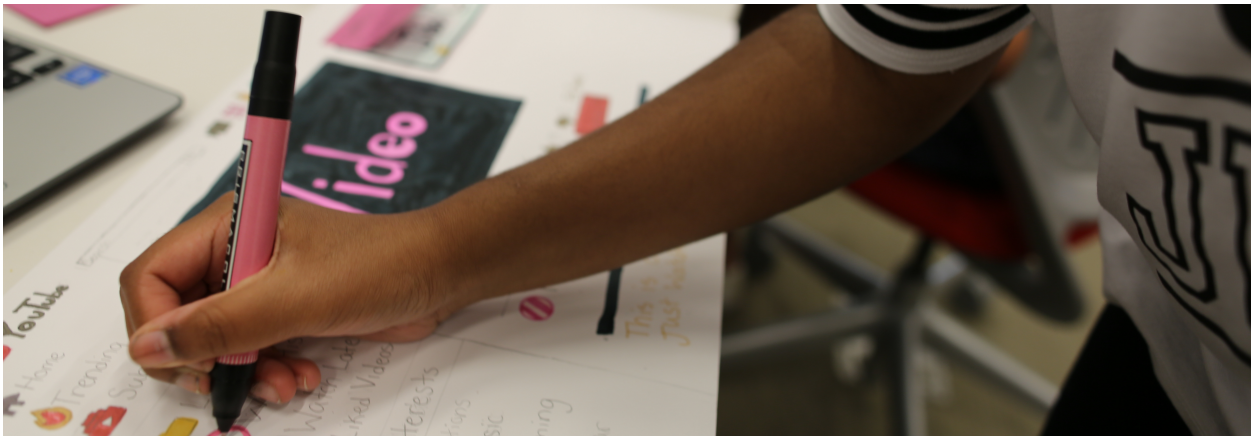
Inclusive AI for k12



Dear Parents and Students at Dubai Heights Academy,

We at the Massachusetts Institute of Technology (MIT) are very excited to have the opportunity to collaborate with the teachers and students at DHA to develop and trial an exciting, new project-based learning curriculum for middle school students. The project is called "Inclusive AI Literacy for K12". We will be doing this work with DHA over the next three years. The program will focus on a very important STEM topic that is transforming society—artificial intelligence (AI). You probably have heard about it in the news and media—both the exciting solutions and applications that it enables, but also concerns about how it might affect people in unintended ways. Today's reality is that if you are using online web services, mobile apps, smartphones, social media, etc., you are already interacting with AI-powered systems and technologies. We want to prepare students to learn to take control of AI technologies and become ethical designers and conscientious users. The job opportunities for those with competence in AI are already growing rapidly worldwide across diverse industries and markets, and the future is very bright for students who have skills in computational thinking and artificial intelligence.

To help prepare students at DHA to be successful in the AI-powered present and future, we take the approach of "learning-through-making"—otherwise known as Constructionism. Students in this program shall be active learners who will work with other students on creative projects that have personal meaning and tie into their community and social good. In this way, students not only learn technical skills and concepts in AI and computational thinking, but they also learn important teamwork and 21st-century skills such as collaboration, communication, problem-solving, critical thinking, and design thinking. They will be building computational projects using student-friendly coding platforms like Scratch and App Inventor, both invented at MIT!

We will introduce Y6 and Y7 students to an initial set of learning modules focusing on computational thinking in the 2020–2021 academic year. Over time, we will deepen our offering for Y7 to include more AI Literacy modules while we also expand the curriculum to Y8--Y9 as DHA expands its offering. We anticipate students will do these activities on average one session per week during students' Computer Science class. Sessions will be led by the DHA Computer Science teacher and a MIT mentor (once hired) per the class schedule. At the end of this three-year period, our goal is to have a full academic year project-based learning AI curriculum for grades Y7–Y9. If all goes well, we will then expand to other grade bands, with the ultimate goal to serve the entire student body of DHA (plan TBD).

As this curriculum is under development, we will be iterating and revising these materials using feedback from students and teachers. We will also welcome student and teacher input to make sure these activities are relevant and engaging for everyone. Perhaps the most exciting part is that all this hard work will result in a curriculum that can be used by other students all over the world! We want to make sure it supports a diversity of learners who have a range of interests, learning needs, and styles. Working directly with teachers and students is critical during this innovative development cycle, and everyone will come away with a better understanding of how programs like this are created for global impact. We anticipate that this adventure will impart enduring learnings and experiences that will benefit students well into the future.

Not only are we helping children learn about AI, we will also be exploring how AI-enabled technologies strengthen children's learning skills. Specifically, we will be exploring how socially interactive robots can support personalized learning in early childhood, focusing on communication and early literacy skills. This aspect of the project will start in the 2021-2022 school year. The robot is designed to play educational games with children, which can enhance or augment what children naturally gain in the classroom. Importantly, the robot is not designed to replace or compete with teachers. Rather, it should be viewed as a fun and engaging practice partner, especially for children who need additional support. Teachers will be able to track children's progress with the robot, and the information the robot provides to teachers can also be useful.

We will be doing this more exploratory work in an informal and voluntary after-school setting. The robot will not be in classrooms during instruction time. At MIT we've been able to show significant learning improvement in things like vocabulary and early literacy skills by having the robot automatically personalize its interactions with children, responding to their learning needs. We've also seen children with various learning needs respond well to a playful, almost pet-like, learning companion. We want to make sure that the robot is a polite and socially inclusive playmate —so we will be developing new capabilities for the robot to interact with small groups (parent-child-robot or child-child-robot). We will also be investigating and exploring the use of technologies like augmented reality that can link digital learning to children's active learning in the real world. As part of this program, we will be collecting speech data from young children (with their parents' permission) so that the robot can get better and better at understanding what young children say. By the end of this three-year exploration, we hope to have developed a social robot learning experience that can be piloted and evaluated for efficacy in the next phase of the project.

All of the projects that MIT does in collaboration with DHA will be subject to MIT's Institutional Review Board approval to ensure the ethical and responsible treatment of people as research participants. We will be asking parents who wish to participate to grant informed consent to allow their child to participate in this research collaboration. Participation is completely voluntary. Children or their parents can decide to stop their participation at any time.

You can learn more about the Inclusive AI Literacy for K12 on MIT's project page, https://aieducation.mit.edu/inclusiveai. On the broader aieducation.mit.edu website, you will find prior learning modules (see Learning Units) that we have developed and will be adapted for this Project as we continue to develop new ones. You can also see our published articles and news stories on our work in developing AI Literacy skills for K12 students.

We are very excited to be working together on this important and impactful Project and are looking forward to hearing your feedback and ideas!

Sincerely,
Cynthia Breazeal
Professor and Associate Director
MIT Media Lab