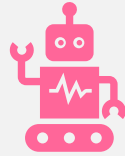


Leveraging Generative Artificial Intelligence for Teaching and Learning

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College of the North Atlantic



Presentation Outline



GenAI and post-secondary
education



Content-Integrated AI Learning
Model



Q&A

What is Generative AI (GenAI)?

- Uses machine learning to generate a variety of content by drawing from and learning from already available content.
- Prompts are used to create text, video, music, speech, software code, product designs, etc.
- Gained attention since 2022, when ChatGPT was released.
- Text Generation (Chatbots): ChatGPT, Claude, Copilot, DeepSeek, Gemini, Grok, MetaAI
- Image Generation and Graphic Design: Adobe Firefly Canva, Magic, DALL-E 2, Midjourney
- Knowledge Management: Notion AI, Google NotebookLM
- Music Generation: Suno, Udio
- Notetakers and Meeting Assistants: Built in (e.g., Zoom), Otter.ai
- Scheduling: Reclaim, Calendly
- Video Generation and Editing: Synthesia, Runway, Filmora, OpusClip
- [...]

Examples of Generative AI for Teaching and Learning



Program development

Identifying industry needs
Calculating an appropriate course duration
Choosing different delivery modes



Course development

Idea generation
Automated content generation
Drafting course content



Delivery

Drafting lesson plans, learning outcomes
Exploring pedagogical strategies



Course materials

PowerPoints
Preparing prompts for discussions
Writing course or lesson summaries



Assessment

Designing assessments
Testing assessments
Grading



Services

Agentic AI Tutors
Personalized learning



Risks

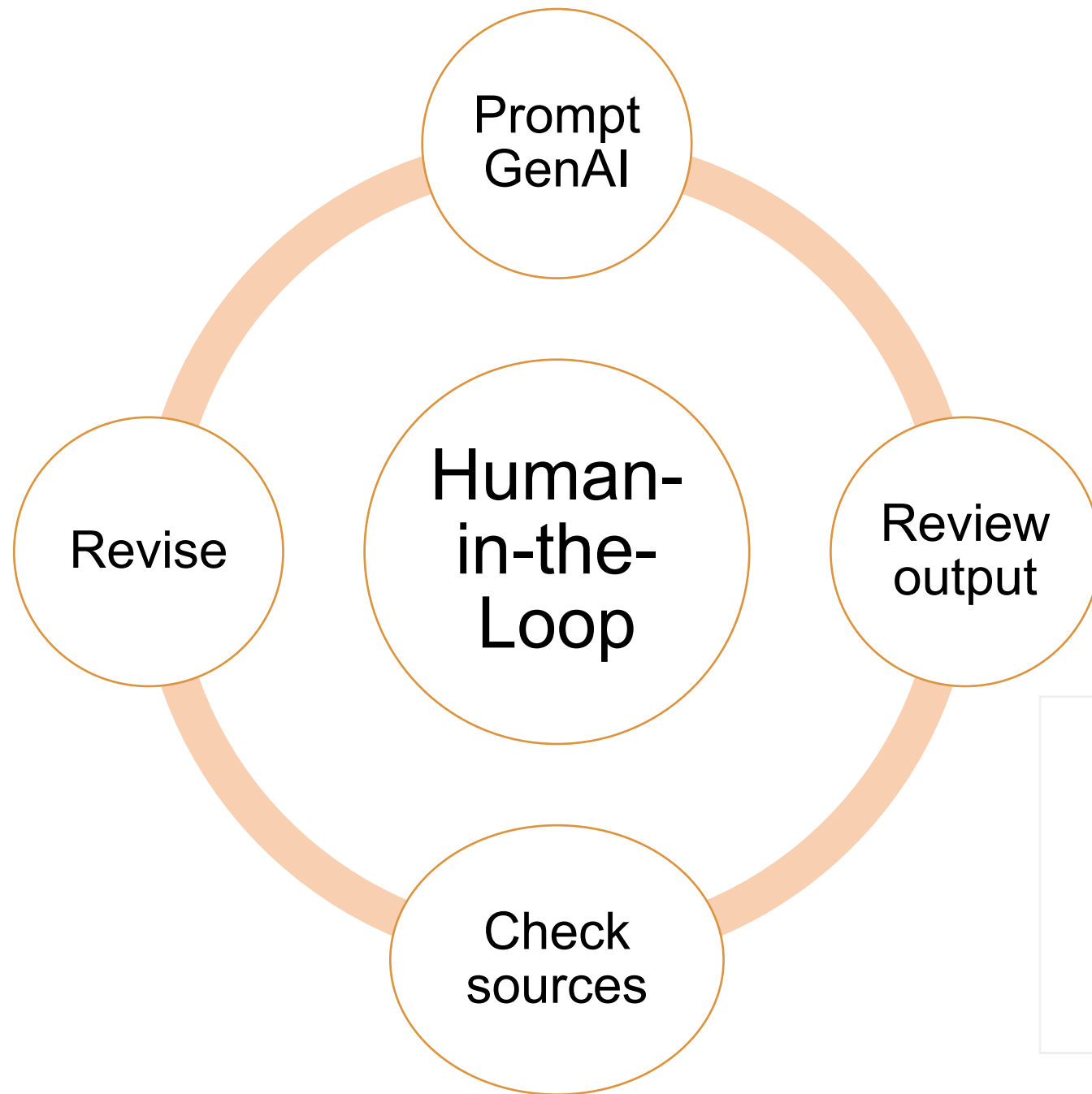
- Using GenAI has several issues:
 - Privacy
 - Cybersecurity (phishing, spam, or other cyberattacks)
 - Harmful content
 - Algorithmic bias (influence of what was used to train the AI)
 - Misinformation
 - Intellectual property and copyright infringement
 - Environmental impact

[Ethical and Privacy Concerns | chatGPT and AI | Center for Teaching and Learning | Brandeis University](#);
[Generative artificial intelligence \(AI\) in education - GOV.UK \(www.gov.uk\)](#); [Guide on the use of generative artificial intelligence - Canada.ca](#)

Copilot generated image, "The dangers of GenAI" (2024)



(Pictures generated by Copilot, 2025)



ALWAYS be the
“human in the loop”
(Mollick, 2024, 52)

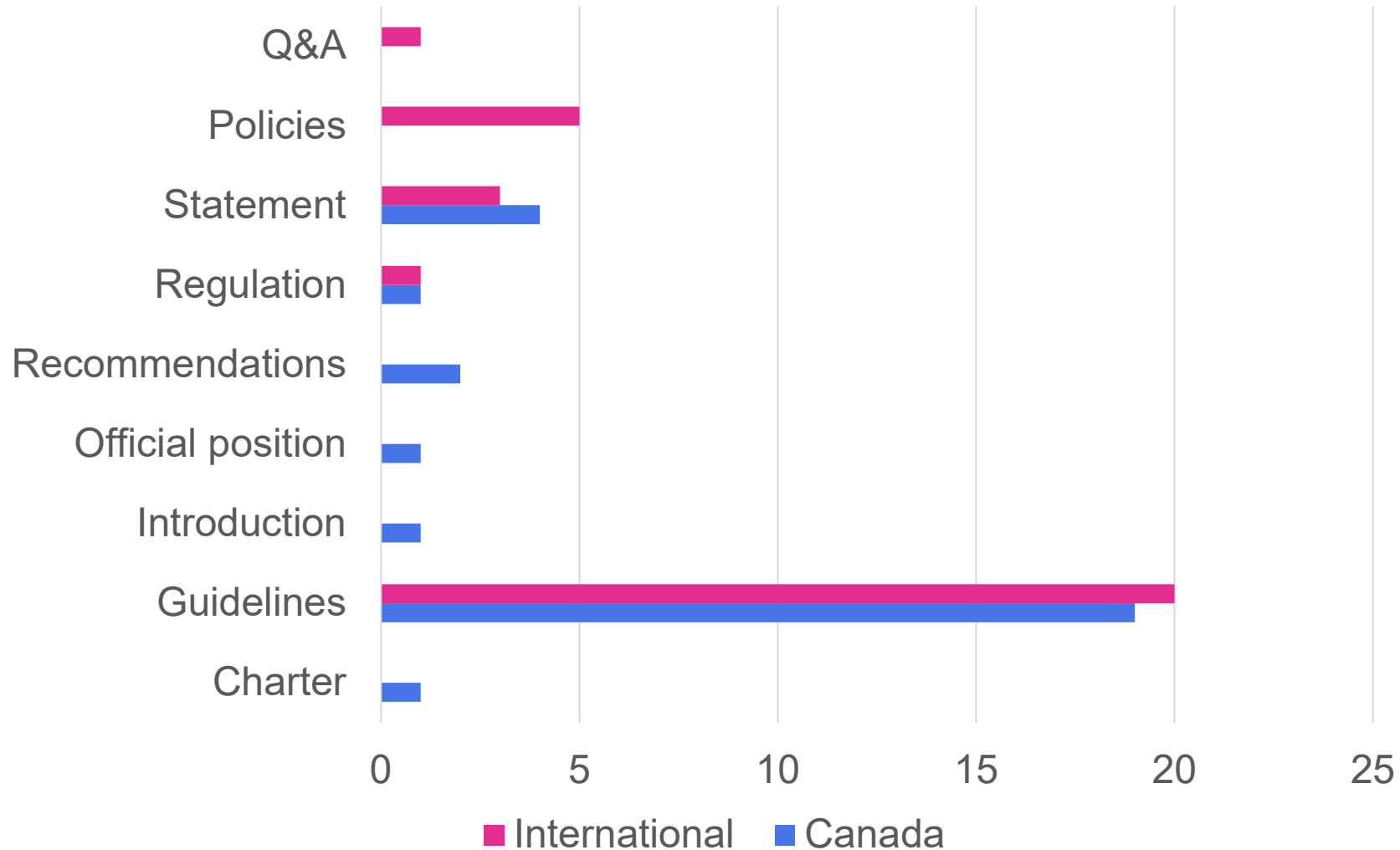
HESA PRESENTS

Observatory on AI Policies in Canadian Post-Secondary Education

GenAI and the Post-Secondary Landscape

[Key resource: AI Observatory | HESA](#)

HESA Snapshot of Institutional GenAI Approaches



- 3 Canadian policies were identified (Oct. 2025) :
 - [Seneca College](#)
 - [Nova Scotia Community College](#)
 - [Norquest College](#)
- Some institutions are including information how already-existing policies and procedures should guide the use of AI (e.g., Carleton, McMaster, and Western universities)

Implement Responsible AI Use Requirements

Environmental Impact

Consider carbon and water footprint of AI tools. Complete risk/benefit analysis and only use AI when clear value outweighs identified risks.

Data Protection

Review all data before input. Never input confidential, personal, or proprietary information without proper safeguards and consent.

Legal Compliance

Ensure compliance with Canadian Copyright Law, PIPEDA, and provincial privacy Acts. Avoid copyright infringement with third-party materials.

Fact Verification

Review all outputs for accuracy. Check for plagiarism, fabricated information, and verify that sources exist and support claims.

Ethical AI Integration

01

Not everyone can afford to pay for GenAI access.

02

Not everyone knows how to use GenAI.

03

AI will not always be as it is today.

A Content- Integrated Model

Content-Integrated AI Learning



Scaffolded, across-the-curriculum approach

Changing the curriculum takes institutional effort

It is not a matter of inserting AI into old content

Requires structural support, systemic change

Three levels

- Macro: Institutional level (Training, co-teaching, advising faculty)
- Meso: Program level (Mapping, defining literacy related learning competencies, iterative approach).
- Micro: Course level.



How could this look for
Engineering courses?

Application

Example: Barriers in the Building Envelope

Outcomes	AI Integration
1.1 List the types of building science barriers	Interactive classification tools: AI can help students categorize barriers (air, moisture, thermal, vapour, weather) using visual recognition or quizzes. Smart flashcards: AI-generated flashcards with adaptive learning based on student performance.
1.2 Discuss the concept of an air barrier	Students can prompt AI to simulate airflow through building assemblies to show how air barriers prevent infiltration/exfiltration.
1.3 Moisture Barriers	Instructors prompt AI to develop case studies using where moisture barriers failed or succeeded, prompting analysis. Instructors can create AI Agents that can answer student questions about air barriers in real time.
1.4 Discuss the concept of a thermal barrier	Students prompt AI to simulate heat transfer through walls with/without thermal barriers.
1.5 Discuss the concept of a vapour barrier	Instructors develop decision-making simulations for students, which walks them through choosing vapour barrier placement based on climate and building use.
1.6 Discuss the concept of a weather barrier	Students prompt AI to walk them through predictive analytics by showing how weather barriers perform under different environmental conditions.
1.7 Problems with Combinations of Barriers	Students prompt AI to analyze building envelope designs and flag potential issues (e.g., trapped moisture). Instructors create virtual labs using AI agents where students can experiment with combinations and see simulated outcomes.

Developed AI literacies

Understanding AI capabilities and limitations

- Recognizing what AI can and cannot do (e.g., simulations vs. real-world testing)
- Understanding the role of data in AI decision-making
- Awareness of AI's reliance on models and assumptions

2. Prompt engineering and communication with AI

- Crafting effective prompts to get accurate and useful responses
- Iterating on prompts to refine outputs
- Understanding how language influences AI behavior

3. Data interpretation and critical thinking

- Interpreting AI-generated data and visualizations
- Evaluating AI outputs critically
- Applying domain knowledge to validate AI insights

How do we use AI to augment student learning?



1. Identify a learning outcome (something students struggle with or tend to use AI to compete)



2. Brainstorm ideas to see how AI could be used to approach the learning outcome. This can include prompting GenAI for ideas.

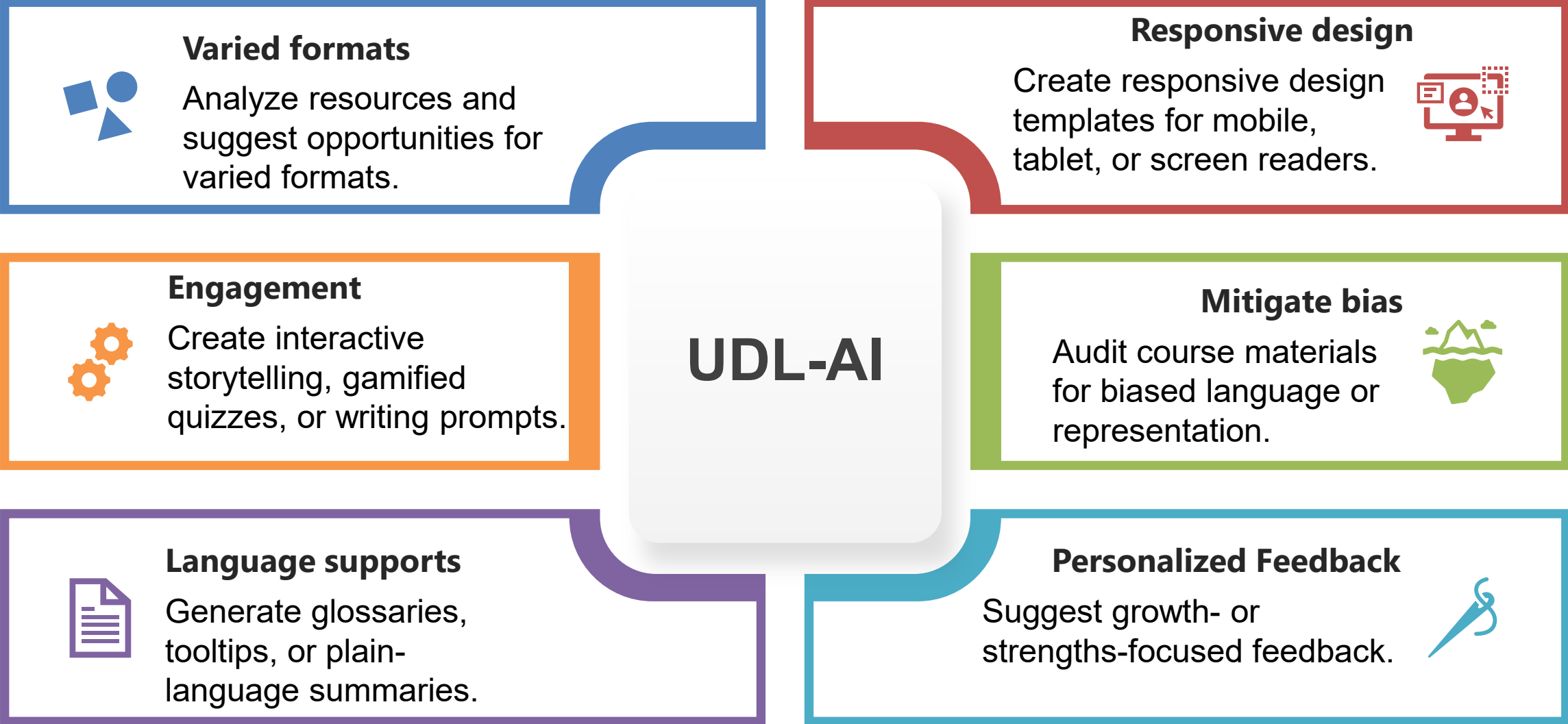


3. Review the generated content to determine its suitability for integration into the course.



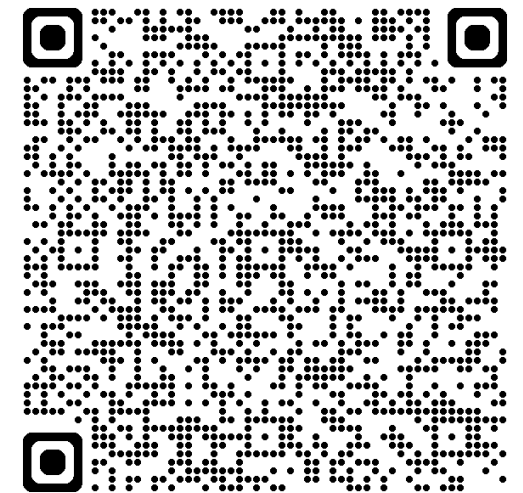
4. Develop lesson plan to operationalize the learning objective.

CIAIL for equitable learning





Feedback?
Suggestions?
Questions?



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How AI was used for this presentation

Extracting examples from datasets
(Gemini, Copilot and Google Notebook LM)

Editing (Grammarly, Spell Check)

Generating examples (Copilot)

Image generation (all generated images are cited;
Copilot)

PowerPoint Designer

Summarizing (Copilot)

Synthesizing research findings and datasets
(Gemini, Copilot and Google Notebook LM)

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AI & Engineering

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