

Understanding the Core of LLMs as genAI – **CollectiveGPT** and Human Intelligence

Educational Technology

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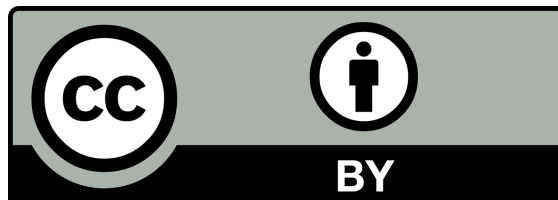
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AI Competency Framework

Why Educator AI Literacy Matters

- UNESCO (2024b) calls for global AI literacy in education
- Teachers must critically evaluate and ethically use genAI

"Teachers are the primary users of AI in education, and they are expected to be the designers and facilitators of students' learning with AI" (UNESCO, 2024b).

Key Areas of AI Literacy (UNESCO, 2024b)

- Three essential competencies
 - Understanding AI
 - Basic concepts, capabilities, and limitations.
 - Ethical and critical thinking
 - Evaluate bias, fairness, and social impact.
 - Pedagogical integration
 - Use AI meaningfully in classroom activities.

Connection to DigComp 2.3 AT (Austria) (Nárosy, 2022)

- 1.2 Critical Evaluation – Assess AI outputs for credibility.
- 2.2 Collaboration – Use AI in shared learning activities.
- Table 10) Applied AI-Specific Competencies: Recognizing the **distinction between human and artificial intelligence (...)**

The Challenge of Teaching AI to Non-CS Teachers

- AI literacy isn't just tech skills
- Many teachers feel
 - *"I don't understand AI"*
 - *"It's a black box"*
 - *"I'm not a computer scientist"*

Long & Magerko (2020) Design Principles

CHI 2020 Paper

CHI 2020, April 25–30, 2020, Honolulu, HI, USA

What is AI Literacy? Competencies and Design Considerations

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ABSTRACT

Artificial intelligence (AI) is becoming increasingly integrated in user-facing technology, but public understanding of these technologies is often limited. There is a need for additional HCI research investigating a) what competencies users need in order to effectively interact with and critically evaluate AI and b) how to design learner-centered AI technologies that foster increased user understanding of AI. This paper takes a step towards realizing both of these goals by providing a concrete definition of *AI literacy* based on existing research. We synthesize a variety of interdisciplinary literature into a set of core competencies of AI literacy and suggest several design considerations to support AI developers and educators in creating learner-centered AI. These competencies and design considerations are organized in a conceptual framework thematically derived from the literature. This paper's contributions can be used to start a conversation about and guide future research on AI literacy within the HCI community.

Author Keywords

AI literacy; AI education; AI for K-12; artificial intelligence; machine learning; computing education

CSS CONCEPTS

- General and reference—Surveys and overviews
- Social and professional topics—Computing literacy
- Computing methodologies—Artificial intelligence

INTRODUCTION

Artificial intelligence is becoming increasingly integrated in user-facing technologies. However, algorithms on common platforms can be opaque to users, who often do not recognize they are interacting with AI [10,54,55]. These misconceptions can limit people's ability to effectively use, collaborate with, and act as critical consumers of AI [57]. Widely held misconceptions about AI can also lead to misdirected regulatory action [124] and public letdown if expectations for development are not met [57].

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Design and education both play a role in contributing to public misunderstandings about AI. Black-box algorithms (i.e. algorithms with obscured inner-workings) can cause misunderstandings about AI [55]. On the other hand—even with more transparent technologies—a lack of technical knowledge on the part of the user can lead to misconceptions [25]. There is a clear need for a better understanding of this space from the perspectives of both learners and designers.

Researchers in the HCI community have begun to address public misconceptions of AI by investigating how people make sense of AI (e.g. [46]) and exploring how to design more understandable technology (e.g. [67]). However, there is a need for additional research investigating what new competencies will be necessary in a future in which AI transforms the way that we communicate, work, and live with each other and with machines. We refer to this set of competencies as *AI literacy*.

Emerging research is exploring how to foster AI literacy in audiences without technical backgrounds. Within the past year, companies have pursued initiatives to broaden AI education to underrepresented audiences in an effort to increase workforce diversity [5,148], educators have published guides on how to incorporate AI into K-12 curricula [145], and researchers are exploring how to engage young learners in creative programming activities involving AI [45,79,132,146,149]. The “AI for K12” working group is currently developing a set of standards for K-12 classrooms to determine what each grade band should know about AI [130]. The group has also identified five “big ideas” of AI to guide the standards development: 1) “Computers perceive the world using sensors”; 2) “Agents maintain models/representations of the world and use them for reasoning”; 3) “Computers can learn from data”; 4) “Making agents interact with humans is a substantial challenge for AI developers”; and 5) “AI applications can impact society in both positive and negative ways” [130].

The five “big ideas” of AI provide a strong foundation for future research on fostering AI literacy. However, most of the research on AI education for non-technical learners has just been published within the last year. In contrast, AI as a field has been active since the 1950s, and there is a variety of existing research (scattered across disciplines and venues) that could contribute to understanding what competencies should be included in a definition of AI literacy and how to better design educational experiences that foster AI literacy.

Long & Magerko (2020) Design Principles

#	Principle	How We Applied It
1	Explainability	Visuals + vector space chart
2	Embodied Interaction	Participants act as the AI predicting next word
3	Contextualizing Data	City/village context switch
4	Promote Transparency	Strudelcity prompt injection, reveal manipulation
5	Gradual Unveiling	Participants don't know until phase 4 that answers are influenced
6	Opportunities to Program	Fill-in-the-blank, suitable for non-CS educators

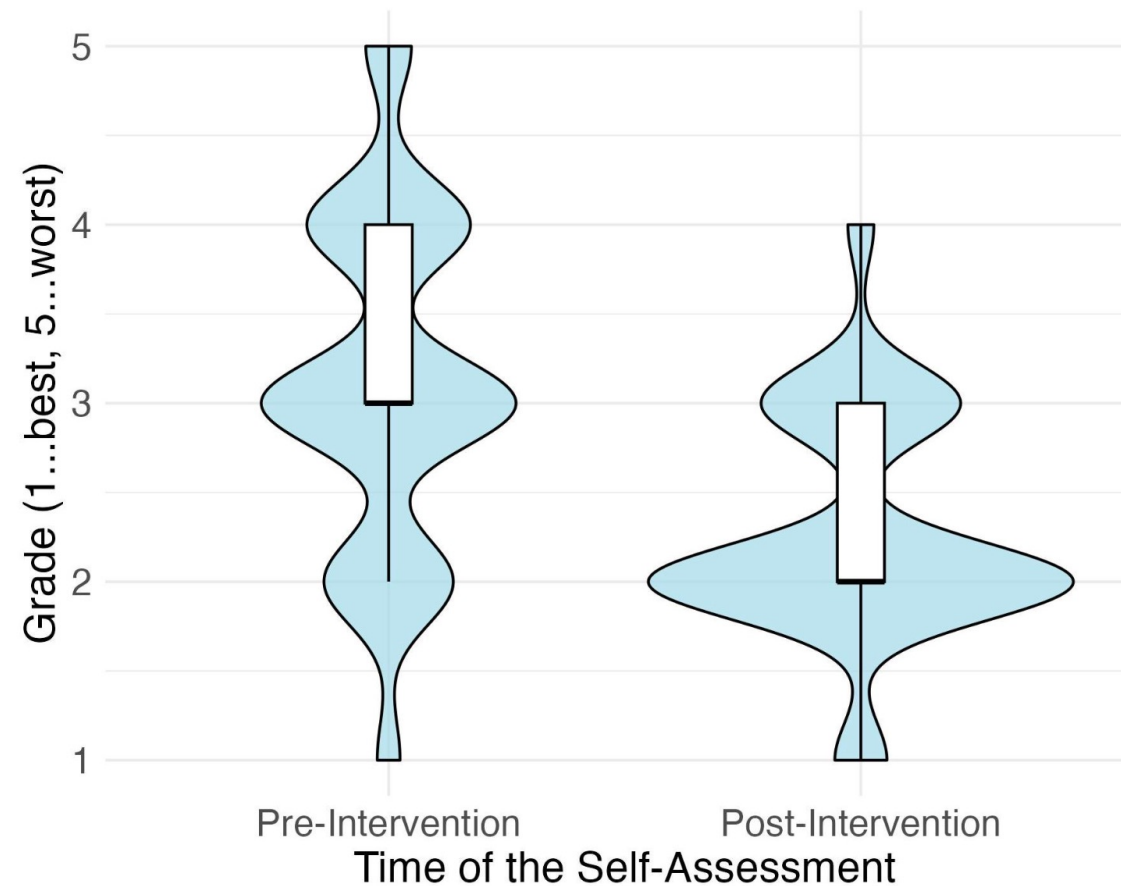
Long & Magerko (2020) Design Principles

#	Principle	How We Applied It
7	Critical Thinking	manipulation section
9	Identity, Values & Background	Eye color example
11	Social Interaction	CollectiveGPT + group discussions
12	Leveraging Interests	Proverb, fairy tale, school context prompts
15	Low Barrier to Entry	Easy-access, 1-hour format

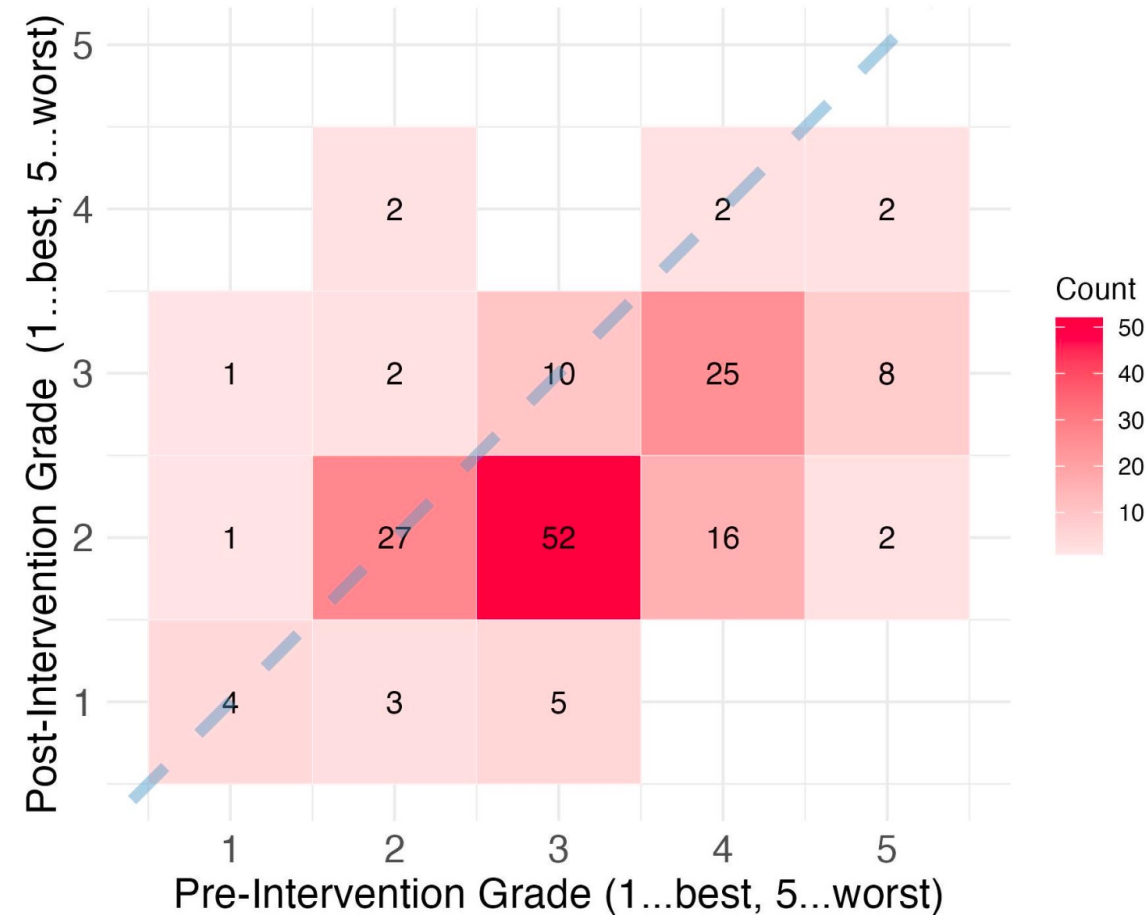
Why This Works for **all** Teachers

- Design for inclusion
 - Avoids complex math or coding
 - Relatable prompts (fairy tales, city names)
 - Reveals genAI's inner logic without requiring technical knowledge

Grades: pre- vs post-intervention (N = 162) from Br  nner et al. (2025)



Grade transitions (N = 162) from Br  nner et al. (2025)



Discussion

echoQuiz

<https://echq.eu/2536>



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