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Guidance for the Use of AI in the K-12 Classroom

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In the age of internet searching and smartphones, students can look up answers to factual-based questions almost instantaneously. This shift has encouraged teachers to develop assignments that push students to think deeply beyond online resources. As a result, students have had to develop critical thinking skills to determine which sources provide the most accurate information for a specific task or need. The advent of artificial intelligence adds another layer by allowing students to have papers, artwork and other creative tasks completed for them with a well-written prompt and the right AI-generative tool.

Furthermore, many jobs and careers may require AI tools to perform routine tasks or as brainstorming and drafting tools. This presents a unique opportunity to engage students in rich and intellectually demanding assignments that deeply engage students in individual and collaborative creativity. AI must become seen as a tool rather than the final product.

As artificial intelligence continues to embed itself in various aspects of everyday life, its integration into education presents tremendous opportunities and unique challenges. Educators, administrators and other shareholders now face a rapidly changing technological landscape that is often difficult to navigate. In this context, clear and comprehensive guidance is crucial to help shareholders understand how to effectively incorporate AI tools while addressing potential ethical, pedagogical and practical concerns.

This guidance aims to promote thoughtful and responsible AI adoption in education, ensuring that it enhances, rather than detracts from, schools' core mission of fostering student success.

This document serves as a resource for educators, exploring the opportunities and the concerns in using AI in the classroom. It highlights how AI can enhance personalized learning, improve data-driven decision-making, and free up teachers' time for more meaningful student interactions. Additionally, it addresses the potential risks, such as data privacy issues, algorithmic biases, and the importance of maintaining the human element in teaching.

For a detailed overview of the skills and attributes required for teachers to be AI-literate, refer to Appendix A, which outlines the competencies necessary to effectively engage with AI in the classroom. By following these guidelines, educators will be better equipped to harness AI's power while responsibly mitigating potential pitfalls.

While the primary audience for this guidance is teachers and school or district administrators, its relevance extends beyond the classroom. Policymakers can use this document to create regulations that ensure AI's ethical use in education, giving each student access to high-quality emerging technologies regardless of income or residency. Technology developers will benefit from insights into the educational needs and priorities that can guide the design of more effective AI tools. Researchers may find this document valuable as they explore the evolving role of AI in education, helping to shape future innovations that support teaching and learning.

Ultimately, this guidance aims to promote thoughtful and responsible AI adoption in education, ensuring that it enhances, rather than detracts from, schools' core mission of fostering student success.

Pillars of AI Use in the Classroom

PILLAR #1:

Use AI-infused tools to develop more cognitively demanding tasks that increase student engagement with creative problem-solving and innovative thinking.

To best prepare students for an ever-evolving workforce, students will need to be prepared to think critically and creatively. Teachers will need to design cognitively demanding assignments and assessments where generative AI and other tools may be used as part of the process, and student ingenuity is required to complete the tasks. In many classrooms, the bulk of assignments are based on completing factual and conceptual tasks that require little critical, creative or complex thinking. These assignments are the easiest for generative AI to produce.

However, tasks that students will face in their careers will require them to research, problem-solve, strategize, justify or create. Designing these cognitively demanding assignments that align with state content standards can take a lot of teacher planning time. AI-infused tools can assist in developing these tasks more quickly and efficiently. See the Appendix for a tool to support the design of cognitively demanding tasks.

Engaging students in complex, authentic scenarios will require students to use their critical thinking and problem-solving as they learn to navigate potential dilemmas.

AI draws on a broad spectrum of knowledge and has the power to analyze a wide range of resources not typically available in classrooms. Now more than ever, students need to be creators rather than mere purveyors of knowledge. Students should be taught the ethics of these tools as part of their creation and problem-solving process, allowing them to focus class time on polishing and adding their unique perspective to their work. While AI should not be the final step in the creative process, it can effectively serve in the early stages.

Opportunities

- **AI as a Lesson Planning Partner:** AI can help streamline the lesson planning process by creating assignments that shift toward a higher cognitive demand (bottom right of Hess' Matrix). Teachers, administrators and other support professionals can use AI tools to assess current assignments' intellectual demands and quickly provide ideas for deepening cognitive demand and student problem-solving on those assignments.
- **Critical Thinking Skills:** Generative AI is paving the way for more creative and innovative assignments that cannot be completed easily with AI (moving from knowledge reproduction to knowledge application). Teachers will need to intentionally teach critical thinking skills for tasks like assessing information and data for authenticity" vs AI-generated material.
- **Project-Based Learning and Interdisciplinary Assignment Creation:** Planning and implementing high-quality PBL or interdisciplinary units of study can be time-consuming for teachers and students. Generative AI tools can quickly generate an outline of a PBL unit based on state standards. Teachers can use this to develop a more thorough plan that aligns with standards, students' needs, and an established framework for high-quality PBL such as SREB's Powerful PBL Practices. Students can use AI tools as a brainstorming tool and a first step in the creation process.

- **Interactive Simulation and Scenario Creation:** Teachers can use AI-powered or developed simulations and scenarios to immerse students in complex scenarios that relate their content to real-life situations. They may also provide historical context or add meaning to a fictional text or situation. Moreover, engaging students in complex, authentic scenarios will require students to use their critical thinking and problem-solving as they learn to navigate potential dilemmas.
- **Student-Generated Content:** Students can use AI-embedded tools to create content, such as videos, presentations or interactive stories. This can foster creativity and innovation while deepening their understanding of the subject. It can also aid in their engagement and completion of PBL and interdisciplinary units of study.
- **Counter Perspective:** Students can use AI to explore and comprehend opposing viewpoints on topics they are researching or attempting to solve. AI offers a safe platform for disagreement, which fosters critical thinking and strengthens students' argumentation skills.

Cautions

- **Effective Use of AI:** Teachers and students must learn how to be effective prompt engineers and use critical thinking skills to measure the value of the information generated (the new search strings and knowing source credibility online).
- **Recognize the Inherent Bias in AI Systems:** AI has intrinsic biases and can provide decisions and products that do not fully capture the complexities of a problem or task. Teachers and students must use AI tools as a starting point and not solely rely on them as the best decision or product. Students will need to develop their written and creative voice to personalize what an AI-infused app creates for them. Teachers need to remain actively involved in the planning and execution of AI-infused or generated tasks by providing guidance and scaffolding to students as needed.
- **Ensuring Mastery of State and District Standards:** While AI can be an excellent starting point for creating more intellectually demanding tasks, AI systems may not know their specific state and district standards or individual students. Teachers must balance AI-generated tasks with their unique standards, pedagogy and students' interests and learning needs.
- **Process-Focused Teaching:** Some fear that AI will replace student thinking. One approach to this would be to ensure that students grasp underlying knowledge and concepts before using AI in creativity and evaluation processes such as editing, brainstorming and drafting. In other words, teach the long way first, then show students AI tools to enhance productivity.

Resources

1. Karin K. Hess (2009, updated 2013). *Linking research with practice: A local assessment toolkit to guide school leaders.* https://www.karin-hess.com/cognitive-rigor-and-dok
2. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. teachai.org/toolkit
3. Aqua. (2023, July 30). The Impact of Artificial Intelligence on Education – How AI is Revolutionizing the Learning Experience. AI News. https://aquariusai.ca/blog/the-impact-of-artificial-intelligence-on-education-how-ai-is-revolutionizing-the-learning-experience

PILLAR #2:

Use AI to streamline teacher administrative and planning work.

Teachers' jobs have become increasingly more complex. On top of planning highly engaging and cognitively demanding lessons and assignments, teachers also communicate with parents, develop plans of support for a variety of student behavior and learning needs, serve on school-based committees, review and analyze assessment and classroom data, manage the day-to-day affairs of their classrooms and provide timely feedback and grades on assignments. This is expected to fit into a 60 - 90-minute planning window that may also be utilized for team and other school-based meetings.

Teachers can use AI-infused technology and software as administrative assistants and planning partners. Already, teachers are starting to see how AI can streamline their work so they can focus on more important aspects of their work, such as designing enriching learning experiences for their students.

AI is a partner, not a replacement for a teacher.

Opportunities

- **AI as a Planning Partner:** Generative AI tools allow teachers to have a planning partner with a vast knowledge bank at their fingertips. As shared in Pillar 1, teachers can ask for lesson or unit planning ideas with specific pedagogical frameworks and specific standards. AI chatbots can serve as brainstorming partners, which help teachers expand their horizons and enhance their creativity to create more personalized and engaging content for their students.
- **Improve and Enhance Current Assignments:** Teachers can use AI tools to improve current assignments and ask for ideas to increase cognitive demand, differentiate them for specific learning needs, or provide more interactive activities. With the click of a few buttons, teachers may also use these tools to develop slides and graphic organizers or to develop questions based on a reading, image or video. It can also provide AI-modeled and created examples of work for students to practice fact-checking, grammar and tone editing and practice giving feedback.
- **Help with Providing Feedback on and Grading Student Work:** AI can enhance teacher grading by automating tasks like grading multiple-choice tests and fill-in-the-blank answers, providing preliminary evaluations for essays, and offering personalized feedback based on performance. Using natural language processing, AI can assess writing quality, provide grammar corrections and consistently offer rubric-based feedback, reducing grading bias. It also integrates with grade books and analyzes student performance data, helping teachers identify trends and adjust instruction. Additionally, AI assists in plagiarism detection (including detecting AI use) and can act as a virtual assistant, answering student questions and lightening the grading workload.
- **Support with Other Aspects of Teaching:** While lesson and unit planning is an essential aspect of a teacher's job, teachers also have a myriad of other tasks they need to accomplish in a given day. AI-infused software can help draft parent newsletters, letters of recommendation or emails with a specified tone (provided no private student information is fed into the AI system). It can also help support English as a second language students by translating assignments and other learning materials and providing just-in-time interpretation between students and teachers or students to students. AI systems can also help to manage classroom resources, such as tracking inventory of supplies and suggesting optimal usage based on lesson plans and activities.

- **Behavioral Insights:** As AI tools become more sophisticated, they may be able to monitor student behavior and engagement, providing teachers with insights and recommendations for effectively addressing classroom management issues.

Cautions

- **AI's Inherent Bias:** Every AI system has an inherent bias and may not represent the most up-to-date or pertinent information. Teachers must be aware of this bias and ensure that final plans meet students' needs and represent good pedagogical practice. They will need to work to assimilate what AI produces into their collective knowledge of pedagogy, their students' needs and interests, and their standards-based instruction. AI is a partner, not a replacement for a teacher. Moreover, generative AI tools may invent plausible-sounding falsehoods or hallucinations. Teachers should always carefully evaluate and verify facts, figures and data to ensure they do not present inaccurate information to students. They should not overly rely on AI-generated feedback on student work.

- **Importance of Student Data Privacy:** Federal and state laws mandate districts and schools to protect the privacy and data of the students they serve. When examining any technology tool approved for use with students, the terms and conditions must be carefully reviewed to determine how student data and information will be used within and by the system. Many AI systems collect data from their users to learn and use that data to produce better results. Companies that design AI systems may also store this data and sell it to third parties. Therefore, when adding AI-embedded software, schools and districts must be very cautious to protect student data privacy by never using any personally identifiable information in AI systems. Schools and districts will need to develop checklists or other guides to evaluate the safety of an AI system for use with their students' PII.

- **Over Reliance on AI Tools and Decisions:** AI tools and systems are not replacements for teacher ingenuity and creativity. Teachers need to avoid becoming overly dependent on them and work to maintain (and sharpen) their ability to plan and execute powerful teaching and learning experiences for their students.

- **Continuous Training:** As new technologies emerge, students need to know how to use them in their future careers and implement them in their daily lives. AI tools are also changing and improving exponentially in their capabilities. Teachers will need continuous training on effectively using AI and emerging technology and addressing any challenges or biases that may arise.

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. teachai.org/toolkit
2. Diebold, G., Han, C., & CENTER FOR DATA INNOVATION. (2022). How AI can improve K-12 education in the United States.
3. Ruiz, P., Richard, E., Chillmon, C., Shah, Z., Kurth, A., Fekete, A., Glazer, K., Pattenhouse, M., Fusco, J., Fennelly-Atkinson, R., Lin, L., Arriola, S., Lockett, D., Crawford-Meyer, V., Karim, S., Hampton, S., & Beckford, B. (2022). Emerging Technology Adoption Framework: for PK-12 education. https://doi.org/10.51388/20.500.12265/161
4. AI Integration Framework - WorkForce EdTech. (2024, July 5). Workforce EdTech. https://workforceedtech.org/ai-integration-framework/
5. Seldon, A., Lakhani, P., Luckin, R., & The Institute for Ethical AI in Education. (2021). The Ethical Framework for AI in Education. https://www.buckingham.ac.uk/wp-content/uploads/2021/03/The-Institute-for-Ethical-AI-in-Education-The-Ethical-Framework-for-AI-in-Education.pdf
6. Cutler, D. (2024, May 8). How AI can enhance the grading process. Edutopia. https://www.edutopia.org/article/using-ai-grading-tools-enhance-process/

PILLAR #3:

Use AI to support personalized learning.

Personalized learning is crucial in education because it acknowledges that each student learns differently and at their own pace. Traditional teaching methods often follow a uniform approach, which may not fully engage or challenge every student. AI can address this gap by analyzing vast student data — such as performance, engagement levels and learning behaviors — to create individualized learning experiences. AI-powered platforms can dynamically adjust the content, difficulty level and pacing to suit each student's needs. Struggling students will receive additional support through targeted resources while more advanced students can be presented with increasingly challenging material. AI's ability to adapt in real-time creates a more responsive learning environment where students can progress at a pace that matches their abilities. By combining the strengths of AI with human instruction, K-12 education can become more responsive to individual needs, fostering a more effective and engaging learning environment for all students.

AI can assist with adaptive technologies, like text-to-speech for visually impaired students or speech recognition tools for those with speech or hearing challenges.

Personalized learning empowers students to take ownership of their education, a process that AI can further enhance. AI-driven tools can provide continuous, real-time feedback and customized recommendations for learning resources, such as videos, readings or practice exercises. This helps students stay engaged, motivated and self-directed in their learning journey. By automating and scaling these processes, AI allows teachers to focus more on fostering deeper connections and critical thinking while ensuring that every student, regardless of their unique learning style or pace, has the tools to succeed. Ultimately, AI acts as a powerful facilitator of personalized learning, helping to create a fairer, more adaptive, and effective educational experience tailored to the needs of every student.

Opportunities

- **Supporting Students with Special Needs:** AI-powered tools can significantly enhance learning for students with special needs by offering customized support. AI can assist with adaptive technologies, like text-to-speech for visually impaired students or speech recognition tools for those with speech or hearing challenges. Additionally, AI systems can adjust learning materials to match the unique needs of students with cognitive, physical or emotional disabilities. This provides more adapted support, allowing students to fully participate and succeed in school.
- **Intelligent Tutoring Systems:** AI-driven tutoring systems provide one-on-one support outside of class time, offering explanations, answering questions, and guiding students through problem-solving. This may include offering personalized "sketch concepts" to push learners toward their next learning goal. These systems can mimic human tutors by offering personalized hints, encouragement and feedback based on each student's unique needs.
- **Predictive Analytics:** AI can analyze historical data to predict student performance and identify at-risk students early. Teachers can use these insights to intervene earlier with targeted support, such as extra tutoring or customized learning resources, preventing students from falling behind.

- **Automated Feedback:** AI can automate the feedback process for objective and subjective assessments. This saves teachers time and provides students with immediate, personalized feedback on their work, accelerating the learning process.
- **Customizable Learning Resources:** AI can curate and recommend a wide range of learning materials based on each student's performance and interests. For example, if a student struggles with fractions, the AI might suggest videos, interactive games or exercises tailored to help them grasp the concept.
- **Enhanced Collaboration Tools:** AI-powered collaborative platforms can facilitate personalized group work by forming student teams based on complementary skills, interests or learning needs. These platforms can also provide real-time suggestions to guide teamwork and project-based learning.
- **Natural Language Processing for Support:** AI-based NLP tools can help students with reading, writing and language development. They can offer real-time grammar and spelling suggestions, assist with reading comprehension, and support students learning new languages through interactive conversations.
- **Early Monitoring of Students:** AI tools, combined with educator expertise, can help monitor and support students who are at risk of failing, dropping out or on the verge of a mental health crisis by identifying signs of stress or disengagement and providing ideas for appropriate interventions or resources.
- **Language Translation and Support:** AI systems can offer real-time translation and language support for students who are non-native speakers, helping them better understand and engage with the curriculum.
- **Adaptive Learning Platforms:** AI can power adaptive learning systems that continuously assess student progress and adjust instructional materials in real time. These platforms help students progress at their own pace by offering tailored lessons, exercises, and assessments that match their skill levels and learning styles. These platforms may also be combined with gamification learning experiences that adapt to each student's progress and preferences, making learning more engaging and fun.

Cautions

- **Data Privacy and Security:** AI systems often rely on large amounts of data, including students' performance metrics, learning behaviors and personal information. Schools must protect student data from breaches or misuse. It is critical to comply with privacy regulations like FERPA, the Family Educational Rights and Privacy Act, and ensure that AI providers have robust data protection measures. AI-supported tools used within a school should have transparent algorithms that communicate how they make decisions and recommendations. School and district communities will need to establish clear guidelines for the ethical use of student data, ensuring that it is used responsibly and only for educational purposes.
- **Bias in AI Algorithms:** AI algorithms are only as unbiased as the data used to train them. The AI may reinforce those biases if historical data used in AI systems contains bias, such as skewed information used to teach the AI system or data missing on certain groups of students. AI tools should be developed and tested with fairness and inclusivity in mind so they don't disproportionately affect marginalized students. AI systems cannot be the end of the problem-solving or communication chain. Humans need to use information from AI systems as one source of information or ideas that can be used to support students' personalized learning processes.

- **Overreliance on Technology:** AI should complement, not replace, the human impact in education. Teachers provide essential support and creative guidance that AI cannot replace. Relying too heavily on AI for instruction or decision-making could diminish the personal connection and holistic understanding teachers bring to the classroom.
- **Access and Digital Divide:** AI-driven tools require consistent technology and internet access. AI may widen the achievement gap if these resources are not readily available to all students, particularly those from disadvantaged backgrounds. Schools need to ensure that all students have access to the necessary technology.
- **Balancing Screen Time:** Teachers and schools will need to be mindful of the amount of screen time AI tools and other technologies require and create a balanced educational experience that includes offline activities and face-to-face interactions.

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. teachai.org/toolkit
2. Diebold, G., Han, C., & CENTER FOR DATA INNOVATION. (2022). How AI can improve K-12 education in the United States.
3. Schiel, J., Bobek, B. L., & Schnieders, J. Z. (2023). High School Students' Use and Impressions of AI Tools. In ACT Research (pp. 2–4).
4. Ruiz, P., Richard, E., Chillmon, C., Shah, Z., Kurth, A., Fekete, A., Glazer, K., Pattenhouse, M., Fusco, J., Fennelly-Atkinson, R., Lin, L., Arriola, S., Lockett, D., Crawford-Meyer, V., Karim, S., Hampton, S., & Beckford, B. (2022). Emerging Technology Adoption Framework: for PK-12 education. https://doi.org/10.51388/20.500.12265/161
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6. Seldon, A., Lakhani, P., Luckin, R., & The Institute for Ethical AI in Education. (2021). The Ethical Framework for AI in Education. https://www.buckingham.ac.uk/wp-content/uploads/2021/03/The-Institute-for-Ethical-AI-in-Education-The-Ethical-Framework-for-AI-in-Education.pdf
7. FERPA | Protecting Student Privacy. (n.d.). https://studentprivacy.ed.gov/ferpa

PILLAR #4:

Develop students as ethical and proficient AI users.

Teaching students to use AI ethically is crucial for shaping a future where technology serves humanity's best interests. As AI becomes increasingly integrated into daily life, students must not only master the technical skills to use these tools but also understand the ethical implications of their use. Students can navigate the complexities of data privacy, bias and transparency by cultivating a sense of responsibility and critical thinking about the consequences of AI-driven decisions. This balanced approach ensures that future generations employ AI in ways that are both innovative and ethical, ultimately fostering a more just and thoughtful society.

Students will also need to be educated about the potential for bias in AI systems and the importance of developing and using AI responsibly to avoid perpetuating or exacerbating biases.

Opportunities

- **Planning Stages of Academic Work:** AI can significantly enhance brainstorming and outlining processes for students by providing various forms of support. For brainstorming, AI tools can generate a wide range of ideas and perspectives on a topic, helping students explore different angles and approaches. These tools can use natural language processing — a branch of AI that allows computers to understand, generate and manipulate human language — to analyze keywords and suggest related concepts or themes that students might not have initially considered.

  AI can also help organize thoughts and ideas into a coherent outline. AI can recommend logical sequences and suggest sections or headings to include by analyzing the key points a student wants to cover. AI can also offer templates, making it easier for students to create well-structured and focused outlines. Overall, AI acts as a collaborative tool, enhancing creativity and organization while saving time and effort in the planning stages of academics.

- **Critical Media Literacy:** Students will need to learn how to analyze and interpret AI-generated content. AI technologies are increasingly involved in creating, curating and disseminating information, which can impact students' understanding of the world. By guiding students in evaluating AI-driven media's credibility, bias and accuracy, teachers help them develop essential skills for discerning reliable information from misinformation. This support fosters better decision-making and responsible media consumption. It prepares students to actively participate in an information-rich society where critical thinking and media literacy are crucial for success. Schools and districts can assist with this by providing AI Literacy workshops for staff, students and families.

- **Cross-Disciplinary Learning:** Educational entities will need to encourage collaboration between technology and humanities departments to enable students to explore AI from multiple perspectives, including technical, ethical and societal viewpoints. For example, technology courses might cover the technical aspects of AI development, while humanities courses might cover the ethical, social and legal dimensions. Teachers can integrate real-world case studies of AI applications in various industries to illustrate benefits and ethical challenges. This can help students understand the real-world implications of AI technologies while helping them become effective AI users.

This cross-disciplinary learning equips students to navigate complex environments where AI is used. Cross-disciplinary learning prepares students to address the multifaceted challenges they will encounter in their careers by fostering a comprehensive understanding of AI's technical, ethical and societal dimensions. This approach enhances their technical skills and cultivates a sense of responsibility and adaptability, making students well-equipped to use AI in their careers.

- **Student-led AI Ethics Committees:** Students' use of AI to circumvent learning and thinking is a significant concern for many schools and districts. Establishing student-led AI ethics committees that review and discuss the ethical implications of AI projects and applications within the school can provide a platform for ongoing dialogue and learning.

Cautions

- **Bias in AI Systems:** Students will also need to be educated about the potential for bias in AI systems and the importance of developing and using AI responsibly to avoid perpetuating or exacerbating biases.
- **Ethical Use of AI in Research:** Students also need to learn how to use AI in research and consider its ethical implications. These may include issues related to consent, data privacy, and the potential impact of AI-driven research findings.
- **Cheating:** As AI tools become more advanced, students can be tempted to misuse these technologies to gain unfair advantages in their work. For example, AI-powered writing assistants or problem-solving tools can facilitate shortcuts that bypass genuine learning processes, leading to academic integrity issues. This misuse undermines critical thinking and problem-solving skills and diminishes the trust in AI technologies and their potential benefits. Educators must emphasize the importance of ethical behavior and ensure that students understand how to use AI responsibly and transparently, reinforcing that AI should be a tool for learning, not a means of circumventing effort and integrity. Students need to be exposed to learning activities where they can and cannot use AI so they can develop a sense of ethics around AI use.
- **Data Security:** The handling and use of data are central to AI technologies. Students need to understand that AI systems often require large amounts of data, including sensitive personal information. Teachers also need to understand that students' private identifiable information should never be entered into an AI system without data security safeguards. They must also be aware of what AI platform is powering the tool and how the data will be stored and used. If this data is not adequately secured, it can lead to breaches that compromise privacy, expose individuals to identity theft, or result in unauthorized access to confidential information. Moreover, inadequate data security practices can erode trust in AI technologies and lead to legal and ethical violations. Thus, educators must emphasize the importance of safeguarding data and adhering to strict security protocols to prevent misuse and ensure ethical AI use.
- **Deepfakes and Hallucinations:** Deepfakes and AI hallucinations undermine the trustworthiness of information and can lead to serious ethical dilemmas. Deepfakes, which involve the manipulation of videos or images to create highly realistic but false representations, can be used to spread misinformation, manipulate public opinion, and damage reputations.

AI hallucinations, where AI systems generate content that appears accurate but is entirely fabricated, can spread false information that users might mistakenly trust. These technologies can be particularly harmful in educational contexts if students are not equipped to critically evaluate the reliability of AI-generated content. Therefore, it is crucial for educators to teach students how to recognize and respond to these issues, fostering an ethical approach to AI use that prioritizes accuracy and integrity.

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. teachai.org/toolkit
2. Diebold, G., Han, C., & CENTER FOR DATA INNOVATION. (2022). How AI can improve K-12 education in the United States.
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Appendix

Artificial Intelligence Literacy for Educators

Skills and Aptitudes for Educational Roles

Educational Role	Aptitudes	Knowledge and Skills
Teacher	Always learning – flexible thinking around technology. Flexible use of platforms: teachers need to be flexible with platforms so their students can be flexible with platforms. Adaptability: Willingness to learn and adapt to new AI technologies as they evolve. Teachers need to incorporate these tools in their instruction so students are equipped for their future careers and lives. AI is a tool that can be used to enhance instruction – not as a replacement for teachers. AI is a powerful tool when combined with powerful instructional design and strategies. AI is a tool that can support student learning. All technology adapts and changes over time. We need to be flexible in adapting this change to our teaching and learning.	Understand that AI models make predictions based on a large amount of data, and those models are not infallible and can amplify existing harm to different communities. Understand AI's full potential, what it is and is not, and how to efficiently and ethically use AI tools and prompts to plan effective instruction. Plan powerful teaching and learning that uses AI as a tool and supports students to learn about and use AI ethically and efficiently. Develop a general understanding of AI tools and their uses and risks with the flexibility to translate knowledge to other tools (such as remaining program agnostic). Understand how AI tools work and how to integrate them into the curriculum. Develop an understanding of where AI tools source their information and how to support students in citing information gained from AI platforms or products generated with AI. Understand how AI does and will affect their content area and future careers in that content area. Use AI-generated data from instructional and assessment programs to inform and design instruction. Communicate AI and tech needs for the classroom to school and district leaders. (up and down communication). Communicate the importance of learning AI to students and parents. (sideways communication).

Appendix

Artificial Intelligence Literacy for Educators

Skills and Aptitudes for Educational Roles

Educational Role	Aptitudes	Knowledge and Skills
School and District Leader	Provide teachers with ongoing job-embedded PD with support- time to discuss challenges, successes, and concerns. Set expectations for teachers to use and incorporate new platforms and tools into their instruction. Commit to using AI to help students be prepared for their future careers and lives. AI is a tool that can enhance instruction—not as a replacement for teachers. To do this, students will need to use AI effectively and ethically. All technology adapts and changes over time. We must be flexible in adapting this change to our teaching and learning.	Adopt new platforms into the school to model the use of AI and help teachers become familiar with them. (program agnostic) Clearly communicate boundaries for using AI and privacy concerns with school and district data and student data. Communicate AI and tech needs to the district and/or school board. (up and down communication). Communicate the importance of learning AI to students and parents. (sideways communication).

Hess' Cognitive Rigor Matrix

Several frameworks, such as Bloom's Taxonomy and Webb's Depth of Knowledge, provide a means of defining cognitive demand for students. Hess' Cognitive Rigor Matrix combines these frameworks and gives means for classifying the cognitive demand of student assignments and tasks in both the depth of knowledge dimension (factual, conceptual, short-term strategic thinking, and extended strategic thinking) and the cognitive process dimension (Bloom's Taxonomy: lower-order thinking skills to higher order thinking skills). An example of one of Hess' Cognitive Rigor Matrices is provided below. Matrices for other subjects can be found at
https://www.karin-hess.com/cognitive-rigor-and-dok

TOOL 1

HESS COGNITIVE RIGOR MATRIX | READING-LISTENING CRM

Integrating Depth-of-Knowledge Levels with Bloom's Cognitive Process Dimensions

Revised Bloom's Taxonomy	DOK Level 1 Recall and Reproduction	DOK Level 2 Skills and Concepts	DOK Level 3 Strategic Thinking or Reasoning	DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	o Recall, recognize, or locate basic facts, terms, details, events, or ideas explicit in texts o Read words orally in connected text with fluency and accuracy	Use these Hess CRM curricular examples with most close reading or listening assignments or assessments in any content area.		
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, compare–contrast, match like ideas, explain, construct models	o Identify or describe literary elements (characters, setting, sequence, etc.) o Select appropriate words when intended meaning or definition is clearly evident o Describe or explain who, what, where, when, or how o Define or describe facts, details, terms, principles o Write simple sentences	o Specify, explain, show relationships; explain why (e.g., cause–effect) o Give non examples or examples o Summarize results, concepts, ideas o Make basic inferences or logical predictions from data or texts o Identify main ideas or accurate generalizations of texts o Locate information to support explicit-implicit central ideas	o Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference) o Identify or make inferences about explicit or implicit themes o Describe how word choice, point of view, or bias may affect the readers' interpretation of a text o Write multi paragraph composition for specific purpose, focus, voice, tone, and audience	o Explain how concepts or ideas specifically relate to other content domains (e.g., social, political, historical) or concepts o Develop generalizations of the results obtained or strategies used and apply them to new problem-based situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	o Use language structure (pre-, or suffix) or word relationships (synonym or antonym) to determine meaning of words o Apply rules or resources to edit spelling, grammar, punctuation, conventions, word use o Apply basic formats for documenting sources	o Use context to identify the meaning of words or phrases o Obtain and interpret information using text features o Develop a text that may be limited to one paragraph o Apply simple organizational structures (paragraph, sentence types) in writing	o Apply a concept in a new context o Revise final draft for meaning or progression of ideas o Apply internal consistency of text organization and structure to composing a full composition o Apply word choice, point of view, style to impact readers' or viewers' interpretation of a text	o Illustrate how multiple themes (historical, geographic, social, artistic, literary) may be interrelated o Select or devise an approach among many alternatives to research a novel problem
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)	o Identify whether specific information is contained in graphic representations (e.g., map, chart, table, graph, T-chart, diagram) or text features (e.g., headings, subheadings, captions) o Decide which text structure is appropriate to audience and purpose	o Categorize or compare literary elements, terms, facts or details, events o Identify use of literary devices o Analyze format, organization, and internal text structure (signal words, transitions, semantic cues) of different texts o Distinguish: relevant–irrelevant information; fact or opinion o Identify characteristic text features; distinguish between texts, genres	o Analyze information within data sets or texts o Analyze interrelationships among concepts, issues, problems o Analyze or interpret author's craft (literary devices, viewpoint, or potential bias) to create or critique a text o Use reasoning, planning, and evidence to support inferences	o Analyze multiple sources of evidence, or multiple works by the same author, or across genres, time periods, themes o Analyze complex or abstract themes, perspectives, concepts o Gather, analyze, and organize multiple information sources o Analyze discourse styles
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique	"UG"—unsubstantiated generalizations = stating an opinion without providing any support for it!		o Cite evidence and develop a logical argument for conjectures o Describe, compare, and contrast solution methods o Verify reasonableness of results o Justify or critique conclusions drawn	o Evaluate relevancy, accuracy, and completeness of information from multiple sources o Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns or structures, generate, hypothesize, design, plan, produce	o Brainstorm ideas, concepts, problems, or perspectives related to a topic, principle, or concept	o Generate conjectures or hypotheses based on observations or prior knowledge and experience	o Synthesize information within one source or text o Develop a complex model for a given situation o Develop an alternative solution	o Synthesize information across multiple sources or texts o Articulate a new voice, alternate theme, new knowledge or perspective

SREB

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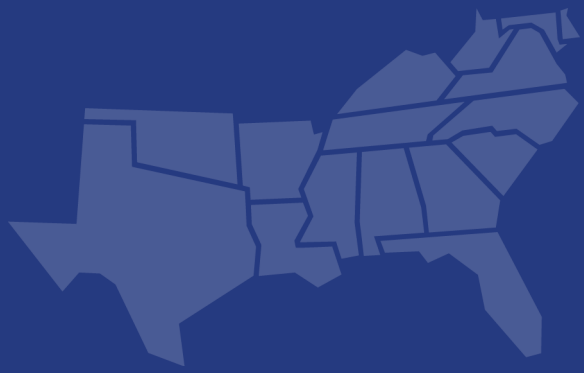

The Southern Regional Education Board works with states to improve education at every level, from early childhood through doctoral education and the workforce. An interstate compact and a nonprofit, nonpartisan organization based in Atlanta, SREB was created in 1948 by Southern governors and legislatures to advance education and improve the social and economic life of the region. SREB states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.