

Critical AI Information Literacy in Academic Research

Skills, Frameworks, and Future Prospects

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Background

In the rapidly evolving landscape of Artificial Intelligence (AI) development, the emergence of Generative AI (GenAI) technologies marks a transformative era. As GenAI becomes increasingly influential and accessible to students and researchers, librarians face new challenges in equipping patrons with the necessary AI Literacy, which is essential for effectively leveraging GenAI in teaching, learning, and research.

Research questions

This research proposes a Critical AI Literacy (CAIL) framework, which is a relativization of AI Literacy, to enhance academic research strategies.

Methods and materials

- Literature Review
- The framework bases on the ALA's Framework for Information Literacy for Higher Education, and other case studies
- Case Study: To use the proposed framework to evaluate the information provided by AI

CAIL Skills

- 1. Advocate for Data Transparency:** AI-literate individuals acknowledge the data transparency in GenAI products, understanding that responsible AI can only be achieved through open data practices.
- 2. Understand Data Sovereignty:** AI-literate individuals are aware of the issues surrounding data sovereignty, which can impact AI use and development and raise concerns about digital colonialism, data exploitation, and the risks of misrepresenting underrepresented languages and cultures in GenAI-sourced materials.
- 3. Consider Environmental Impact:** AI-literate individuals understand that the energy demands of training GenAI models are crucial and aware of the concerns that most current models rely on carbon sources, producing significant CO2 emissions and environmental harm.
- 4. Acknowledge Human Labor in AI Development:** AI-literate individuals understand the concerns about the exploitation of human labor in training and refining GenAI systems and acknowledge that this labor is frequently sourced from the Global South, resulting in one of the aspects of digital colonialism.
- 5. Recognize Bias:** AI-literate individuals recognize the risk of automation bias and therefore should avoid fully trusting AI-generated results in decision-making, remaining aware that these outputs may contain embedded biases and errors. AI-literate individuals should approach AI results critically, understanding that human oversight is essential to mitigate potential inaccuracies.
- 6. Aware of Digital Ableism:** AI-literate individuals are aware of their privilege to be able to access and use GenAI and criticize the Ableism inherent in the design of AI systems.
- 7. Develop Ethical Guidelines:** AI-literate individuals should ensure the ethical use of GenAI, asking critical questions about a GenAI system to determine if it is ethically justifiable.

Results

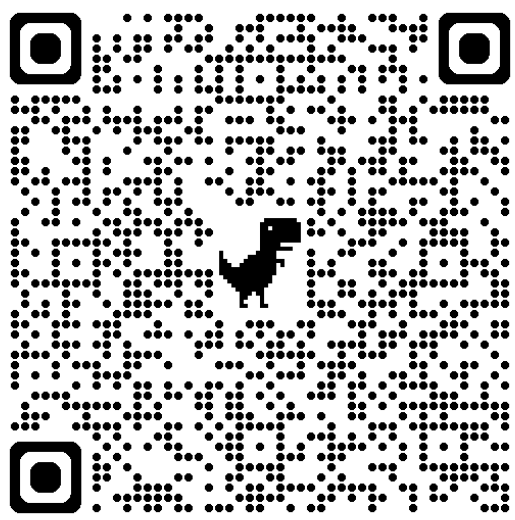
- Proposed CAIL Skills and RACBAC Standard
- CAIL Skills
 - RACBAC Standards

RACBAC Standards

- Standard 1: Relevance** assesses how well GenAI output meets the request's content and depth needs. GenAI learns from its training data, so if a field is underrepresented, the output may be less relevant. Researchers should check if the content and depth align with their request.
- Standard 2: Accuracy** refers to the validity of GenAI-generated content. Due to limitations that can produce false or fabricated information, researchers must approach GenAI outputs cautiously, consistently fact-checking and validating all content.
- Standard 3: Coverage** evaluates if the output is comprehensive and balanced, as training data quality impacts the range and accuracy of AI-generated content. Researchers should examine if areas are underrepresented or omitted, if diverse perspectives are included, and compare results with trusted resources.
- Standard 4: Bias** in GenAI outputs is inherited from its training data. While filters can limit bias, they can't eliminate it. Researchers should critically identify nuanced biases, especially within their expertise, even when not obvious.
- Standard 5: Authority** refers to the academic reliability of sources provided by GenAI. GenAI often generates non-peer-reviewed or non-existent citations. Researchers should always fact-check these references using traditional methods and not rely solely on AI-generated results.
- Standard 6: Currency** refers to the publication dates of materials GenAI provides in bibliographies or reading lists. Researchers should ensure these lists are current and relevant to their work. Be aware that current LLMs can't reliably select materials from specific periods or generate bibliographies based on publication dates. Therefore, scholars should cautiously review AI-generated citations, manually cross-verifying sources using their library research skills.

References

Please scan the **QR code** to review the full references.



Conclusion

Conclusion:

- **Instructor Collaboration is Crucial:** Partnering with instructors who teach CAIL skills and the RACBAC Standard is essential for effectively teaching AI literacy to students and researchers.
- **Librarian-Database Provider Partnerships:** Collaboration between librarians and database providers can expand the information available to generative AI (GenAI) systems. This wider access to information will help GenAI produce more comprehensive and balanced outputs.
- **Integrated Knowledge Ecosystem:** These collaborations will create a more integrated knowledge ecosystem, giving researchers broader access to diverse resources across multiple databases.

Further thoughts:

- **Designing Pedagogical Approaches:** These efforts and practices will inform the design of effective teaching methods for the responsible and critical use of AI in academia.
- **American Library Association AI Literacy Guidelines (Draft, scan the QR code)**



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