



Artificial Intelligence and Early Childhood Special Education

ECiDC Summer Institute
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Disclaimer: The contents of this presentation were developed by the presenters under award #H327F200008. They do not represent the policy of the Department of Education. Do not assume endorsement by the Federal Government.

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Quick Introductions...




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Center for Innovation, Design, and Digital Learning (CIDDL)




Learn more at CIDDL.org



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The **Center for Innovation, Design, and Digital Learning (CIDDL)** serves as the National Center to Improve Faculty Capacity to Use Educational Technology in Special Education, Early Intervention, and Related Services Personnel Preparation and Leadership Personnel Preparation Programs.



Learn more at <https://ciddl.org/>


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CIDDL is Focused on...

- Increasing knowledge, adoption, and use of a range of educational technologies
- Increasing capacity of faculty at institutions of higher education (IHE) to use a range of educational technologies in educator, related service, or leadership preparation program
- Hosting a professional learning network <https://community.ciddl.org/>
- Supporting a **CIDDL Tech Alliance** consisting of 10 universities (Supplement 2023/2024)

Learn more at [CIDDL.org](https://ciddl.org/)




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Inclusive Intelligence:
The Impact of AI on Education for All Learners

Introduction

- Chapter 1: Considering Artificial Intelligence in Higher Education
- Chapter 2: Teacher Practices and AI Assessment
- Chapter 3: Using AI in the Classroom: Considerations for Educators
- Chapter 4: Envisioning AI's Impact on Special Education Research
- Chapter 5: Enhancing the School-Home Connection: Empowering Parents with AI
- Chapter 6: Policy and Guidance Considerations for AI in Supporting SWDs
- Chapter 7: Industry Collaboration for Educators and AI
- Chapter 8: Ethical Considerations for Educators Leveraging AI



<https://ciddl.org/inclusive-intelligence-the-impact-of-ai-on-education-for-all-learners/>

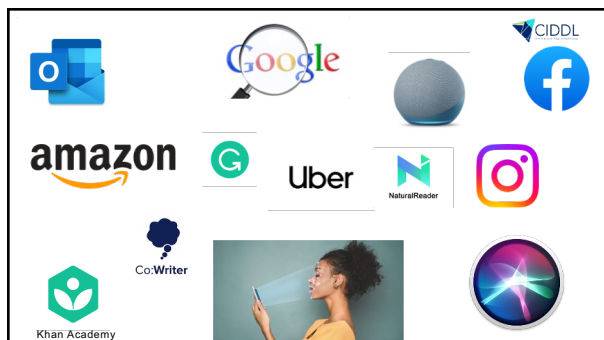



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What is AI? How have you used it?



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Artificial Intelligence (AI)



The simulation of human intelligence processes by machines. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions), and self-correction. AI can personalize learning experiences, automate administrative tasks, and new types of technology solutions.

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Terms

Machine Learning (ML): A broad sub-category of AI that is focused on helping machines answer questions or make predictions. **Examples:** YouTube or Amazon suggestions.

Generative AI: Refers to artificial intelligence systems that can create original content, such as text, images, music, or even code, often based on patterns learned from existing data. These systems can be used to generate new ideas, automate tasks, personalize learning experiences, and even simulate realistic scenarios. **Examples:** Any large language model (LLM).

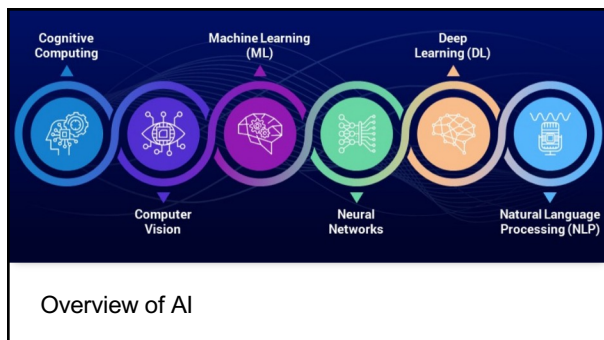
Large Language Models (LLM): A subcategory of machine learning that are trained and focused on human language. **Examples:** Chat-GPT, Gemini, etc.

Large Action Model (LAM): A type of generative AI system that goes beyond creating content. It is designed to understand complex tasks, make decisions, and even take actions based on the intent behind human input. LAMs can translate natural language into concrete actions, automating tasks and enabling AI to be more proactive in assisting users. **Examples:** Autonomous car, announced iOS

Artificial General Intelligence (AGI): An AI that at least equals humans in completing tasks across multiple domains, can reason, continues to learn, and self-adjusts. Also called "strong AI", is continually debated, and somewhat hypothetical. **Examples:** None.



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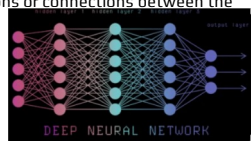
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Large Language Models (LLM)

Ashish Vaswani et al. (2017). [Attention is all you need](#). Proceedings of the 31st International Conference on Neural Information Processing Systems. Team at google brain introduces transformer architecture for large language models with attention mechanism.

Parameters - Think of as individual neurons or connections between the neurons.

- Human Brain = 86 billion
- Chat GPT 3 = 175 billion
- Training data: 500 billion words



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Potential Impact

AI Supporting ALL Students

- Improved and easier **accessibility** of educational materials
- Greater personalization (**individualization**) across education, for all students
- More **holistic** supports for students and families (e.g., interconnected service support across domains)
- Increased and novel **measurement** (e.g., multimodal learning analytics)
- Increased **just-in-time** support based on student need
- More efficient **workflows** for professionals serving students
- Continuous **home** and school support (e.g., intelligent agents)
- Greater potential for inclusive learning and life **outcomes**

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Evolving Concerns


AI Supporting ALL Students

- **Ongoing** technical and humanist concerns (e.g., safety, bias, transparency)
- Lack of school personnel **prepared** to use technology effectively (especially AI)
- Lack of trained researchers and funding to conduct necessary **research and thought leadership** to support AI integration
- Research funding and cycles that **slow** or make AI research nearly impossible
- Lack of **research-based** guidance educators in support of students and families
- **Outdated** standards focused on preparing students for today, rather than the future
- Inconsistent focus on digital, information, and AI literacy in **schools**
- Unprepared citizenry and workforce for new ways of thinking and working **with** digital tools as **co-pilots**

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Pause and Reflect

- What are your initial thoughts on AI in EI/ECSE:
 - Research
 - Pre-service training
 - Professional service
 - Educator/professional use
 - Caregiver/family use
 - Children's use



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Spring 2024 Data (National)

- Students (71%) and Teachers (64%) agree that AI powered learning platforms would be **helpful**
- 28% of teachers report they have **experimented** with Generative AI
- 34% of students report that they use AI tools **regularly** outside of school
- Initial data shows **no significant increase** in cheating behaviors since generative AI tools hit the open market roughly 600 days ago
- Most research in this area is still in its early stages, with **limited** large-scale deployments and studies
- AI **experiments** need to be readily available to address limitations of some large language models and training tools
- Needed work to address **intellectual property** of teachers and students

Project Tomorrow State of Gen AI Usage, Values and Aspirations National Findings and Insights (June, 2024, 2500+ participants), AI-for-education.org trainings (2024, 500+ participants) Lee, et al (2024) <https://doi.org/10.1016/j.caeai.2024.10.025>

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Initial Data

AI and Teacher Training

Teacher Preparation Faculty current knowledge level
Generative Artificial Intelligence

- 56.9% Low to None
- 7% Expert to High

Teacher Preparation Faculty competence in engaging pre-service on AI in Assistive Technologies

- 65.5% Low to None
- <9% Expert to High

CIDDL Tech Alliance Needs Assessment (Fall 2023)

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preK12 Teachers Interest in AI

PreK12 Teacher Challenges Concerning AI

- Finding the **time** to learn how to use AI effectively in my classroom (56%)
- Shaping student **mindsets** to consider AI a learning partner rather than just a quick way to complete assignments (48%)
- Guiding students on **ethical** and appropriate use of AI in students work (54%)
- Addressing the issues of **plagiarism** in student uses of AI (54%)
- Addressing the potential **bias** in student use of AI (26%)
- Maintaining **data privacy and security** as AI-enabled produced are implemented in classrooms (31%)

CIDDL K-12 AI Needs Assessment (Spring 2024)

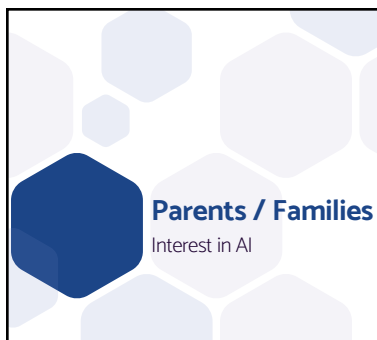
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Themes from PreK-12 Teacher Feedback

- Teachers are worried that AI will hinder students' **problem-solving and critical thinking** skills.
- Many responses highlight concerns about the **ethical use** of AI, particularly regarding data privacy and ownership of AI-generated content.
- A significant number of teachers emphasize the need for proper **training** on how to use AI in the classroom.
- They suggest that AI can be a **helpful** tool for specific tasks like lesson planning, generating ideas, and administrative work, but caution against its overuse.
- A few teachers see AI as a valuable resource for enhancing education, such as assisting with **differentiated instruction and supporting special education**.
- Many responses reflect skepticism and **uncertainty** about the role of AI in education.

CIDDL K-12 AI Needs Assessment (Spring 2024)

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Parents and families are interested in learning more about the following AI topics

- A basic **introduction** to AI (42%)
- **Technical** aspects of AI (42%)
- How to teach my child to use **AI responsibly** as they learn (78%)
- Potential **benefits** of AI to my child in their learning (66%)
- How to prepare my child for AI use in the **workforce** (52%)
- **Issues** to watch for related to the use of AI (e.g., bias, misinformation, security, privacy, etc.) (81%)

CIDDL K-12 AI Needs Assessment (Spring 2024)

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Themes from Parent Feedback

- Many parents believe **AI literacy** should be integrated into the curriculum to prepare students for future use.
- A significant concern is that AI should **not replace the human connection** in education, particularly at the elementary and middle school levels.
- Some responses highlight potential **benefits** of AI, such as aiding in brainstorming, creating summaries, drafting emails, and generating interactive lesson plans.
- Some parents prefer a **cautious** approach, suggesting that AI should be tested and evaluated thoroughly before widespread implementation.
- There are calls for **classes** on AI ethics, safety measures, and responsible use to ensure students understand both the **benefits and potential dangers** of AI.

CIDDL K-12 AI Needs Assessment (Spring 2024)

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Pause and Reflect

- How can we use these data to support pre-service educator preparation?
 - Part C services
 - Part B services
 - Supporting caregivers across the EI/ECSE experiences and transitions



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12 States providing guidance


Arizona, California, Kentucky, Mississippi, North Carolina, Ohio, Oklahoma, Oregon, Utah, Virginia, Washington, West Virginia



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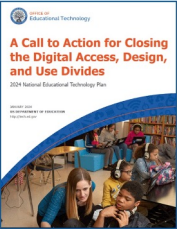
Policy and Guidance

- UNESCO frameworks and tools (AI readiness)
- Communicated AI strategy (Canada first in 2017)
- U.S. Office of Educational Technology Guidance
- UK Policy Discovery sessions (2023)
- Health Care Industry Models (global digital health transformation: open standards, technologies, architectures and content)
- Australia national framework for AI in schools
- Focus on equitable AI, "*born accessible and inclusive*"




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National Educational Technology Plan (NETP) 2024



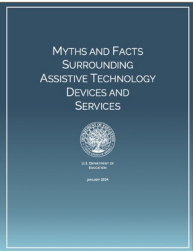
- Released January 22, 2024
- Focus on All Learners, including students with disabilities
- Accessibility and Universal Design for Learning (UDL) throughout the document.
- Highlights:
 - Digital Use Divide
 - Digital Design Divide
 - Digital Access Divide



<https://tech.ed.gov/netp/>


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OSEP: Assistive Technology Guidance




- Released January 22, 2024 along with NETP.
- Dear Colleague Letter
- Myths Surrounding Assistive Technology Devices And Services

<https://sites.ed.gov/idea/idea-files/at-guidance/>





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White House Executive Order



- Released October 30, 2023
- Defines terms
- Covers human implications related to access, privacy, workforce, and education.
- Some Breakdown:
 - **Disability:** 2 mentions, in Sec. 7. Advancing Equity and Civil Rights
 - **Education:** 15 mentions, primarily in Sec. 8 Protecting Consumers, Patients, Passengers, and Students.
 - **Special Education:** No mentions
 - **Rural Education:** No mentions!
 - **Other mentions:** Department of Defense (7), National Science Foundation (15)

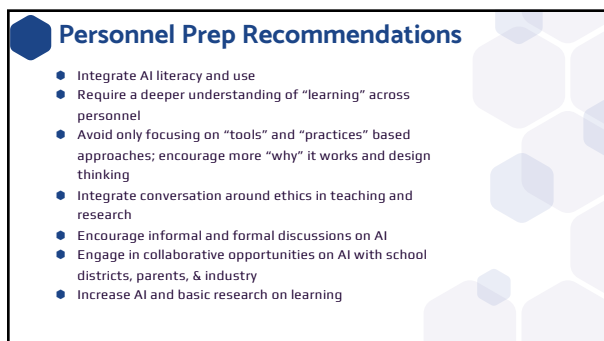
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Pause and Reflect

Think about a course you are going to teach/you have taught previously:

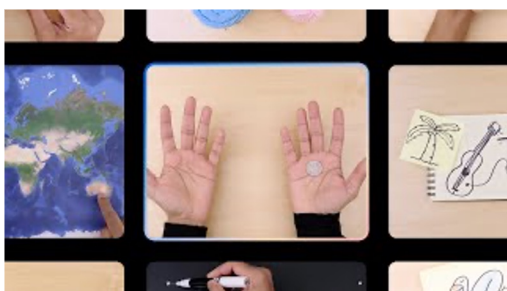
- How could AI be used to support your instruction?
- What is one assignment/experience/activity in which students could explore how AI could be utilized in their professional practice?



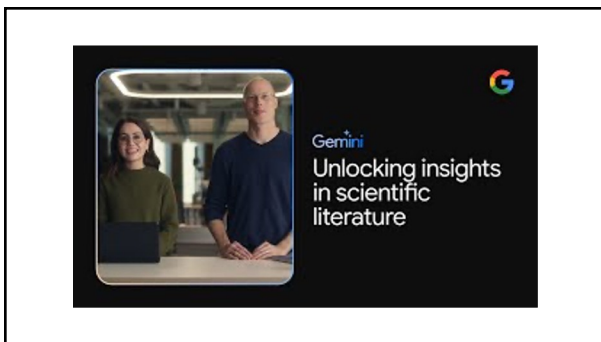
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Exploration of AI in EI/ECSE

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Zero to Three, NAEYC, DEC Guidance



Developmentally Appropriate Practice

"the uses of technology and media by children are active, hands-on, engaging, and empowering... [the uses] become normal and transparent—the child or the educator is focused on the activity or exploration itself, not the technology."

NAEYC (2022)

Winter 2023
Special issue

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Research Literature

The slide displays two research abstracts. The first abstract is titled "Artificial intelligence in early childhood education: A survey review" by Aifeng He and Weiqing Tang. The second abstract is titled "Artificial Intelligence (AI) Literacy in Early Childhood Education: The Challenge and Opportunities" by Aifeng He, Jinyi Tan, Guoqing Xue, and Weiqing Tang. Both abstracts are from the journal "Computers and Education: Artificial Intelligence".

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CIDDL Community and Tech Alliance

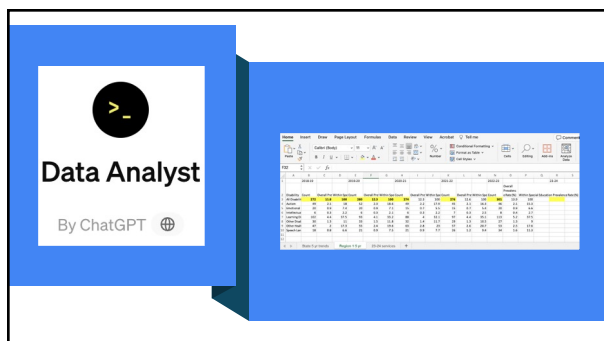
The slide features a group photograph of approximately 20 people, likely members of the CIDDL Community and Tech Alliance, posing in a modern, brightly lit space. To the right of the photo is a QR code that likely links to the community's website or resources.

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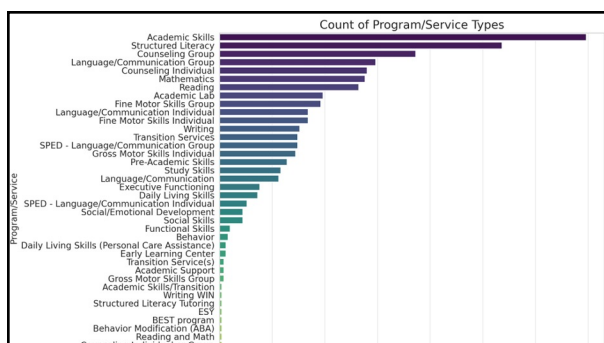
AI and Your Research

The slide has a decorative background with light blue hexagons of various sizes. A prominent dark blue hexagon is on the left side. The text "AI and Your Research" is centered in a dark blue font.

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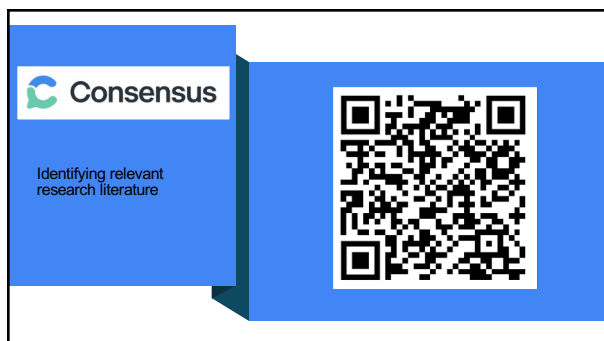
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Provider	Total Minutes/Week	Necessar
BCBA/BT	7,785.00	
OT	2,444.29	
PT	803.86	
Para/BT	10,523.13	
Reading interventionist / Spec Ed teacher	35,902.02	
SLP	7,107.50	
SSW/School Psych	12,439.04	
Spec Ed teacher/para	156,079.90	
Special Ed teacher / Transition counselor	16,799.17	

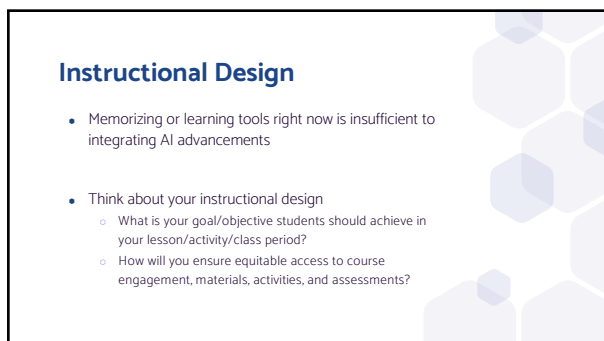
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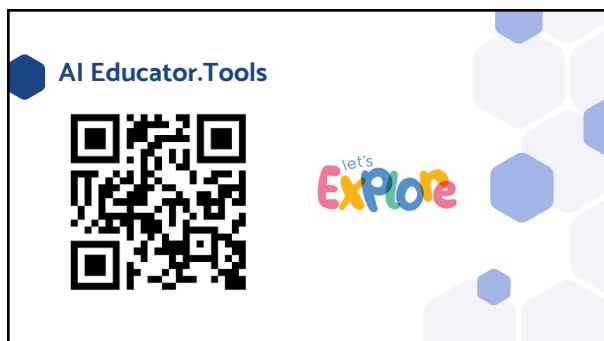
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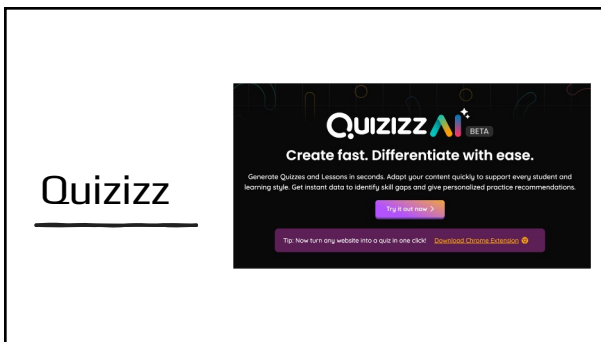
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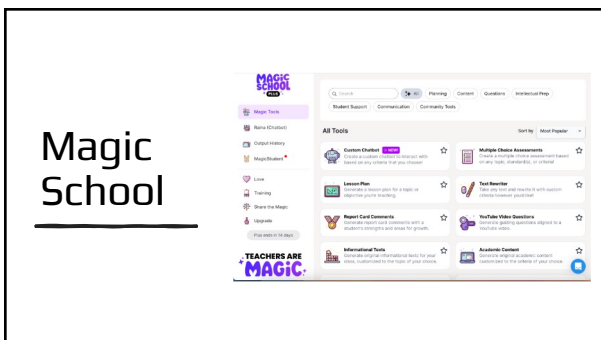
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Image Generation

- Tools: [Dalle-3](#), [Canva's Magic Media](#)
- Why:
 - Visuals enhance engagement
 - Finding perfect graphics can be time consuming
 - Sharing AI image creation tools with pre-service teachers prepares them to implement
- Drawbacks:
 - Images aren't perfect, extra limbs, things that don't make sense, etc.

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Taking the next step
Join the community of folks exploring AI in educator preparation and special education research
