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AI IN EDUCATION: Innovating Environmental Education for the Next Generation

Today’s children are inheriting one of the most environmentally precarious futures our planet has ever faced. With escalating global challenges — such as changes in climate, declining biodiversity, the pollution of our oceans with radioactive and toxic chemicals, along with widespread pesticide and fertilizer use that contaminates our water, soil, and air — future generations are poised to confront significant environmental crises.

This reality underscores the urgent need for robust environmental education programs for our youth. The Haudenosaunee (Iroquois) people believed that each generation serves as a custodian of the Earth, emphasizing that “the decisions we make today should result in a sustainable world, seven generations into the future” (Indigenous Corporate Training Inc., 2020). Living in harmony with the land, they understood the importance of connecting with nature.

However, today’s youth often lack the opportunity and impulse to spend meaningful time outdoors, making it

essential to create activities that foster a love for and understanding of our planet. As Jacques-Yves Cousteau famously said, “We only protect what we love, we only love what we understand, and we only understand what we are taught” (Cousteau, n.d.).

While artificial intelligence (AI) can never replace the intrinsic value of direct experiences in nature, it can significantly enhance our ability to track, categorize, and analyze environmental data. This article will explore various AI tools and programs that teachers and out-of-school-time (OST) providers can integrate into their environmental education initiatives.

By facilitating informed decision-making and fostering global environmental research, AI has the potential to empower both current and future leaders to build a more sustainable future. When used in harmony with the natural beauty of our planet, AI can inspire children and adults alike to reflect, imagine, and take action for the well-being of the next seven generations.

AI in Citizen Science

Citizen science has emerged as a powerful way for young people to engage with environmental issues while contributing to real-world research. Studies indicate that citizen science initiatives can enhance young people's capacity and commitment to future conservation efforts (Ballard, Dixon, & Harris, 2017).

AI programs are now being integrated into citizen science, interweaving technology and AI with the majestic beauty and power of nature, giving students opportunities to utilize data collected by AI programs while learning about the environment in a hands-on, interactive way.

Teachers and OST providers are using platforms like iNaturalist to give children the opportunity to document and identify plant and animal species using AI-driven image recognition. Scientists then record this data to help make new discoveries and observations, and new species continue to be discovered through this project (Lee, 2024).

Zooniverse offers projects where students can classify data from various scientific fields, such as tracking wildlife through camera trap images. Hands-on activities for older students — like building a simple AI model to analyze local water quality or creating a nature journal app— can further enhance their learning experience.

Programs such as Citizen Explorer encourage students to participate in local environmental monitoring efforts, where they can collect data on air quality or biodiversity in their communities. These projects not only foster a deeper understanding of ecological principles but also empower students to contribute meaningfully to environmental research, bridging the gap between technology and nature.

AI in Conservation

Students can engage in fun and exciting conservation efforts thanks to the integration of AI into environmental education. AI-powered tools can monitor endangered species, track poaching activities, and restore natural habitats (JetLearn, 2024).

Diane Peterson's fourth grade class disproved scientific hypothesis about the horned frog in Washington by using AI-infused methods like telemetry and digital mapping to track their habitats (Petersen, 2005).

Through apps like Wildlife Insights, children can participate in monitoring endangered species by analyzing camera trap images using AI algorithms. This not only helps in tracking wildlife populations but also allows students to learn about species behavior and habitat needs.

Additionally, platforms such as Earth Rangers empower kids to take part in conservation projects, where they can contribute to wildlife protection campaigns and track their impact using AI tools that analyze data and visualize outcomes.

Teachers and OST providers can facilitate hands-on projects by guiding students in using AI to develop conservation plans for local ecosystems, such as creating a digital map of local flora and fauna or analyzing local habitat conditions.

By integrating these AI initiatives into their curricula, educators can inspire the next generation to become proactive stewards of the environment, fostering a sense of responsibility and agency in conservation efforts.



AI in Weather Changes

AI is playing a pivotal role in weather education, allowing students to explore meteorological concepts in engaging and interactive ways. By utilizing AI-driven platforms, students can access real-time weather data, analyze patterns, and even make predictions about future conditions. (Teachflow, 2023).

Apps like Weather Underground provide detailed forecasts and visualizations, empowering students to track local weather changes and understand the factors influencing them (Schild, 2016).

Through hands-on activities like creating weather reports or analyzing historical climate data, teachers and OST providers can help students develop critical thinking skills while fostering a deeper appreciation for the complexities of our atmosphere.

Students can explore historical weather data, satellite imagery, and climate models using AI-powered tools, allowing them to investigate weather patterns, climate trends, and the impact of climate change on different regions.

Integrating these AI resources into the classroom not only enhances students' understanding of weather but also prepares them to become informed citizens capable of responding to climate-related challenges.

Tools for Change

As we look to the future of environmental education — and the future of our planet — the integration of artificial intelligence offers new opportunities to engage students in meaningful ways. By incorporating AI into citizen science, conservation efforts, and weather education, educators can create dynamic learning environments that inspire curiosity and foster a deep connection to the natural world.

These technologies have the potential to enhance students' understanding of critical ecological concepts as well as empower them to take active roles in addressing environmental challenges that humanity faces today and will continue to face in the years to come.

As teachers and OST providers continue to provide opportunities for environmental education in nature, as well as integrate new AI tools, they can equip the next generation with the knowledge, skills, and heart necessary to become informed stewards of the planet.

This can nurture a sense of responsibility and agency in our youth, laying the foundation for generations that desire to protect and preserve the Earth for future generations.



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