

REVISE Informational Webinar: Equity and AI in Informal STEM Learning

May 29th, 2024

All slides are available on InformalScience.org!



Overview



Definitions and AI basics



AI use in informal STEM spaces



Equitable and ethical considerations



Hear from an AISL project!



Q&A

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The **Reimagining Equity and Values in Informal STEM Education (REI SE)** Center is a resource center for the National Science Foundation (NSF) Advancing Informal STEM Learning (AISL) program and is supported by the National Science Foundation (NSF) award DRL-2229061. REI SE is a collaborative effort to **advance equity across the informal STEM education field.**

Core functions:

- Promote equitable practices that support the AISL program and disrupt patterns of inequity across the ISE field
- Cultivate a multi-sector, diverse community dedicated to promoting equity in ISE experiences and environments
- Raise the visibility and impact of equity-focused research and practice in the ISE field and its contributions to the overall STEM endeavor
- Support AISL PIs, prospective PIs, and partners in enacting their commitments to equity with respect to research and practice



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Artificial Intelligence

As defined in the Executive Order on the Safe, Secure, and Trustworthy Development and Use of AI, October 2023

“Artificial intelligence” or “AI” : a machine-based system that can, for a given set of **human-defined objectives**, make **predictions, recommendations, or decisions ...**

- Artificial intelligence systems use machine- and **human-based inputs** to perceive real and virtual environments; abstract such perceptions into models through analysis in an automated manner; and use model inference to formulate options for information or action.

AI is not new!

sentence ✕ ⓘ ⋮
This sentnce has a typo.

+ Can you guess what I'm saying n ↕
"n" now next

NETFLIX Home TV Shows Movies New & Popular
Your Next Watch

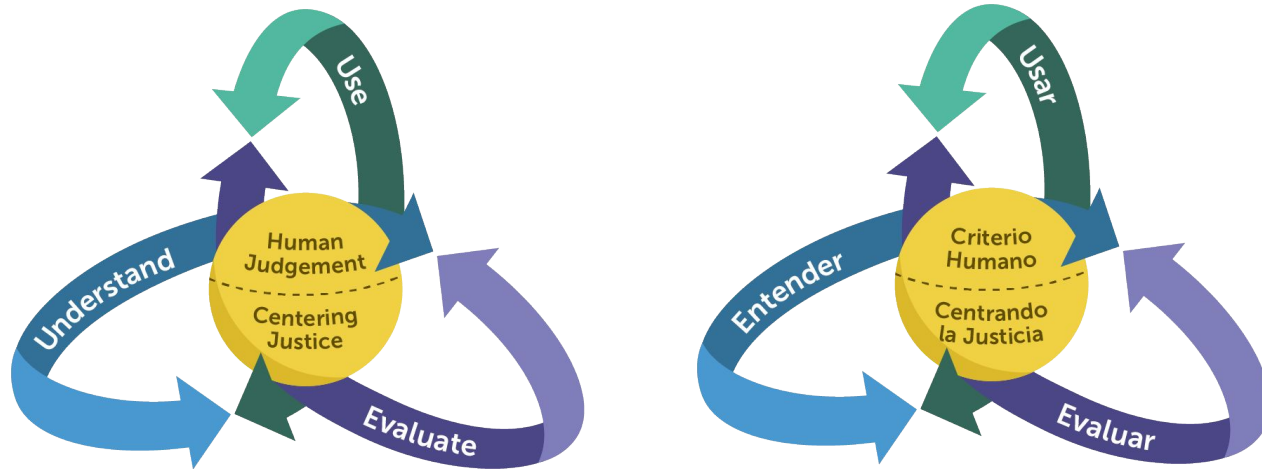
Generative AI

As defined in the Executive Order on the Safe, Secure, and Trustworthy Development and Use of AI, October 2023

The term “**generative AI**” means the class of AI models that emulate the structure and characteristics of input data in order to generate derived **synthetic content**. This can include images, videos, audio, text, and other digital content.

AI Literacy

We define AI literacy as the **knowledge and skills** that enable humans to **critically understand, use, and evaluate AI systems and tools** to safely and ethically participate in an increasingly digital world.



AI Literacy



While AI tools are new, and likely intimidating for many people, the skills that we use to **critically understand, use, and evaluate technology** are more familiar

Media Literacy

The ability to access, analyze, evaluate, create, and act using all forms of communication

(National Association for Media Literacy Education, 2024)

Digital Readiness

Thinking critically, behaving safely, and participating responsibly in the digital world

(Common Sense Media, 2017)

Computational Thinking

Solving problems systematically so that a computer could support the process or product development

(Mills et al., 2021)

Equity and Ethical Considerations

Critical AI

Critical AI is an approach to examining AI from a perspective that focuses on **reflective** assessment and critique as a way of understanding and **challenging** existing and historical structures within AI.

Human-centered Perspective

A human-centered perspective sees AI systems working with humans and helping to augment human skills. **People should always play a leading role** in education, and AI systems should not replace the human.



Equity and Ethical Considerations



Access

Region, socioeconomic class, and what is available at home can all affect who can use and pay for AI tools

Data Privacy

What data are you putting into AI tools? How are the developers behind these tools using your data? Who are they sharing your data with?

Accessibility

Does the AI tool meet accessibility suggestions? What assistive tools are put into place for those who cannot fully utilize the AI tool?

Algorithmic Bias

AI pulls from data sets sourced from all over the Internet. These tools can reinforce human biases and produce harmful content about the user.

AI Use in STEM Education

Most policy, research, and regulation around AI use and learning is being done in formal education settings

Some concerns include:

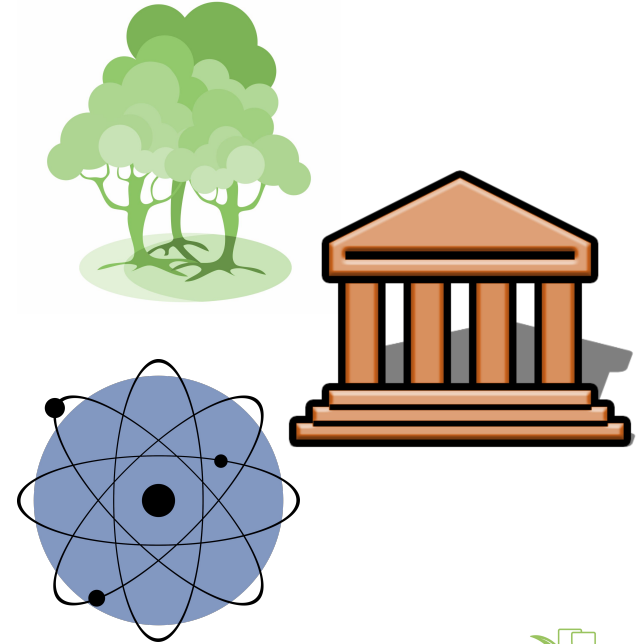
- Cheating
- Impersonating others through messages or deep fakes
- Accurately measuring assessment




AI Use in Informal STEM

How can AI and other emerging technologies be used in informal STEM learning?

- Designing programs
- Data analysis
- Synthesizing feedback
- Creating templates (e.g. consent forms)
- Programs to build interest in STEM
- Evaluations
- Tool to guide learners



**How does your
organization and/or
program use AI?**



AI Use in Informal STEM: Ethical Considerations

There is less regulation and work being done in informal STEM learning settings, so practitioners and researchers must exercise more caution and build AI literacy skills to ensure that the tools that they are using are the most effective and ethical choices.

Equity and Ethics



Tool Selection

How are you measuring what the best AI tools are for your organization and/or program? Who else is involved? How are you finding these tools?

Data Privacy and Trust

What are you putting into AI tools? How will you be transparent about this with the communities that you are working with, especially to build trust with them?

Accessibility

Are the tools you're selecting meet the needs of the communities and colleagues that you are working with? How will you support those with barriers?

Bias and Misinformation

AI will inevitably present misinformation and potentially harmful, biased content. How might this affect the communities you work with?

Other considerations

Use what already exists

- Privacy policies
- Organization's technology acceptable and responsible use policies

Continue to encourage creativity

- Informal STEM education gives learners the opportunity to engage in what personally interests them
- Programs should be culturally responsive to the learner
- AI can be used to help prompt and guide, but the end result should reflect the human





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Humanistic Approaches to Artificial Intelligence Literacy Through Informal Learning Conference

October 19th-20th 2023

Anthony Negron- Director of Digital Programming at The New York Hall of
Science

Conference Learning Goals and Outcomes

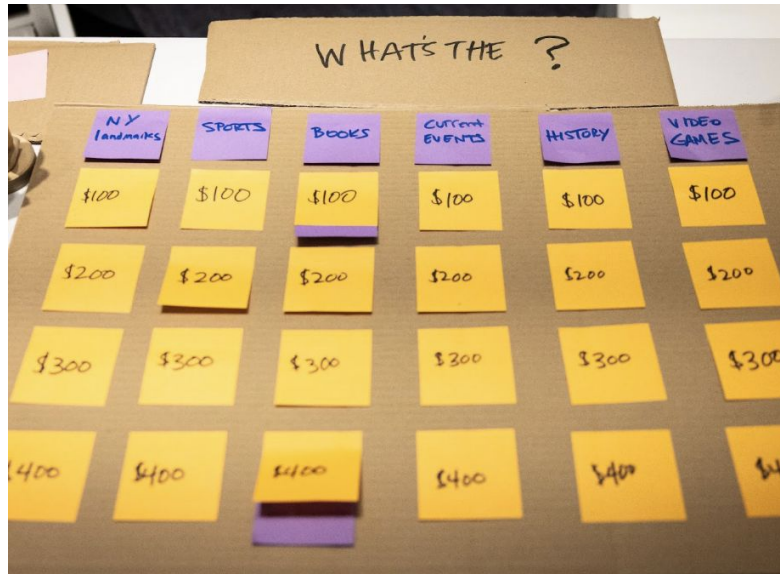
The main goal of this work is to **identify promising roles that informal learning institutions can play in fostering AI literacy and human agency with AI**, putting diversity, equity, accessibility, and inclusion at the center of those efforts. To achieve this goal, we focused on the following components in our discussions and activities at the conference, including:

- *Compelling use cases*
- *Strategies to increase engagement of diverse communities*
- *Future directions for research and program development*
- *Collaborations and partnerships*
- *Strategies to form and grow a community of practice focused on AI literacy through Informal Learning*

What We Accomplished

- **Forty-five experts, practitioners, students, and researchers** participated in the two-day conference. The attendees represented a diverse community, representing different industries and professions, areas of expertise, career levels, and sectors
- **Eight forward-thinking ideas** for future programs that centered around humanistic AI and informal learning opportunities were generated from the Design Sessions (see the “[Ideas for Future Programs](#)” page for more details).
- A keen interest in forming a **community of practice** has emerged to support continued experimentation with programmatic ideas generated, a refinement of a [human-centered AI literacy framework](#), sharing of resources, and collaborations for conducting design research within diverse communities.
- The outcomes of this conference reflected the urgency of **shaping AI literacy conversations**, and highlighted the **strength that informal learning can provide in addressing this multidisciplinary, cross-generation task**.

Jeopardy for Prompt Engineering



Learning Goals: Develop prompt engineering skills (skills needed to tell AI what to do)

Audience: Middle school learners

Program Format: Pop-up community experience



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Q&A





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