WHAT CREATIVE LITERACIES CAN AI OFFER? PERCEPTIONS AND PROTOTYPES FROM P-12 TEACHERS

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ABSTRACT

In the context of artificial intelligence (AI) as an increasingly pervasive technology, emerging research has addressed teachers' unmet needs in knowing and using AI tools for equitable teaching and learning. Framed by culturally responsive computing, the research project explores the AI learning perceptions and prototypes of a group of P-12 teachers from NYC public schools. Data sources of the study include a course survey on AI perceptions and learning, teachers' AI prototypes, AI-integrated lesson plans, and teachers' reflections on AI usage in the classroom. Findings of the study contribute to the research and practice on P-12 teachers' AI literacies as well as their perceptions on creative AI uses for teaching and learning. Findings further inform preservice teacher education in responding to AI applications for equity and inclusivity.

BACKGROUND

Witnessing AI's pervasive development that expands the current landscape for teaching and learning (U.S. Department of Education, 2023), emerging research has begun to address P-12 preservice and in-service teachers' perceptions of learning AI (Antonenko & Abramowitz, 2023; Chiu & Chai, 2020; Dai et al., 2020; Lee, at al.; Yang & Appleget, 2024). These studies indicate that a well-designed curriculum plays an important role in motivating students' learning and well-being in using AI. Further, teachers' professional development in AI beyond the traditional information-technology curriculum needs to be addressed. Currently, there is a scarcity of pedagogical understanding for the integration of AI literacies in P-12 schooling and how to teach AI meaningfully and equitably for school children (Sun, et al., 2023). While public school systems including NYC and Seattle have recently opened up Generative AI such as magicschool.ai for teaching, there is an urgency to explore, empower, and examine how teachers practice and perceive AI literacies when they are engaged in teaching AI to contribute to this effort.

RESEARCH QUESTIONS

(1) How do P-12 teachers practice AI literacies in school curricula?
   a. How do teachers use AI in and beyond curriculum planning?
   b. How do they tinker with AI across disciplines?
   c. How do they practice AI literacies for equitable, creative teaching and learning?

(2) How do P-12 teachers perceive AI through their own teaching and learning?
   a. What are the opportunities and challenges perceived by teachers after using a variety of AI tools?
   b. How do teachers perceive using AI literacies for diversity and inclusivity based on their practices?
   c. How do teachers perceive responsible AI use in the classroom?

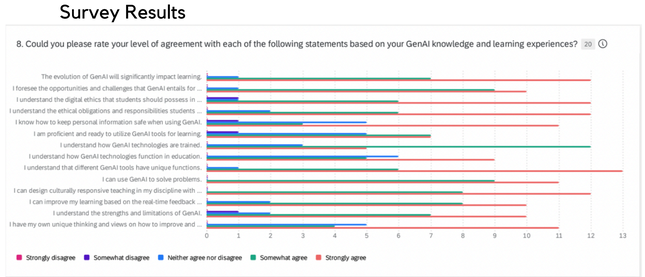
THEORETICAL FRAMEWORK

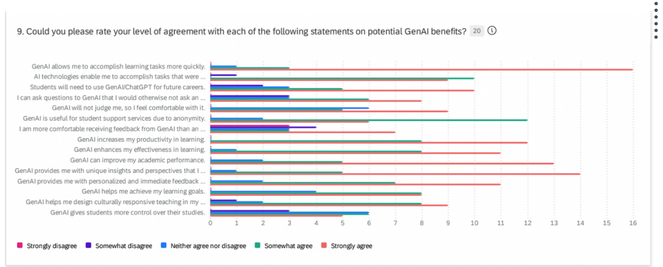
The research is rooted in strength-based equity pedagogies in teacher education (Gay, 2018; Ladson-Billings, 2014; Paris & Alim, 2012). Particularly inspired by Papert's (2020) theory in creative learning and Ladson-Billings's (2014) equity pedagogy in education, the researchers aim to expand the initial framework of culturally responsive computing (Madkins, et al., 2020; Scott & White, 2013). In this framing, educational computing needs to be enacted meaningfully in connection to individual students' prior (computing) knowledge and experiences. The study further draws on sociocultural theories of multimodality and digital literacies (Lankshear & Knobel, 2008; Kress & van Leeuwen, 2001; Siegel, 2006) to illuminate the dynamic and culturally varied quality of coding practices of participants. The sociocultural perspective views literacy as situated practices (Street, 1997) and meaning-making as multimodal symbol-making across a multiplicity of semiotic modes (Kress & van Leeuwen, 2001; Siegel, 2006); digital literacies represent situated practices mediated by digital symbolic resources (Lankshear & Knobel, 2008). The framework provides theoretical constructs and analytical tools for the study.

DATA & METHODS

The study was conducted as part of a summer professional development program for NYC in-service teachers that lasted for one month, participated by two faculty members and 24 P-12 NYC public school teachers from diverse racial, ethnic, linguistic, and technological backgrounds. The collected data included a qualitative survey delivered upon program exit to understand P-12 teachers' perceptions and prototypes of AI tools for teaching and learning as part of their course experiences. In addition to the survey data, the research project includes the following data sources: 1) teachers' in-class, published multimodal prototypes via generative AI tools; 2) teachers' written analysis of their own and peers' prototypes on Padlet; 3) teachers' written comments toward their own and peers' GTM prototypes; 4) teachers' published AI-assisted lesson plans and rubrics on Padlet; and 5) teachers' final written reflections on their perceptions and course experiences in using computational literacies for teaching and learning, including AI.

Examples of
Survey Results



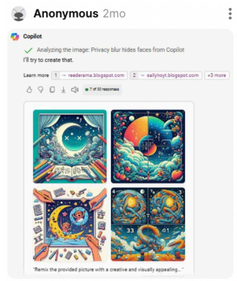


RESULTS

Initial data analysis demonstrate teachers' confidence in using Generative AI tools in their classrooms and their tendency of viewing AI literacies as an assistant for teaching and learning. Teacher prototypes across AI platforms present how teachers could use AI for teaching assistance, such as generating first-draft rubrics and teaching ideas. Findings further indicate in-service teachers' different levels of integrating computational multimodalities, positive acceptance, as well as culturally relevant/sustaining practices through their AI prototypes, pointing to the need for teacher educators and teachers to co-develop explicit culturally-responsive computing, including responsible AI classroom usage, for multicultural and multilingual literacy learning in the P-20 classroom.

A CLOSE LOOK AT TEACHERS' GENERATIVE AI PROTOTYPES

1. Generative AI can be a multimodal assistant with limitations.



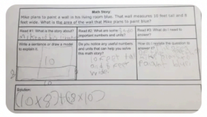
Anonymous 2mo

Kenia

I wanted GPT4 to remix a picture of a math story to modify the math problem even further to help students to understand and solve, but it provided the picture above.

1 3

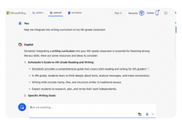
Anonymous 2mo



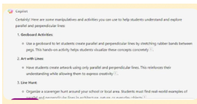
This is the math story

Anonymous 2mo

I like that I was able to use my voice, write, post pictures to ask for what I want; however, the information that it provided was so much that I get lost just trying to follow it. I would a prefer a more straight to the point response as opposed to a lengthy list.



Seimary- Might not be 100% familiar with specific teachig curriculums and just gave genral information.



Glow: I am a special education Teacher for grades 9-12. The access/buying into our lessons are based on cultural relevance and manipulatives. I asked the Copilot about cultural relevant topics for a geometry lesson on circles and it gave me a plethora of great ideas, I can use on hard geometry topics. As well as some manipulatives, I can use in the lesson on perpendicular lines. Overall, I like the suggestions provided to me by Copilot, I see why people are gravitating to AI generative software.
Grow: To some viewers, it may be a overload of information, maybe that can have a button that said see more or would you like more information on this topic.

1 1

Ting Yuan 2mo

"for some users, it gives a visual overload..."

Anonymous 2mo

Robert, I asked, if the chat can share a grade 6 New York state science curriculum map

0 2

Elaine Marcelle 2mo

This is great for new teachers who has to create a curriculum map from scratch. They can have a great layout and make necessary changes to it.

Anonymous 2mo

Zebo: That's great to know. I am working on curriculum map this summer for ENL so this will come in handy.

2. Generative AI can generate creative literacies for teaching and learning.

suno.com

Atomic Love Song by @echoingsuperstars732 | Suno

Jiayi
I created a chemistry song, but the lyrics don't quite match the prompt. Prompt: "Create a country-style song related to the atomic theory."
I found that we could modify the lyrics, which can be helpful in certain ways for students.

0 1

Ting Yuan 2mo

Great trial. The song in my tinkering did not meet my expectations. I wonder if I need to go to the custom mode to add more details.

suno.com

Triangle Area Tune by @expressionlesssongwriter828 | Suno

Prompt: create a song to help my students with finding the area of a triangle

My students really struggled this year to find the area of a triangle. Even when given the formula, they still forgot to divide it in half.

This is a really fun way to have students memorize the steps by listening to the song. I would definitely use this in my real classroom!

1 1

Rolla Khass 2mo

This is a catchy song!! This would be enjoyable for them, I hope you find a way to share this with them

Add comment

suno.com

Sentence Fun by @bohemianfilmscore538 | Suno

Yasmin- I prompted suno tpo create a song for elementary school students related to parts of a sentence. It created 2 different songs with the same lyrics
[Verse] Words come together
In lines they play
Building up a sentence
Every single day
[Verse 2] Nouns and verbs unite
Adjectives so bright
Prepositions guiding
In the morning light
[Chorus] Parts of a sentence
We learn and sing
Every word has meaning
Makes our hearts ring
[Bridge] Subject is the star
Predicate not far
Join them with a verb
And you'll go real far
[Verse 3] Adverbs tell us how
When and where and why
Articles are tiny
But they reach the sky
[Verse 4] Conjunctions hold hands
Putting words in bands
Sentences come alive
When we understand

0 1

Ting Yuan 2mo

This looks fun!

John-Playing with AI Mash Ups

Turn ideas into videos | AI video creator | invideo AI

There is a limit to what this program can do. I wanted to see two extremes come together. I tried mashing Rough Rider's Anthem rap song with Vivaldi's 4 Seasons as the instrumental music. In addition I requested that Sesame Street characters are the ones speaking the lyrics. I may have requested too much for this to handle in my first query. There is very little music, there is a documentary of a video and a monotone voice talking about what it could potentially be like. I will attempt again with just the mashing of two songs and see what results. Students will grow tiresome of a robotic voice really quickly if that is the only results this program generates. There is a lag and a wait in the que. Hopefully the timing is quicker as well.

NEXT STEP

1. Data visualization & analysis
2. Ways of data presentation?