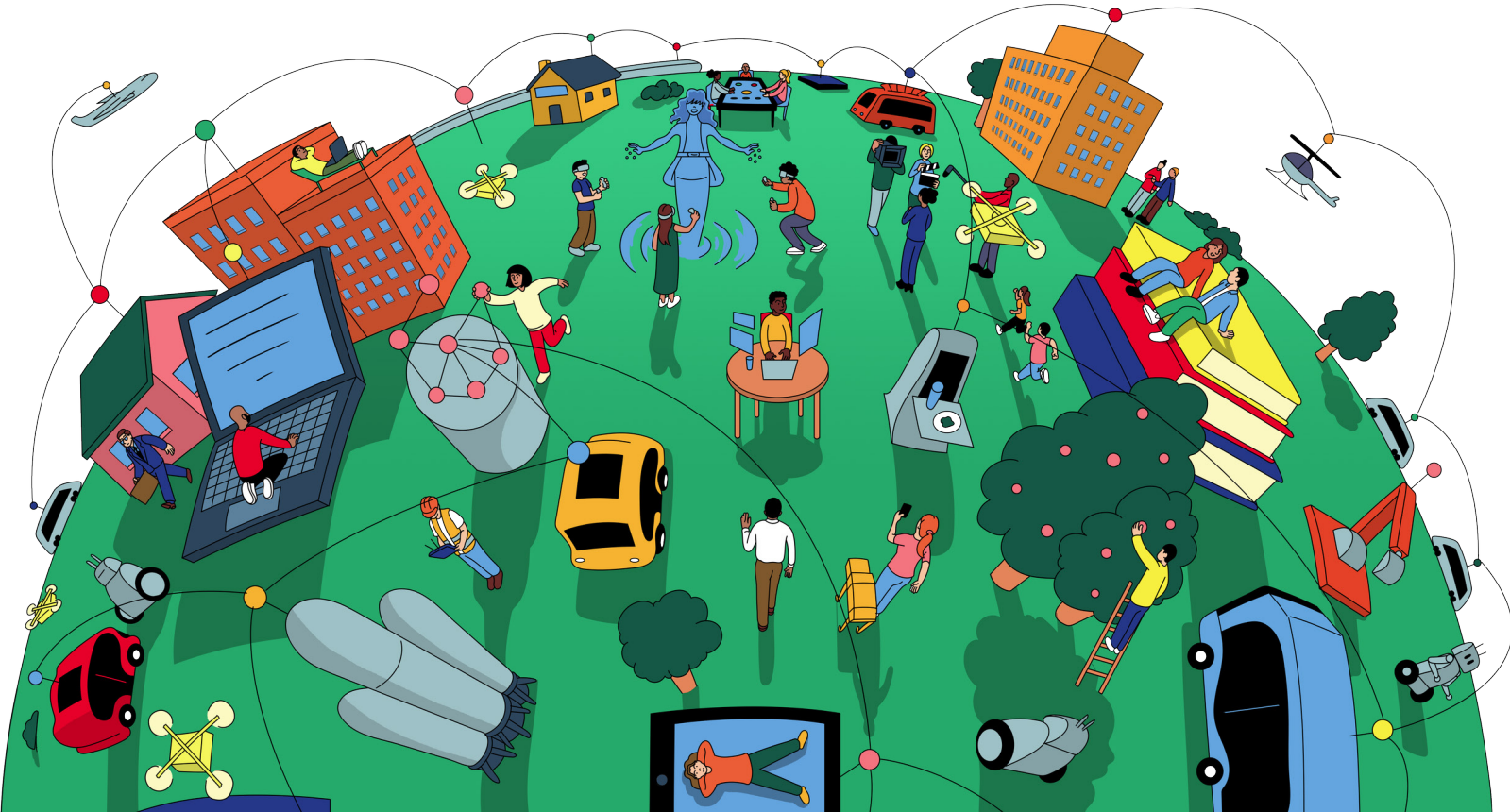




AI Readiness Framework

What Students, Educators and District Leaders need to know



AI Readiness Framework

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Overview

Artificial Intelligence (AI) is already an inescapable part of our world, our economy, and our K12 education system. And we are only at the dawn — the transformation underway will redefine the essential skills needed for America’s students to compete and keep up in a rapidly shifting workforce (Jump, Bradley, 2024, Mossavar-Rahmani, 2024).

With AI used in multiple facets of our lives, and the known examples of AI tools perpetuating systemic bias (Broussard, 2023), the global environmental impact of AI (Brookings Institute, 2024), and the increased risks with misinformation (World Economic Forum, 2024), it is imperative to prepare our students for this dynamic world. We believe that students must build AI literacy and readiness skills that will help them thrive in a constantly evolving future landscape.

AI Literacy

The collection of skills and knowledge that a person needs to confidently understand, ethically use, and critically evaluate artificial intelligence in a world where AI is ubiquitous.

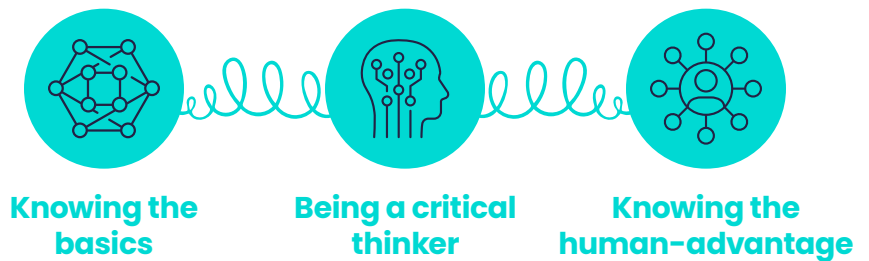
AI Readiness

The ability and underlying skills to apply AI literacy to one’s professional and personal endeavors. A person is AI ready when they understand interdisciplinary impacts of AI and can apply their human advantage alongside evolving technology and leverage collaboration, creativity, and self-advocacy alongside AI to achieve their life and career potential.

To build the AI Literacy & Readiness Competencies, aiEDU looked to multiple perspectives and research.

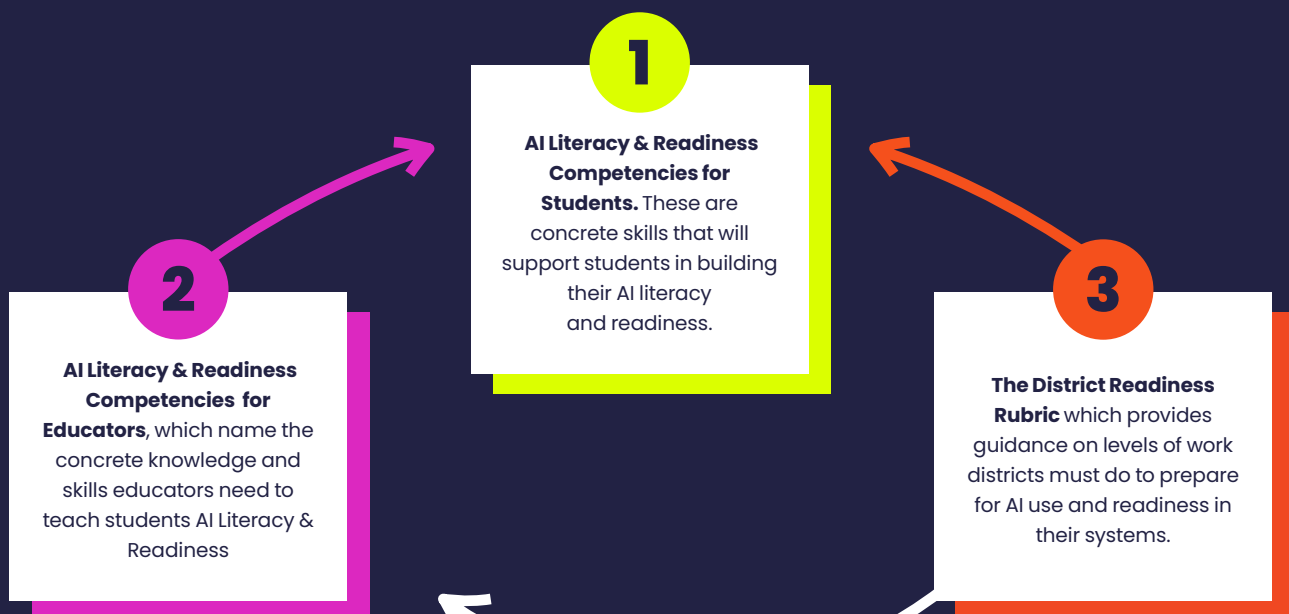
See our [Methodologies section](#) for more details.

Building from this body of work, we saw a progression of learning for AI literacy and readiness for students and educators.



In addition, to support educators and students, we saw specific actions for districts to take to ensure their systems are AI ready.

This framework has three parts.



**It should be noted that these competencies span all subject areas and are intended for all teachers.*

AI Literacy & Readiness Competencies

Student



Overview

The AI Literacy & Readiness Competencies for Students is organized into three overarching domains: **Know Your Basics**, **Be a Critical Thinker**, and **Know the Human Advantage**. Within each domain, there are three competencies that are then broken down into grade bands (K-5, 6-8, and 9-12) specific descriptions and skills. Teachers can see how learning these skills progresses over time and what can be appropriate for the age group they teach as well as prior skills to support. Competencies do not need to be addressed in any particular order, but offer multiple entry points for building AI literacy and readiness skills in any class. The 21st Century and Durable skills of communication, collaboration and creativity are embedded throughout the competencies – these are essential skills for AI readiness as well.

Example Student Activity to Promote AI Literacy Skill Building

AI Snapshots are a set of classroom warm-ups designed to help students build a basic understanding of AI. In only 10 minutes of class time, students will learn to define, identify, and think critically about artificial intelligence.

For example, the snapshot below can be facilitated using Four Corners (assign each corner of the room a different response – Strongly Agree, Agree, Disagree, Strongly Disagree. Then have students move to a corner and discuss their thinking). This will support students in developing in student competency 2a: Be a Critical Thinker – Examine AI use and output.

English

1

→ Chat to search

An AI company wants to replace **search engines** with **answer engines**. The new way to search online would involve talking with a chatbot that can answer questions directly instead of a traditional search that returns a list of links.

Proponents say this makes the online search experience easier and more natural, while critics worry about the spread of misinformation and decline in critical thinking.

?

Should talking with a chatbot replace traditional search? Why or why not?

An illustration of a person's face with blue hair and a wide smile, with a speech bubble coming out of their mouth that says "BLA BLA BLA ...".

The logo for AI Snapshots, featuring a stylized camera icon and the text "AI Snapshots".



Domain 1: Know Your Basics (AI Literacy)			
Competency	Grades K–5	Grades 6–8 (includes all previous skills)	Grades 9–12 (includes all previous skills)
a. Recognize AI Systems	Recognize and ask questions about AI and non-AI in familiar technologies (e.g., smart speakers, NPCs in games) - Define AI - Describe responsible use of AI and non-AI tools - Identify and discuss types of identity data (e.g., name, address) and their importance in different contexts, including AI powered tools	Use and critically compare outputs of age-appropriate AI tools and applications - Recognize and assess the appropriateness and effectiveness of AI applications in various contexts, considering factors such as problem complexity, data availability, and potential risks and benefits "Identify how personal information is being collected, used, and shared;" (Digital Promise, 2024) know how to effectively manage/delete data collecting - Identify what datasets were used to train an AI model and what AI models and methods were used to develop a tool	Evaluate AI systems for specific tasks, considering efficiency, ethics, and societal impact. "Responsibly engage in the consumption, creation, or sharing of AI-enabled products, including ethical sourcing and citation" (Digital Promise, 2024) "Identify how personal information is being collected, used, and shared;" (Digital Promise, 2024) know how to effectively manage/delete data collecting - Critically evaluate what datasets were used to train an AI model and what AI models and methods were used to develop a tool
b. Understand the Mechanics of AI	Know that AI learns from data and follows instructions (algorithms). - Identify generally how AI learns from data and connect this to how computer systems work together (CSTA, 2017) - Develop algorithmic thinking through collaboration on breaking down simple problems into sequenced steps, testing those steps, refining the steps to build automaticity	Describe basic AI concepts like machine learning neural networks, and decision trees - Identify and describe AI concepts of machine learning, neural networks, and decision trees - Develop algorithmic thinking through collaboration on breaking down problems into sequenced steps, testing those steps, and refining the steps to build automaticity	Describe how large language models (LLMs) work and compare how different AI approaches suit various problems - Evaluate more complex AI concepts (e.g., supervised vs. unsupervised learning) based on the needs of a problem; situate these concepts within levels of abstraction within software and hardware layers (CSTA, 2017) Refine algorithmic thinking through <i>collaboration</i> on breaking down complex problems into sequenced steps, testing those steps, and refining the steps to build automaticity

**We intend to release a distinction between Upper Elementary and Lower Elementary in a future version*



Domain 2: Be a Critical Thinker (AI Literacy)

Competency	Grades K–5	Grades 6–8 (includes all previous skills)	Grades 9–12 (includes all previous skills)
a. Identify and address biases	Identify why outputs from AI tools have discrepancies (e.g., values and bias in creating data sets) - Compare outputs from AI tools given different prompts - Connect discrepancies in outputs to ideas of fairness - Gather and sort data noticing patterns and outliers	Discuss how AI systems might reflect biases of their creators or training data (AI4K12, 5–A.iii, 2022) - Recognize and explain the different perspectives on key ethical issues surrounding AI, such as bias, transparency, and accountability - Identify benefits and drawbacks of AI tools for a job, considering who or what might be left out - Choose appropriate data for AI tasks, considering relevance and potential biases	Critique AI systems for embedded biases and propose ways to make them more inclusive and ethical. “Understand how values, beliefs, and points of view are applied through AI-enabled systems and outputs” “Identify how bias in data collection informs reporting”
b. Examine AI use and outputs	Ask and answer questions about products created by AI and non-AI tools - Ask questions about the sources used in a response - Ask questions about the problem to determine what tool would be best	Assess the reliability and limitations of AI outputs in various scenarios. - Develop questions to review and compare tone, content, and credibility of outputs from various AI tools - Compare different tools for a given problem, identifying benefits and drawbacks, to make recommendations about the best tool for a problem - Compare multiple perspectives/outputs/sources before finalizing a product	Critically assess AI outputs, considering potential biases and limitations. “Evaluate outputs of AI-enabled system for appropriate tone, audience, and content” and “evaluate the credibility or accuracy of an output prediction (Digital Promise, 2024)” - Determine if and how an AI algorithm is the right tool for the job “Analyze and synthesize multiple perspectives to support lateral reading” (Digital Promise, 2024)

c. Be continuously curious about AI's influence	Discuss how AI tools can help or cause harm in everyday situations - Identify personal interests and curiosities related to AI - Explore and reflect on age-appropriate AI current events - Identify ways technology, including AI, can support with self-awareness & self-management Engage in situations that have more than one entry point and/or solution to build comfort with ambiguity	Identify, compare, and be able to discuss the pros and cons of use of AI in different fields (e.g., healthcare, agriculture) and the impact on the environment - Build understanding of how AI systems use energy and space - Explore, reflect on, and discuss the benefits and drawbacks AI use in personal life, school, media, society and careers - Describe benefits and pitfalls of use of AI technology for social awareness, self-awareness, and self-management Engage with and remain persistent with open-ended problems requiring multiple perspectives and approaches with AI use	Analyze the long-term effects of AI systems on individuals, the workforce, society, and the environment "Consider the benefits and/or costs of AI to individuals, society, and the environment" (Digital Promise, 2024) - Analyze the environmental impact of AI systems - Demonstrate use of AI technology for social awareness, self-awareness, self-management, and responsible decision making Engage with ongoing learning about AI with peers, school communities, and personal communities
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Domain 3: Know the Human Advantage (AI Readiness)


Competency	Grades K-5	Grades 6-8 (includes all previous skills)	Grades 9-12 (includes all previous skills)
a. Be innovative and persistent in pursuit of solutions	Identify simple problem-solving steps and practice persistence in solving puzzles or challenges	Apply creative thinking techniques to AI-related problems and develop multiple solution strategies	Design and implement innovative AI and human-centered solutions for complex problems, demonstrating perseverance through iterative processes
b. Synthesize interdisciplinary and AI knowledge to approach problems holistically	Recognize that AI can be used in different subjects like art, science, and math	Connect AI concepts to various school/core subjects and real-world applications	Integrate knowledge from multiple disciplines (e.g. psychology, computer science) to address complex AI challenges
c. Leverage collaboration and self-advocacy in navigating career pathways	Participate in team activities that simulate AI-assisted work and discuss different jobs that use AI	Explore and engage with others about career pathways and the impact of AI on the evolution of skills required for roles within these careers	Collaborate with peers and people in industries to develop strategies for career pathways, leveraging interpersonal and AI skills

AI Literacy & Readiness Competencies

Educator



Overview

The AI Literacy & Readiness Competencies for teachers highlights the key knowledge and skills for teachers to successfully build their own AI literacy and readiness and support students in developing their AI literacy and readiness. These educator competencies are organized into three overarching domains:



**Know and Model
the Basics**



**Foster and Model
Critical Thinking**

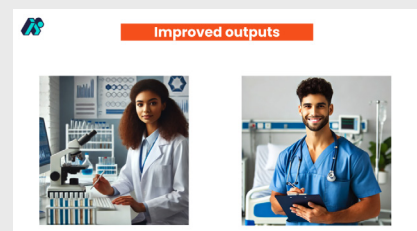
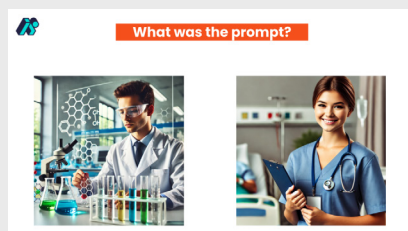


**Know The Teacher
Advantage**

While these echo the domains of the student competencies, they are not intended to be a one-to-one match. For example, in the *teacher* domain “Know and Model the Basics”, competency 1c focuses on identifying, describing and applying district/school AI policies for use. This is an overarching competency that will allow teachers to be able to support students in building their knowledge of AI use, which is related to student competencies 1a – recognize AI systems and 2b – examine AI use and outputs.

Example Educator Professional Learning Activity

In aiEDU professional learning sessions, we ask educators to think about inputs and outputs to generative AI tools to unpack and address the bias built into the AI data sets and our own prompting. An activity like this supports educators developing in **2a: Model evaluation and responsible engagement of AI content**. Providing educators opportunities to engage with AI tools and AI literacy skills in collaborative ways will support building their AI readiness.





Domain 1: Know and Model the Basics

a. Build knowledge of AI literacy and readiness skills	All student HS competencies
b. Build pedagogical knowledge of AI literacy and readiness skills	- Explain, in age appropriate ways, what AI is, AI uses and applications, and best practices - Identify relevant and age-appropriate examples of how personal information is being collected and used within AI tools - Create learning opportunities for students on current and future facing AI use and implications
c. Identify, describe, and apply district/school AI policies for use	- Ensure equitable and accessible use of AI for all students - Situate safe and responsible individual and classroom AI use within school/district AI use cases - Understand and apply district/school policies on AI citations and plagiarism in student work - Understand and apply district and school policies on collection, storage, and use of student data within AI tools, as situated within district student data policies and FERPA - Implement family communication and engagement with AI per school/district policy



Domain 2: Foster and Model Critical Thinking

a. Model evaluation and responsible engagement of AI content	- Critically evaluate if AI tools are best for a given purpose or not - Examine data collection processes of AI tools and make adjustments to ensure privacy and security - Review of inputs to AI and AI created outputs that explore values, beliefs, bias, costs, and benefits - Engage students with credibility checks on sources and AI outputs - Facilitate age-appropriate discussions on current and long-term effects of AI on individuals, the work force, society, and the environment
b. Understand what student-facing AI tools/resources are used in existing curricular materials and effectively implement them	- Identify and analyze existing curricular materials for AI tools/resources for the following: 1. Purpose, 2. Impact on student learning, 3. Accessibility, 4. Safety - Build fluency, with student & teacher version, with any curriculum based AI tools - Determine clear directions and guidelines for student use of curriculum based AI tools that adhere to school/district policies - Engage in ongoing reflections and evaluation of the efficacy of the AI tools based on your knowledge of students, student learning data analysis, and levels of student engagement and enthusiasm
c. Evaluate and responsibly use AI tools to support teaching and learning including: grading, lesson development, modeling for students and/or assessment creation	- Analyze teacher-assistant AI tools for the following: 1. Purpose 2. Data security 3. Quality of output (e.g., alignment to relevant standards, accessibility of language) 4. Usability - Engage in collaborative processes to draft, revise, test, and determine efficacy of AI teacher-assistant tool - Effectively use AI tools to support student learning during lessons - Engage in ongoing learning and reflection on the efficacy and safety of teacher-assistant AI powered tools



Domain 3: Know the Teacher Advantage

a. Create opportunities for students to creatively and collaboratively problem-solve	• Create learning opportunities that challenge students to collaborate, innovate, and communicate in problem-solving • Develop students metacognitive skills that support with problem-solving • Build class culture that fosters collaboration, co-creation, and feedback
b. Model and create opportunities for students to synthesize interdisciplinary and AI knowledge to approach problems holistically	• Create learning opportunities that build from students' interest and relevant real-world situations, that require considering multiple different subjects and/or perspectives • Build class structures that support students in analyzing the use of AI tools within work they are doing or problems they are trying to solve
c. Leverage collaboration and self-advocacy in supporting students to navigate academic and career pathways in an AI-powered world	• Build a class culture that support students in having choice, being able to adjust course based on learning, and communicate the questions they have and/or support they need • Build relationships with students to understand their motivations and identifying how to continue to grow their value

AI Readiness Rubric

District



Overview

The District Readiness Rubric is a tool to support district level leaders in creating equitable and inclusive **Systems AI Readiness** that ensures *all* students have the opportunity to meaningfully engage with AI literacy and readiness skill building as well as gain access to any AI tools a district will use. This rubric builds on the work shared by the Council of the Great City Schools & CoSN Launch K-12 Generative Artificial Intelligence (Gen AI) Readiness Checklist, the ILO group, and learnings from districts we have partnered with in developing AI readiness plans. Our District Readiness Rubric is intended to be higher level, with specific links and resources provided for additional details. This is a starting point for systems AI readiness work.

Systems AI Readiness is the ability for an educational system, institution, or organization to effectively support building AI literacy and readiness within educators and students. This includes operationalizing AI use, setting guidelines for acceptable use and academic integrity, creating a culture of curiosity, collaboration, and ongoing learning with AI literacy and readiness, and ensuring community engagement.



Vision & Strategic Orientation Example

Prince George's County Public School built a multi-year strategic plan anchored in a vision statement and anchor core values, with clear areas of focus: professional learning, engaging stakeholders, ethical considerations, and curriculum integration. In addition, there is a 3-year implementation plan outlined with key outcomes for each of the focus areas. You can see more [here](#).



Policy & Operations Example

InnovateOhio, an Ohio state agency, in collaboration with aiEDU, built an AI toolkit to support district level policymakers, teachers, and parents to advance AI readiness in Ohio schools. This resource contains processes for policy makers, along with specific tools and resources to support policy makers operationalize AI readiness in their systems. There are also guides to support parents and teachers in building their knowledge and skills with AI readiness. You can see more [here](#).

Domain	Level 1: Demonstrate Commitment	Level 2: Invest & Implement	Level 3: Deepen & Iterate
Equitable Vision and Strategic Orientation	Collaboratively develop a perspective on the role of AI within the district and document through a vision, strategic plan, or working document (see CGCS & CoSN K-12 Generative AI Readiness Checklist , Section I: Executive Leadership Readiness, I. Strategy)	Enact the strategic plan, providing as needed, training to those affected and building in monitoring and feedback mechanism	Revist and adapt vision and plan, supporting strategies and communication to the evolving landscape of AI
Community Engagement	Seek community perspectives to inform equitable vision	Develop routines to communicate and implement the vision across district and community	Develop feedback loops that include community, educator and student perspectives
AI Readiness Knowledge	Read the Student and Educator AI Literacy & Readiness Competencies documents	Create learning space for school level leaders to learn and internalize the Student and Educator AI Literacy & Readiness Competencies	Integrate Student and Educator AI Literacy & Readiness Competencies into existing teacher evaluation and student assessment tools
Teaching & Learning	Create opportunities for school leaders and teachers to engage in professional learning about AI, AI literacy, and AI readiness in the classroom • Build resources for school leaders to use in leading their teams with AI literacy & readiness goals that include: • Creating a common goal & identify a metric for measuring progress toward this goal • Content/Grade-team specific support • Regular team/school-wide check ins to report and reflect on progress • A plan to reach all students	Create a district-wide goal/ initiative on building AI literacy & readiness with educators Support schools in creating and implementing school-wide AI literacy & readiness goals with educators and students Create opportunities for leaders, teachers, and students to showcase their work with AI to the community Cultivate champions to lead and promulgate AI readiness	Showcase AI readiness examples from stakeholders Leverage communication systems to share impact of AI readiness initiatives Engage in ongoing communities of learning to evaluate, adjust, and change practices

Domain	Level 1: Demonstrate Commitment	Level 2: Invest & Implement	Level 3: Deepen & Iterate
Policies & Operations	Create an AI readiness task force or steering committee, composed of instructional and non-instructional roles across the district, to build a inclusive, adaptive and transparent vision, plan, and guidance for ethical use of AI use by students, teachers, leadership, and central office staff (see CGCS & CoSN K-12 Generative AI Readiness Checklist, Section 1: Executive Leadership Readiness, 3. Use Policy) Set-up and implement technical, legal, and fiscal audits specific to requirements for adopting AI tools and ongoing AI use, in adherence to data privacy laws (e.g., FERPA) (see CGCS & CoSN K-12 Generative AI Readiness Checklist, Section 2: Operational Readiness & Section 3: Data Readiness) Develop “an AI purchasing sign-off & integration roadmap” (ILO Group, 2024)	Policy document, including forums to gather and discuss AI impacts from all stakeholders Communicate AI policy and AI incident response system to families Implement AI incident training and response system, leveraging existing communication systems “Conduct a data-integrity check for any data AI systems will potentially use” (ILO Group, 2024) “Set up AI-specific district-wide IT support & feedback loops” (ILO Group, 2024) “Implement an AI purchasing sign-off & integration roadmap” (ILO Group, 2024) “Outline a specific budget for AI initiatives, including hardware/ software, maintenance, oversight, and training expenses” (ILO Group, 2024)	Iterate on AI policy, leveraging feedback from stakeholders “Set-up and later conduct comprehensive ROI analysis on different AI programs that are used” (ILO Group, 2024)

Methodologies

To build the AI Literacy & Readiness Competencies, aiEDU looked to multiple perspectives and research. We surveyed and interviewed over 1800 educators to understand what educators' biggest needs are. Our approach was guided by the urgent need to prepare students to thrive in an AI-driven world, as highlighted by aiEDU's mission and vision (aiEDU, 2024).

We included findings from research-based AI literacy frameworks and guidance from:

- [Digital Promise's framework](#), which emphasizes three components: Understand, Use, and Evaluate.
- UNESCO's [Guidance for generative AI in education and research](#), [AI and education: Guidance for policy-makers](#), [AI competency framework for teachers](#), and [AI competency framework for students](#) which focus on three progression levels: understand, apply, and create on four aspects: human-centered mindset, ethics of AI, AI techniques and applications, and AI system design.
- [The Kapor Foundation's Responsible AI Guide](#) (Kapor Foundation, 2024), which we particularly appreciated for its approach to tying competencies directly to lessons, providing a clear path from theory to practice.
- [EDSAFE AI S.A.F.E Benchmarks](#), which provides policy roadmaps for creating a safe AI ecosystem
- [CGCS & CoSN's K-12 Generative AI Readiness Checklist](#) which provides a detailed checklist for local educational agencies for how to approach AI implementation across their system.
- [ILO Group's Framework for Implementing Artificial Intelligence \(AI\) in K-12 Education](#) which provides four areas of consideration, political, operational, technical, and fiscal, for district-wide areas of consideration with AI implementation, along with examples of department specific AI applications.
- North Carolina Department of Public Instruction's [Generative AI Implementation Recommendations & Considerations for PK-13 Public Schools](#)

To situate our competencies within existing workforce frameworks, we connect to the:

- [Framework for 21st Century Learning](#)
- [America Succeeds Durable Skills](#)
- [World Savvy Global Competence Matrix](#)

To highlight AI knowledge and literacy's roots in computing and digital literacy, we draw from:

- [ISTE's standards](#)
- [CSTA's K-12 Computer Science Standards](#)
- [AI4K12's K-12 AI Guidelines](#)

This research revealed several key themes across frameworks (understanding the basics of AI, ethical considerations, critical evaluation, interdisciplinary approach, operational support, life-long learning, and teacher support) that we've synthesized and added to in our frameworks.

Acknowledgements

aiEDU is proud to be one of many nonprofit organizations dedicated to supporting teachers and students in building the skills necessary for success in the age of AI. As part of this broader ecosystem, we recognize the value of collaboration and are deeply grateful for the insights and contributions from the organizations we've partnered with throughout the development of this report. Each partner has provided invaluable feedback, including constructive criticism, innovative ideas, and fresh perspectives, all of which have strengthened our work and our vision for AI readiness. We'd like to acknowledge these organizations for their dedication to this shared mission, and we are honored to work alongside them in creating a future where students and educators alike are equipped with the AI literacy and readiness skills they need to thrive.



Booz | Allen | Hamilton



Citations

AI4K12. (2020). K-12 AI Guidelines. <https://ai4k12.org/>

America Succeeds. (2019). Durable skills framework. <https://www.durableskillsadvantage.org/>

Broussard, M. (2023). More than a glitch: Confronting race, gender, and ability bias in tech. MIT Press.

Chai, C.S., Lin, P.-Y., Jong, M.S.-Y., Dai, Y., Chiu, T.K., & Huang, B. (2020). Factors influencing students' behavioral intention to continue artificial intelligence learning. In 2020a International Symposium on Educational Technology (ISET). (pp. 147–150). <https://doi.org/10.1109/ISET49818.2020.00040>

Chai, C.S., Lin, P.-Y., Jong, M.S.-Y., Dai, Y., Chiu, T.K., & Qin, J. (2021). Perceptions of and behavioral intentions towards learning artificial intelligence in primary school students. Educational Technology & Society, 24 (3), 89–101. Retrieved from <https://www.jstor.org/stable/27032858>

Chen, M., Zhou, C., & Wu, Y. (2020). Research on the model and development status of information literacy self-improvement ability of primary and secondary school teachers. In Ninth International Conference of Educational Innovation through Technology (EITT). (pp. 87–91). <https://doi.org/10.1109/EITT50754.2020.00021>

Cheung, S. K., Lam, J., Li, K. C., Au, O., Ma, W. W., & Ho, W. S. (Eds.). (2018). Technology in Education. Innovative Solutions and Practices: Third International Conference, ICTE 2018. Springer.

Chittora, S., & Baynes, A. (2020, October). Interactive Visualizations to Introduce Data Science for High School Students. In Proceedings of the 21st Annual Conference on Information Technology Education. (pp. 236–241). <https://doi.org/10.1145/3368308.3415360>

Crabtree, M. (2023). What is ai literacy? A comprehensive guide for beginners. <https://www.datacamp.com/blog/what-is-ai-literacy-a-comprehensive-guide-for-beginners>

CSTA. (2017). CSTA K-12 Computer Science Standards. <https://csteachers.org/k12standards/interactive/>

- Cummings D., Anthony M., Watson C., Watson A., & Boone S. (2021). Combating social injustice and misinformation to engage minority youth in computing sciences. In Proceedings of the 52nd ACM Technical Symposium on Computer Science Education. (pp.1006–1012). <https://doi.org/10.1145/3408877.3432452>
- EDSAFE AI. (2021). S.A.F.E Benchmarks. <https://www.edsafeai.org/safe>
- Long, D., Magerko, B. 2020. What is AI Literacy? Competencies and Design Considerations. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–16. <https://doi.org/10.1145/3313831.3376727>
- Ellis, G., Ory, E., Bhushan, N. (2005). Organizing a K-12 AI curriculum using philosophy of the mind. Engineering: Faculty Publications, Smith College. Retrieved from https://scholarworks.smith.edu/egr_facpubs/96
- Gao, J., & Wang, L. (2019). Reverse thinking teaching discussion in high school information technology under new curriculum standards. In 14th International Conference on Computer Science & Education (ICCSE). (pp. 222–226). <https://doi.org/10.1109/ICCSE.2019.8845429>
- Gong, X., Zhao, L., Tang, R., Guo, Y., Liu, X., He, J., ... Wang, X. (2019). AI education system for primary and secondary schools. In 2019 ASEE Annual Conference & Exposition .
- Han, X., Hu, F., Xiong, G., Liu, X., Gong, X., Niu, X., ... Wang, X. (2019). Design of AI + curriculum for primary and secondary schools in Qingdao. In Chinese Automation Congress (CAC) . (pp. 4135–4140). <https://doi.org/10.1109/CAC.2018.8623310>
- Ho, J. W., Scadding, M., Kong, S. C., Andone, D., Biswas, G., Hoppe, H. U., & Hsu, T. C. (2019). Classroom activities for teaching artificial intelligence to primary school students. In Proceedings of international conference on computational thinking education. The Education University of Hong Kong. (pp. 157–159).
- ILO Group. (2024). Framework for implementing artificial intelligence. https://www.ilogroup.com/wp-content/uploads/2024/03/Framework-for-Implementing-Artificial-Intelligence-AI-in-K-12-Education_v1.0.pdf
- International Society for Technology in Education. (2024). ISTE Standards. <https://iste.org/standards>
- Judd, S. (2020). Activities for Building Understanding: How AI4ALL Teaches AI to Diverse High School Students. In Proceedings of the 51st ACM Technical Symposium on Computer Science Education. (pp. 633–634). <https://doi.org/10.1145/3328778.3366990>
- Jump, A., Bradley, A., Goodness, E., Miclaus, R., Emerging Tech: Primary Impact of Generative AI on Business Use Cases. September 2023
- Kandlhofer, M., Steinbauer, G., Lasnig, J.P., Baumann, W., Plomer, S., Ballagi, A., & Alfoldi, I. (2019). Enabling the creation of intelligent things: Bringing artificial intelligence and robotics to schools. In IEEE Frontiers in Education Conference (FIE) . (pp. 1–5). <https://doi.org/10.1109/FIE43999.2019.9028537>
- Keller, J., Donoghoe, M., Perry, A., (2024). The us must balance climate justice challenges in the era of artificial intelligence. <https://www.brookings.edu/articles/the-us-must-balance-climate-justice-challenges-in-the-era-of-artificial-intelligence/>
- Kennedy, K. (2023). Ai literacy framework. <https://kennedyhq.com/wp/2023/12/21/ai-literacy-framework/>
- Lee, I., Ali, S., Zhang, H., Dipaola, D., & Breazeal, C. (2021). Developing middle school students' ai literacy. In Association for Computing Machinery, Inc. (pp. 191–197). <https://doi.org/10.1145/3408877.3432513>
- Lee, S., Mott, B., Ottenbriet-Leftwich, A., Scribner, A., Taylor, S., Glazewski, K.,...Lester, J. (2020). Designing a collaborative game-based learning environment for ai-infused inquiry learning in elementary school class- rooms. In Proceedings of the 2020 ACM conference on innovation and technology in computer science education . (pp. 566–566). <https://doi.org/10.1145/3341525.3393981>

- Lin, P., & Brummelen, J. (2021). Engaging teachers to co-design integrated ai curriculum for k-12 classrooms. In CHI '21: Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems . (pp.1–12). <https://doi.org/10.1145/3411764.3445377>
- Lindner, A., & Berges, M. (2020). Can you explain ai to me? teachers' pre- concepts about artificial intelligence. In IEEE Frontiers in Education Conference (FIE). (pp. 1–9). <https://doi.org/10.1109/FIE44824.2020.9274136>
- Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In Proceedings of the 2020 chi conference on human factors in computing systems. (pp. 1–16). <https://doi.org/10.1145/3313831.3376727>
- Micheuz, P. (2020). Approaches to Artificial Intelligence as a Subject in School Education. In T. Brinda, D. Passey, & T. Keane (Eds), Empowering Teaching for Digital Equity and Agency. OCCE 2020. IFIP Advances in Information and Communication Technology, 595. Springer. https://doi.org/10.1007/978-3-030-59847-1_1
- Mills, K., Ruiz, P., Lee, K., Coenraad, M., Fusco, J., Roschelle, J. & Weisgrau, J. (2024, May). AI literacy: A framework to understand, evaluate, and use emerging technologies. <https://doi.org/10.51388/20.500.12265/218>
- Mossavar-Rahmani, F., & Zohuri, B. (2024). Artificial Intelligence at Work: Transforming Industries and Redefining the Workforce Landscape. Journal of Economics & Management Research
- Nisheva-Pavlova, M.M. (2021). Ai courses for secondary and high school – comparative analysis and conclusions. In CEUR Workshop Proceedings, 3061. (pp. 9–16).
- Olari, V., & Romeike, R. (2021). Addressing ai and data literacy in teacher education: A review of existing educational frameworks. In WiPSCE '21: The 16th Workshop in Primary and Secondary Computing Education, 17. (pp. 1–2) <https://doi.org/10.1145/3481312.3481351>
- P21 Resources. Frameworks for 21st Century Learning. <https://www.battelleforkids.org/insights/p21-resources/>
- The Council of the Great City Schools (CGCS) and Consortium for School Networking (CoSN). (2023). K-12 generative AI readiness checklist. <https://www.cgcs.org/genaichcklist>
- TeachAI. (2023). AI guidance for schools toolkit. <https://www.teachai.org/toolkit>
- United Nations Educational, Scientific and Cultural Organization. (2023). Guidance for generative ai in education and research. <https://doi.org/10.54675/EWZM9535>
- United Nations Educational, Scientific and Cultural Organization. (2021). AI and education: guidance for policy makers. <https://doi.org/10.54675/PCSP7350>
- United Nations Educational, Scientific and Cultural Organization. (2024). AI competency framework for teachers. <https://doi.org/10.54675/JKJB9835>
- United Nations Educational, Scientific and Cultural Organization. (2024). AI competency framework for students. <https://doi.org/10.54675/ZJTE2084>
- White, S., Scott, A., Koshy, S. (2024). Kapor Foundation. Responsible ai and tech justice: A guide for K-12 education. <https://kaporfoundation.org/wp-content/uploads/2024/01/Responsible-AI-Guide-Kapor-Foundation.pdf>
- World Economic Forum. (2024). Global Risks Report. https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2024.pdf
- World Savvy. (2024). The Global Competence Matrix. <https://worldsavvy.org/global-competence/>

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