves when exposed to more data over time.

- **Deep learning** uses many-layered neural networks to build algorithms that find the best way to perform tasks on their own, based on vast sets of data.

11

AI Functions

Analytic AI
Powered with machine learning (including its most advanced deep learning techniques), analytic AI scans tons of data for dependencies and patterns to ultimately produce recommendations (e.g., Spotify, Netflix)

Interactive AI
Automation of communication (e.g., chatbots, smart personal assistants)

Visual AI
Can identify, recognize, classify, and sort objects or convert images and videos into insights (e.g., augmented reality, computer vision)

Functional AI
Like Analytic AI, scans vast amounts of data, searches for patterns and dependencies in it, and takes action (e.g., robots, self-driving cars)
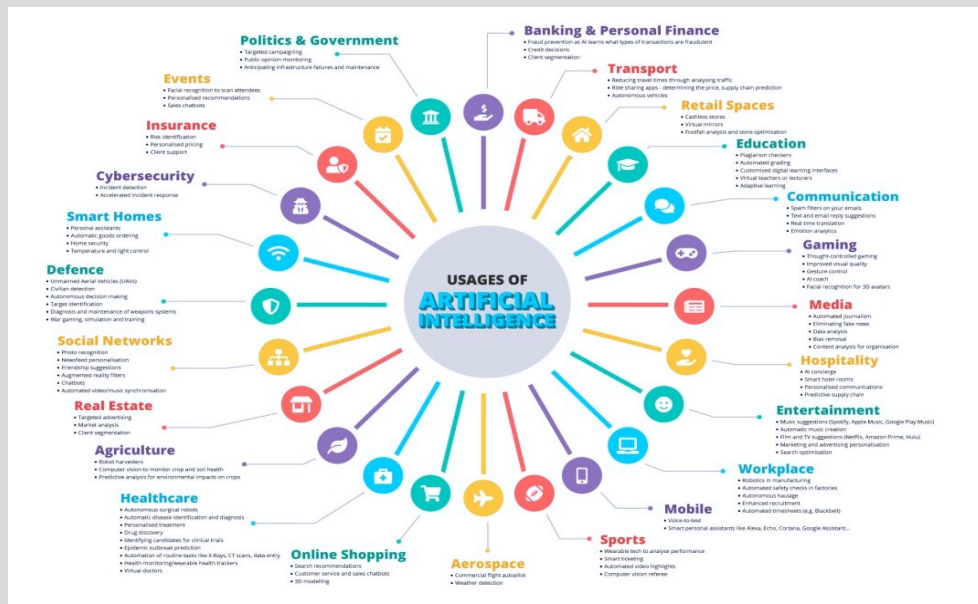
Text AI
Text recognition, speech-to-text conversion, machine translation, and content generation (e.g., talk-to-text)

12

Key Industries AI is Used

13

Who controls generative AI?
Ethical questions about who controls AI-generated content and the potential for misuse.

Overreliance on generative AI applications
Dangers of relying heavily on generative AI without critical evaluation, leading to acceptance of misleading outputs.

Unintended Consequences
AI models may produce unexpected or nonsensical outputs, impacting reliability and usefulness.

Environmental Impact
Energy-intensive nature of training and deploying generative AI models contributes to environmental degradation

14

AI in Evaluation

(Image: Raftree, 9/21/24)
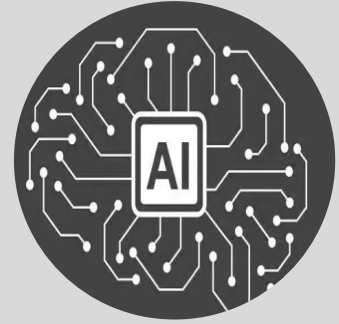
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*Contemporary evaluators have long espoused our need to be **agile, innovative,** and **responsive** to societal changes. The rapid deployment of AI is just another opportunity for us to remain at the forefront of technology that, if properly vetted and strategically used, can ensure our evaluations remain **relevant**, **credible**, and **effective** in shaping decision-making.*
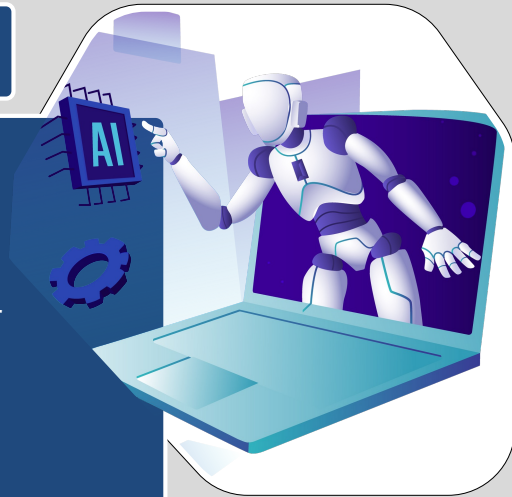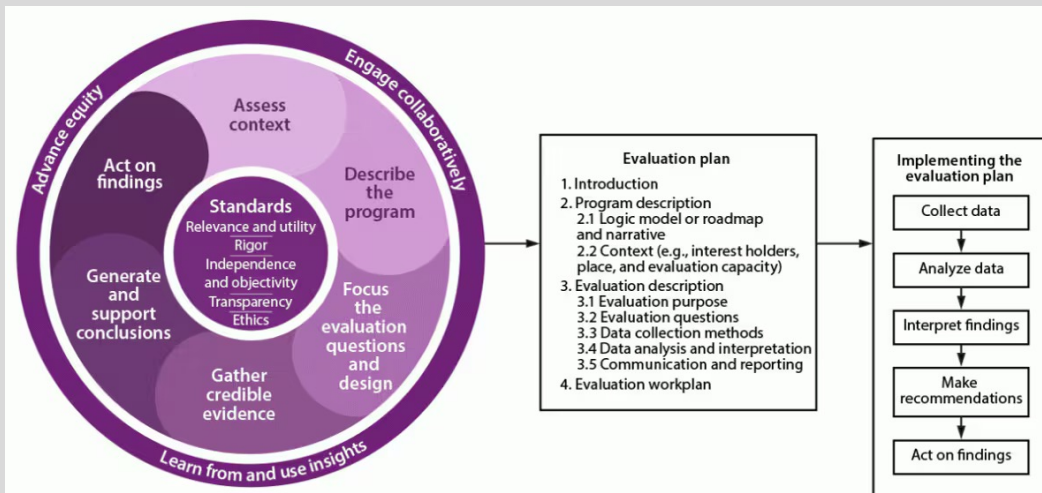

(Guedenet and Villalobos, 2024)

16

EVALUATION AI ETHICS

In the Chat...

Using examples from your evaluation activities in your work as a librarian or library employee, list some potential ethical issues when integrating AI.
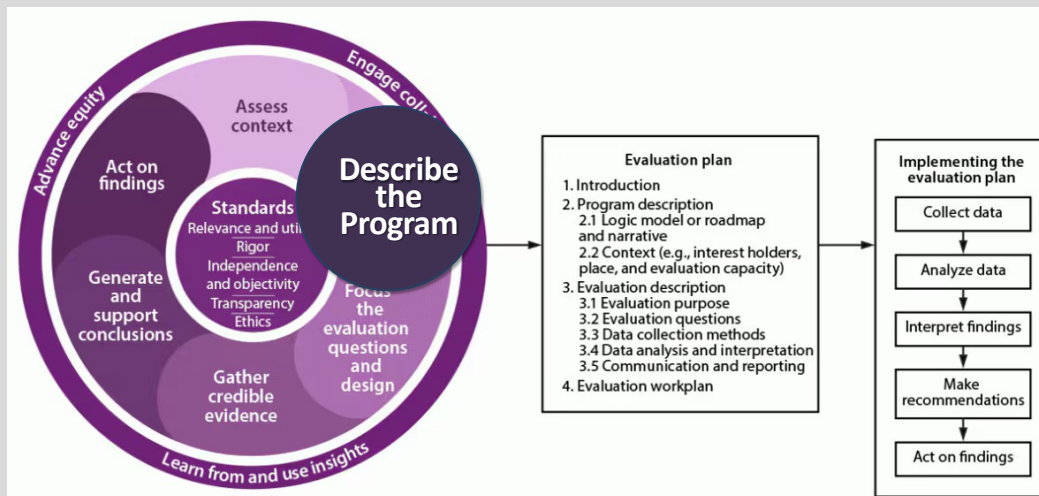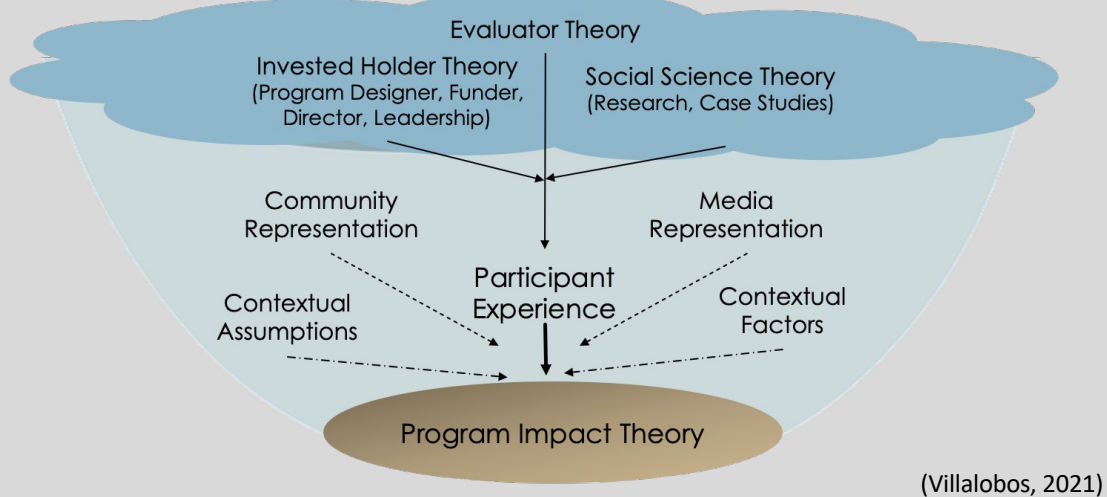
17

CDC Evaluation Framework
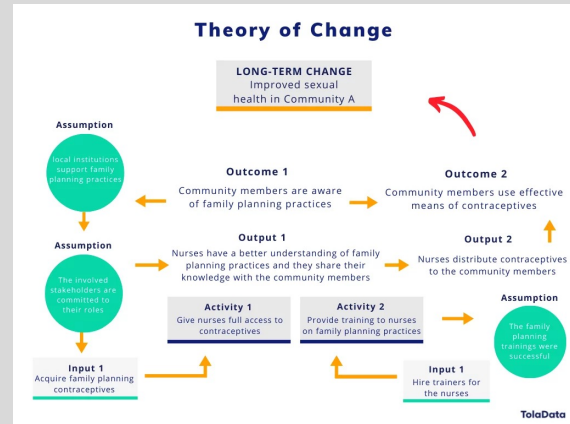## September 2024

18

CDC Evaluation Framework
September 2024

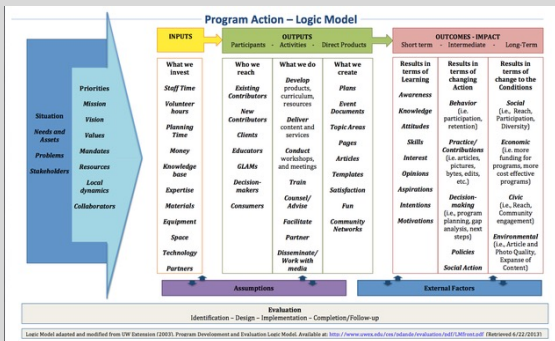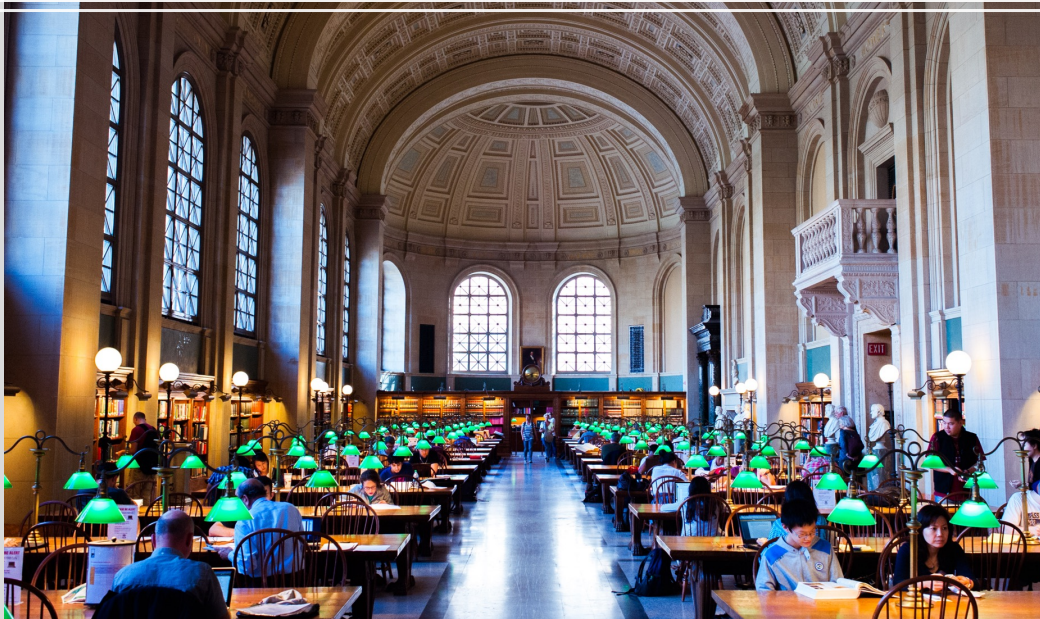19

(Villalobos, 2021)

Program Theory

20

Program Theory Models

21

How Can Digital Tools Help?

22

Practical Examples of AI in Evaluation: Describing the Program

Information Narratives and Data Synthesis. AI systems generate draft summaries and key themes from large chunks of data input, significantly reducing the time and effort required for manual compilation.

Visualization Software: AI Tools can (e.g., Lucidchart, Canva) can be used to visually map out program theories (intuitive drag-and-drop interfaces that can be used to create flowcharts or diagrams that clearly outline the relationships).
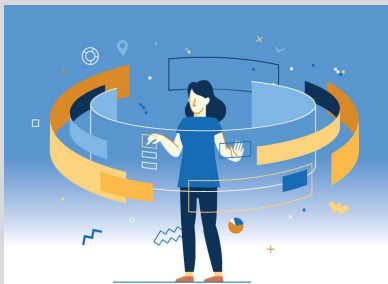
Collaborative Platforms: Platforms like Microsoft or Google Workspace enable real-time collaboration among various types of community members. Especially useful in gathering input and consensus from diverse groups where multiple perspectives can be considered.

Literature Reviews. AI research assistant tools can help identify and access relevant literature. Useful for early-stage literature exploration (e.g., SciSpace, ResearchRabbit)

23

Practical Examples of AI in Evaluation: Describing the Program

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24

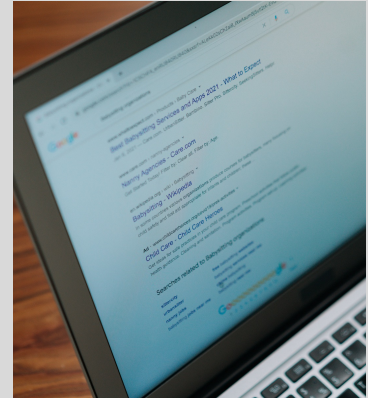## Information/Literature Searches

Google searches

Google uses **country and location to deliver content relevant for your area**. For instance, if you're in Chicago and you search "football," Google will most likely show you results about American football and the Chicago Bears first.

Google scholar

Google Scholar ranks results with a combined ranking algorithm. This algorithm takes into consideration the **full text** of each article, the **author**, the **publisher** and how often the piece has been **cited** in other scholarly literature.
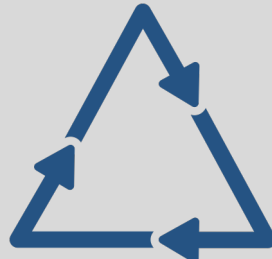
PubMed

PubMed searches for the **keywords** in the article **title, abstract** and **subject headings**. It does not search the full text of the article. Results show up with the most relevant articles, as predicted by PubMed, first in summary format

25

Information/Literature Searches

26

SCISPACE: https://typeset.io/

How it works:

- Literature searches - moderately effective
- Understand complex texts. Highlight the relevant section and let SciSpace summarize or explain it for you.
- Delve deeper into a topic by asking follow-up questions to engage more effectively with the text.
- Format research papers easily and preview them before publishing.
- Use the 'track changes' feature to collaborate on projects, and take advantage of SciSpace's suggestions to improve your work.
- Plagiarism and AI detection.
- Citation generator that lets you create a citation in any popular format.

Discover, read, and write research

SCISPACE

27

ChatPDF: https://www.chatpdf.com
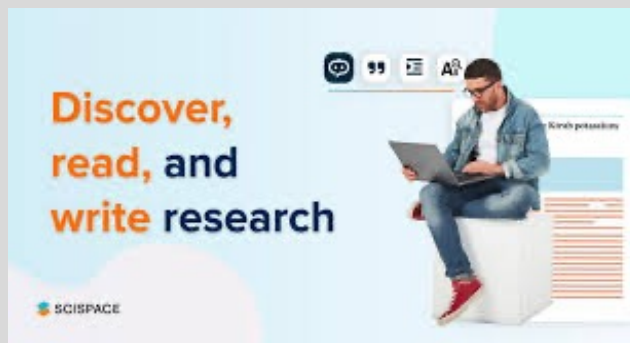
How it works:

- ChatPDF browses uploaded PDFs, providing instant answers to your questions. It simplifies complex terms and concepts for easy understanding.
- Supports any PDF file and automatically recognizes the language of the file as the default language of the conversation
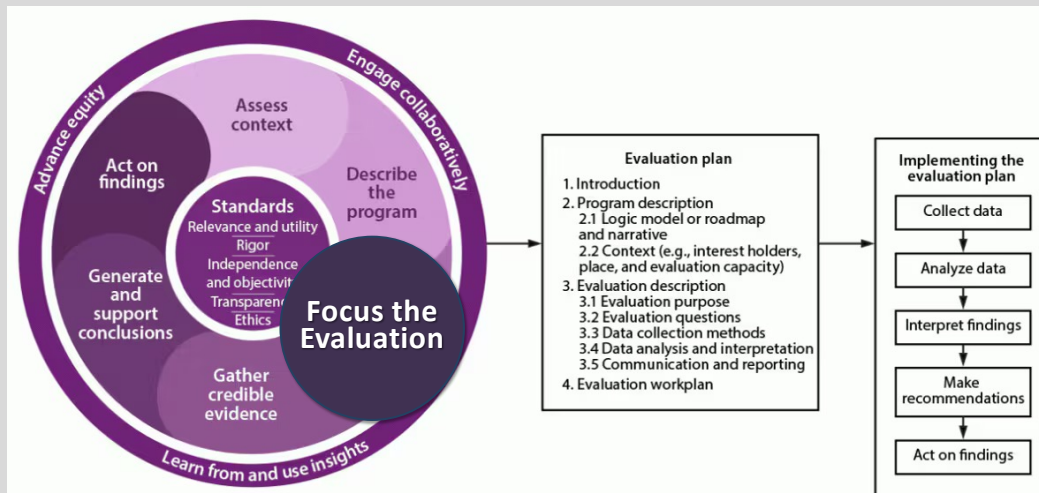- Doesn't require a login

ChatPDF
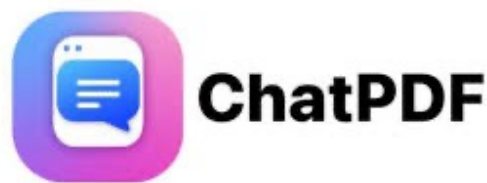
28

DEMONSTRATION
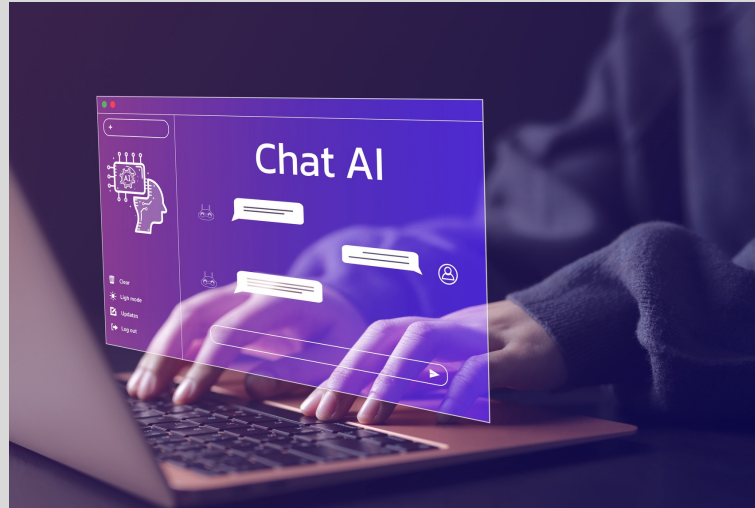
29

CDC Evaluation Framework
September 2024

30

Focus the Evaluation:
Data Collection Surveys

Using AI to co-construct survey and/or qualitative protocols is helpful for:
1. identify patterns, correlations, and question structures that work well
2. language bias checks
3. design best practices (e.g., double-barreled questions)
4. piloting: face validity/construct validity (e.g., QoL in USHS Eval)
5. suggestions for length, flow, clarity

31

Focus the Evaluation:
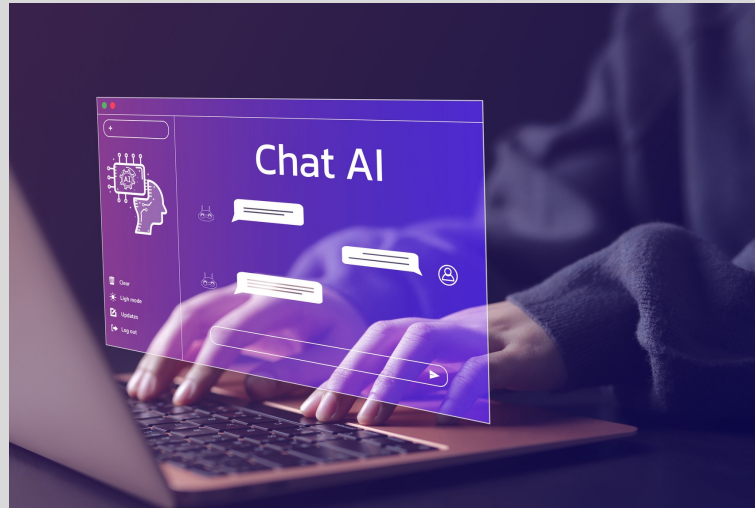## Data Collection Qualitative Protocols

Use AI to co-construct qualitative protocols to:
1. Identify key concepts for questions
2. Ensure comprehensive coverage of topics
3. Enhance the relevance and depth of the question
4. Language bias checks
5. Design best practices
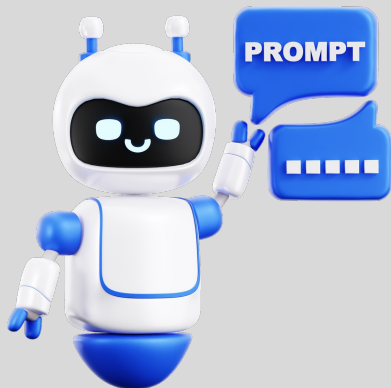6. Suggestions for length, flow, clarity
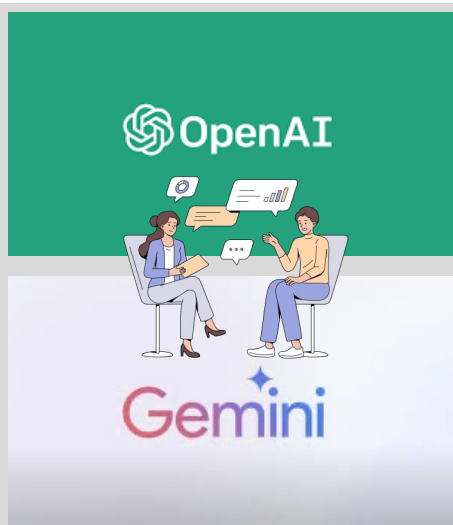
32

DEMONSTRATION

33

TUTOR YOUR AI

- Provide clear instructions and use line breaks for better readability.
- Clearly define the desired tone and length for AI-generated content.
- Identify style/voice based on the target audience.
- Provide reference materials (context) to guide the AI to minimize inaccuracies.
- Break down big tasks into smaller, more manageable parts to establish context..
- Encourage the AI to follow logical steps in reasoning to reach accurate conclusions.
- Continuously measure and record the AI's performance to make necessary adjustments.
- Direct your AI to retain memory

34
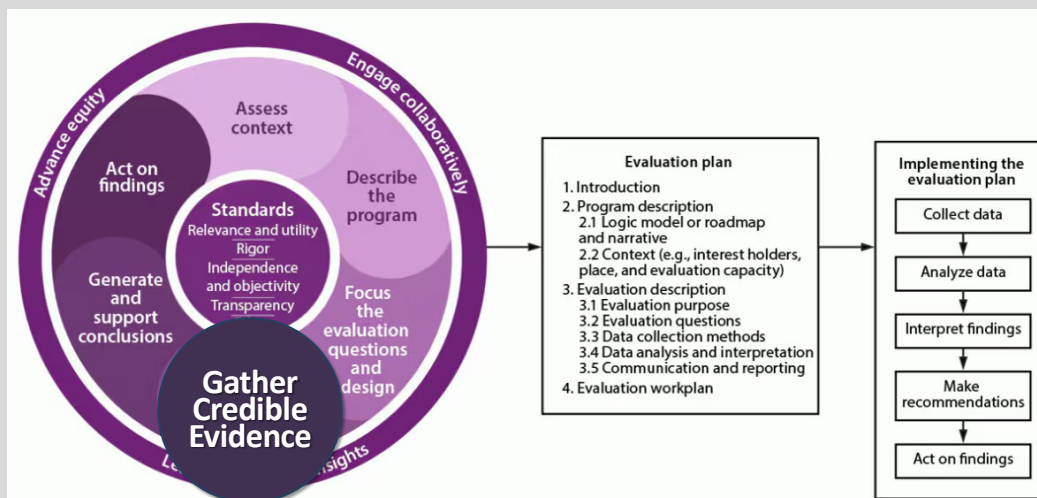
CDC Evaluation Framework
September 2024

35

Gathering Credible Evidence:
Analyzing Quantitative Data

AI can assist in analyzing data to:

1. Clean and process data making it free of errors and inconsistencies
2. Perform initial analyses, such as identifying trends, outliers, and patterns in the data
3. Advanced: develop predictive models; model validation
4. Help interpret data results and generate insights and recommendations based on the analysis.
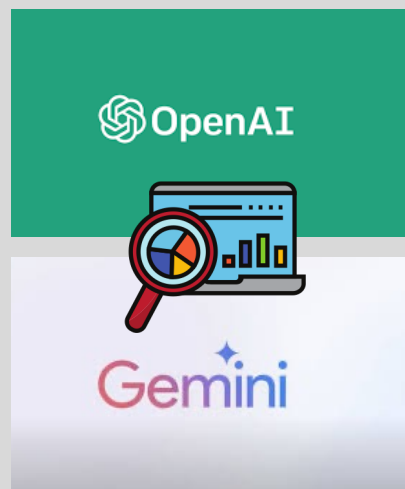

36

Gathering Credible Evidence: Analyzing Qualitative Data

Use AI to analyze qualitative data:
1. Automatically code large volumes of text and quickly identify themes and patterns that would take much longer to detect manually.
2. Analyze the sentiment of textual data, providing insights into participants' perceptions and opinions.
3. Summarize lengthy qualitative data, highlighting key points and significantly reducing complexity.
4. Understand context and nuances in language and enhance data interpretation's depth and accuracy.
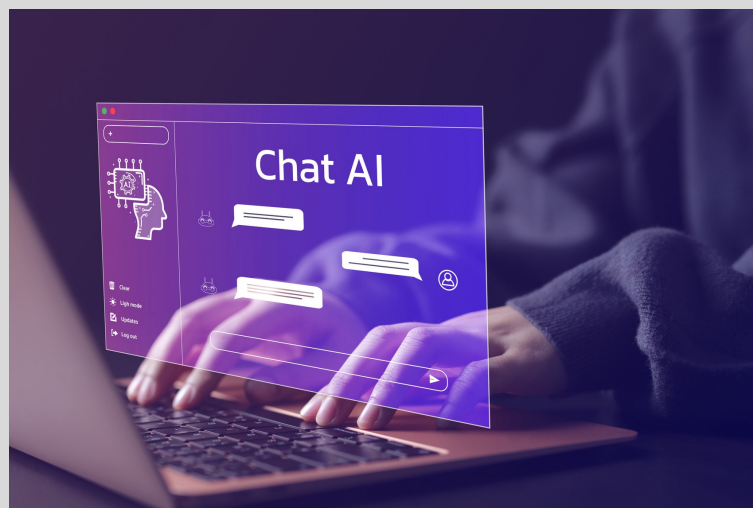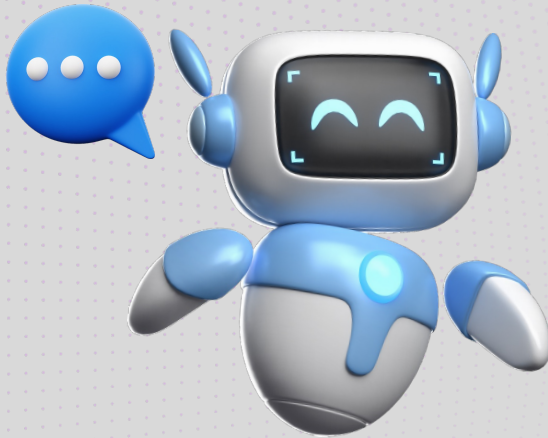5. Identify potential biases in qualitative data; a more objective analysis.

AILYZE
https://www.ailyze.com

OpenAI

Gemini

37

DEMONSTRATION

Chat AI
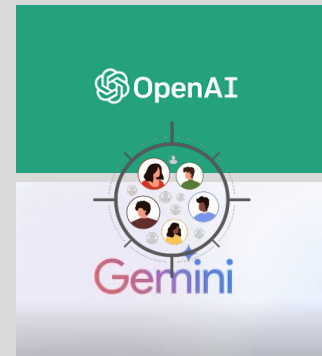
38

PROTECT SENSITIVE INFORMATION

USE CODES FOR DEMOGRAPHICS

PAID SUBSCRIPTIONS OFFER ENCRYPTION

USE VARIABLE ABBREVIATIONS

39

Gathering Credible Evidence: Analyzing Data
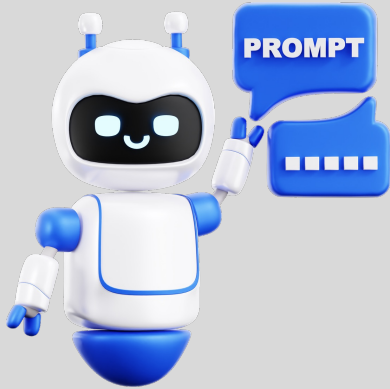
TOP TIPS

OpenAI

Gemini

The more **assumptions**, **cultural considerations**, and **contextual information** you provide your chatbot, the more **relevant** information it will generate (e.g., for prison evaluations, youth and adolescent participants, and vulnerable participants).

40

TUTOR YOUR AI

- Provide clear instructions and use line breaks for better readability.
- Provide reference materials (context) to guide the AI to minimize inaccuracies.
- Break down big tasks into smaller, more manageable parts to establish context.
- Ask questions about decisions your AI made (e.g., one-tailed v. two-tailed t-test)
- Continuously measure and record the AI's performance to make necessary adjustments.
- Direct your AI to retain memory

41

TO THE EXTENT POSSIBLE CHECK AI'S WORK!

42

AI is a RESOURCE, TOOL, ASSISTANT

...NOT REPLACEMENT!

43

Key Considerations

- AI is NOT simply software
- Bias is Universal
- Ethical guardrails are necessary
- Train and check your AI

(Ferretti et al., 2024)

44

"People always confabulate. Half-truths and misremembered details are **hallmarks of human conversation***: Confabulation is a* **signature of human memory.** *These models are doing something just like people."*

Geoffrey Hinton, 'Godfather of AI', MIT Technology Review, 2024

45

ChatGPT: show me picture of a community library and librarian using digital tools to make her evaluation work more efficient and ethical

46

Prompt & Group Resources

- Chat GPT prompts for M&E Experts: https://www.annmurraybrown.com/amp/chatgpt-for-m-e-experts-writing-prompts-for-impactful-insight
- One Useful Thing: https://www.oneusefulthing.org/p/working-with-ai-two-paths-to-prompting?utm_source=substack&utm_medium=email
- Prompt Engineering: https://amatria.in/blog/PromptEngineering
- **MERL Teach LinkedIn Group: https://www.linkedin.com/groups/9311443/**
- **GPT Central: https://gptcentral.beehiiv.com** (newsletter with access to 100's of guides)
- **Natural Language Processing Community of Practice (NLP-CoP): https://www.linkedin.com/groups/9311443/**

47

Reflection Questions

1. How will you use or interact with AI in your evaluation work following this workshop?
2. What aspects of your work as a librarian or library employee be impacted positively or negatively by AI?
3. Which aspects of your work as a librarian or library employee will be fully replaced by AI?
4. Which aspects of your work, including your evaluation work, will be forced to change due to the evolution of AI?
5. How will your library community benefit from AI?

48

Questions?

49

Contact Me!

JENNIFER VILLALOBOS
JENNIFER.VILLALOBOS@CGU.EDU

CONNECT WITH ME ON LINKEDIN:
HTTPS://WWW.LINKEDIN.COM/IN/JENPV/

50