



AI IN AFTERSCHOOL: Exploring the Good, the Bad, and the Age-appropriate

Artificial Intelligence (AI) is no longer the product of a far-off dystopian future; in fact, AI systems have been influencing everything from our viewing queues and our political choices to our purchasing habits for years. Today, although AI programs are available for anyone to use, the question remains: what is the best way to use AI? We find ourselves asking this question not only in terms of how AI is applied to the way we work, live, and interact as a human species on this planet, but also, and perhaps most importantly, in the realm of education. Most of us do believe that the children are our future, and that, as Whitney Houston’s “Greatest Love of All,” declares, our job is to “teach them well and let them lead the way.” But in what is essentially the era of the wild, wild west of AI; do we know what we’re doing?

This article will look at some of the benefits and challenges of AI in education and share how educators around the country are finding developmentally appropriate ways to approach AI in their classrooms and out-of-school time (OST) programs.

The Benefits

While researching the benefits of AI in education for K-12 learners, in addition to reading scholarly articles and following the latest research, this author decided to go straight to the source: I asked AI. And, not surprisingly, it made a compelling argument for itself. (Open AI, [2024]).

AI shared that AI can be used for a variety of education-related tasks. Today, in classrooms and OST programs, AI is being used as a tool for personalized learning, giving real-time feedback to student work, streamlining administrative tasks for teachers and program leaders, and providing data-driven insights to educators, among other things. Studies have shown that providing teachers and program leaders with real-time analytics from AI about student learning and behavior can improve learning and help narrow the gap in learning outcomes for students (Holstein, et al., 2018).

Today, educators across the globe are integrating AI programs like DreamBox, Khan Academy, Lexia, and Lightsail into classrooms and OST programs with the

goal of improving reading, math, and other skills. These programs have the capacity to differentiate instruction to many students at once, helping teachers to meet more students where they are, faster. This saves teachers and OST providers some precious planning time, adding one more tool into their toolbox when it comes to addressing differentiated learning. Educators can utilize AI programs to automate scheduling, track attendance, and even send out reminders and updates to parents via email or text, freeing up teacher and OST leader time, energy, and resources to focus on their students. Research shows that educators who use AI tools like ChatGPT in their programs may free up additional time with their students by automating tasks (Alshater, 2022).

The Challenges

When discussing the potential pitfalls of AI in education, the challenges are many. AI programs collect a large quantity of data from the kids who use them, creating the potential for long-term, disastrous effects in the event of a data breach or misuse of this information. Educators should receive training to add to their instructional toolbox around the danger of entering personal or confidential information into generative AI applications. Detailed and extensive legislation for privacy concerns related to students and the use of AI is still minimal, and so data collection and privacy are yet to be fully policed. Organizations and districts; however, are moving quickly to develop policies to address this issue.

Another concern when discussing how AI can affect our future generations is quality control. The quality of AI content is only as good as the data and programming behind it. An AI program that is poorly designed can provide inaccurate and even inappropriate content which can confuse and misinform students and families. Along similar lines, AI programs have the potential for biases. Dylan Losey, assistant professor of mechanical engineering at Virginia Tech University shares, “In practice, rushed applications of AI have resulted in systems with racial and gender biases. The bad of AI is a technology that does not treat all users the same” (Gonzalves et al., 2023). The content that AI programs produce cannot be accepted at face value as pure fact; rather, the content can only be as unbiased as both the programmers who create the AI program and the content that it learns from. AI programs have the potential to perpetuate biases when not corrected.

How students directly interact with AI programs can also be a challenge. One of the biggest concerns permeating schools and OST programs now is the impact AI may have on the development of students’ critical thinking skills. Will an abundance of AI programs in schools and OST programs promote an overreliance on technology and result in under-developed critical thinking skills in our future generations? K-12 is a crucial time where children and young adults can try, fail, and try again in

developing analysis, evaluation, inference, problem-solving, and creative-thinking skills. Will they still have these same opportunities to learn and grow throughout their school years if AI programs are delivering packaged questions and answers?

Lastly, with increased emphasis on machine learning and technological change in the last 20 years, social and emotional learning (SEL) is more relevant in education than ever. But are we in danger of backtracking now with AI? The European Journal of Education shares that, “the use of data-driven AI technologies to model and measure these [SEL] skills... can lead to major social challenges that have important implications for educational policies and practices” (Tuomi, 2022). AI can’t provide empathy, compassion, understanding and respond to the complexities of children’s emotional worlds in learning. Likewise, dependence on AI machines in a classroom or OST setting can erase important social interactions children have that allow them to learn and practice critical life skills like teamwork, self-awareness, social awareness, and the ability to regulate one’s emotions.

Age-appropriate Uses of AI

Today’s kindergarteners will be graduating in 2037; a future that is most likely populated by AI technology. It’s certain that students will need to have advanced technology skills to succeed in a future workforce; however, AI for children is relatively new and uncharted territory. As we learn how to effectively integrate AI into classrooms and OST programs, it’s wise to contemplate: how can we introduce AI skills to children in a way that supports healthy child development? Early elementary, upper elementary, middle school, and high school aged children all have very different developmental processing needs and capacities. Due to these different stages of brain development and emotional maturity, each age group will require different approaches to learning about and working with AI systems.

Early Elementary

In early elementary, or K-2, experts agree that the core concept children need to understand about AI is that it is not a real person. Education Week reported on this phenomenon sharing, “kindergartners through second graders are at a point in their brain development where they are more likely to attribute human qualities to artificially intelligent technologies like smart speakers and chatbot. ...One study of 3–6-year-olds found that some young children believe that the smart speakers in their house have their own thoughts and feelings” (Prothero, 2024). Having conversations with young children to help them become aware that an AI device is not like a trusted friend can help young children to contextualize AI experiences. Teachers and OST providers can highlight how a conversation with a chatbot is different than a conversation with a friend

or family member. Dr. Tiffany Munzer (2024) from the American Academy of Pediatrics advises educators and caregivers to “draw examples from your own life so that [children] gain a sense of how to practice online safety.”

Upper Elementary

Children in grades 3-5 are working hard to develop their problem-solving skills, and research points to this being a way to engage children in upper elementary, albeit monitored, with AI programs. Fifth grade teacher at Ted Hunsberger Elementary in Reno, NV, Aaron Grossman, “has a smart speaker in his classroom and encourages students to ask it simple and specific questions he’s confident the technology will answer accurately- such as the definition of a spelling word” (Prothero, 2024). Because Grossman has taught his students how to use this tool to develop their problem-solving skills, he has more time to spend with his students.

Middle School

By middle school, children will have had quite a bit of experience with AI in the classroom, OST settings, and beyond. Middle school is a time where teachers and OST providers can start to have conversations with their students around the ethical uses of AI and begin to broach topics like privacy, bullying, and bias, says Dr. Munzer. Children at this age are going to explore AI no matter what. Creating a curriculum that teaches middle school aged children how to responsibly use AI can help children to become more discerning in their use of AI tools. However, child development psychologist and associate professor at Barnard College Tovah Klein shares that middle school is a time for parents, teachers, and OST providers to resist the temptation to loosen restrictions on AI too much. She says, at this age, “sexual content is very interesting, and rumors are very interesting. On the other hand, if you’re passionate about whales or how railroads are built, there’s a ton of information out there and you don’t want to stop children from having access to it. It’s a matter of really considering, what are the guardrails and limits?”

High School

High school teachers and OST providers are coming up with myriad ways to get ahead of the curve and teach responsible use of AI to their students. High school teacher Shelby Scofield stopped her planned curriculum and decided instead to teach a class on responsible use of AI. In her class, Scofield discussed core questions each student should have and be able to answer about AI. Questions ranged from “How do I find out if sources are generated by AI or are legitimate?” to “What is paraphrasing and when does it cross the line?”

Scofield also focused on teaching her students extensively about ChatGPT because it’s free and thus easy to access. She promoted open and transparent discussions with her students about AI and its uses. “Based on the results I saw after my unit I would classify it as a success. Now my students ask me questions before they use an AI website. Because I was open about AI and its benefits, my students now feel free to approach me with their questions and concerns about the technology” (Scofield, 2023).

AI Is a Tool

Every technological tool is just that – a tool. It is neither inherently good nor inherently bad. As educators, the task falls to us to teach future generations how to understand, interact with, and use artificial intelligence responsibly. A hammer can be used to destroy an object or to build something great. It’s critical to approach AI with caution in education, to model its ethical use, and be mindful of age-appropriate interactions with it. “We’re preparing kids for a world that we have no idea what it will look like in 10, 20 years,” says Dr. Munzer. “The most important things we want our children to take from us right now are kindness, equity, and critical thinking skills to challenge the information that they are seeing. It’s about imparting those key skills” (Prothero, 2024).

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