



ARTIFICIAL INTELLIGENCE FOR FLORIDA'S K-12 LEARNERS

PROFESSIONAL DEVELOPMENT IN AI FOR K-12 TEACHERS

Florida is among the first states to adopt a K-12 artificial intelligence education program designed to prepare its youth for the growing global demand for an AI-enabled workforce. Educators are the key to preparing students to thrive in a world where artificial intelligence is an integral part of their lives and careers. UF faculty from the Herbert Wertheim College of Engineering and the College of Education have been at the helm of designing the framework for the Florida public-schools' AI coursework, modeling it after the National Science Foundation's national guidelines for teaching AI in elementary and secondary schools. The goal is to increase students' knowledge of AI and their awareness of how AI is used in their everyday lives. With artificial intelligence ubiquitous in our everyday lives, it is essential to make AI learning accessible to K-12 students.

Despite AI's increasing impact in society, our nation is just beginning to think about how to introduce AI to K-12 students, many of whom interact with the technology through AI-interfaced toys, smart phones, Alexa and Siri. In May 2018, the Association for the Advancement of Artificial Intelligence (AAAI) and the Computer Science Teachers Association (CSTA) formed a joint working group to develop national guidelines for teaching K-12 students about artificial intelligence. Inspired by CSTA's national standards for K-12 computing education, the AI for K-12 guidelines would define what students in each grade should know about artificial intelligence, machine learning, and robotics. The AI4K12 initiative, founded and chaired by a UF researcher, is developing national guidelines for AI education, creating an online, curated resource directory of AI teaching tools, as well as building a community of collaboration between practitioners, researchers and tool developers.

When today's K-12 students join the workforce, demand will continue to increase for employees with skills in AI, machine learning, data analytics, and other specialties. The World Economic Forum anticipates that AI alone could create 97 million new jobs by 2025.

ESTABLISHING AN AI FRAMEWORK

UF is establishing a broad and long path of AI learning opportunities for students, beginning with kindergartners, by first establishing the framework for the learning standards for AI courses to be taught in Florida's K-12 classrooms. This includes:

- » Specifying course descriptions, learning standards and benchmarks
- » Ensuring that state learning standards are met, especially in computer science
- » Outlining courses that a student needs to earn a certificate or credential
- » Establishing the standards for K-12 teachers to meet Florida Department of Education (FDOE) certification to teach AI, including providing guidance on lesson plans and instructional resources

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DEVELOPMENT OF AI CURRICULUM

With no teaching materials available for AI instruction at the statewide or national levels, UF faculty have been helping build a diverse repository of AI curriculum resources that can be embedded into an inclusive curriculum, not merely robotics and data science. UF is developing standards for four courses to meet Florida AI teaching standards for state certification:

- » **AI in the World (1)** » **Applications of AI (2)**
- » **Procedural Programming for AI (3)** » **Machine Learning (4)**

The first course, Artificial Intelligence in the World, helps students identify AI in the world and how it works. In the second course, students begin looking at how AI is used in different fields to solve problems and potentially create their own AI systems to address issues they are passionate about. In the third and fourth courses, students can dive deeper into AI content that could be the foundation for AI skills in their careers. Three school districts in the state – Orange, Osceola and Broward counties’ districts – are piloting this AI curriculum with more Florida school districts considering the curriculum for the 2023-24 school year.

EXPERIENTIAL LEARNING

To support classroom instruction, UF is partnering with community-based organizations to create and deliver AI afterschool programs and summer camps to enhance student engagement and showcase the many ways AI is present in their lives. According to Intel, Corp., the top skills that employers see as rising in prominence in the lead up to 2025 include critical thinking and analysis as well as problem-solving. AI education can promote critical thinking and spur emotional intelligence as students explore AI applications in everything from healthcare to agriculture.

TEACHER TRAINING AND ASSESSMENT

UF has been partnering with the Florida Department of Education to provide professional development (PD), coaching and assessment in AI for educators who are and will be teaching AI. The professional development includes seminars, workshops and learning modules that will begin summer 2023 to

Participating in the pilot professional development program for upskilling public-school teachers in artificial intelligence is the Orange County Public School District, one of the largest public school districts in the nation.

Build the AI curriculum in an inclusive and intentional manner considerate of the diversity of school districts and resources available.

targeted districts. The 80-hour PD is offered via boot camps, professional learning communities and individual coaching to existing teachers and to college students enrolled in teacher-preparation programs. School districts participating in the pilot PD are Orange County Public Schools, Miami-Dade County Public Schools, and Hillsborough County Public Schools. Educating will continue to occur annually until 2025. Each year the University of Florida will educate four new school districts.

In summer of 2022, teachers from various school districts in the state, as well as from Florida Virtual School, participated in workshops to teach AI, making Florida among the first in the nation to provide professional development AI coursework to educators free of charge. The workshops were developed and taught by UF’s faculty and students. The summer education program provided the foundation for the FDOE to add a three-year program of study named AI Foundations to its Career and Technical Education Program, or CTE. Additionally, UF hosted three, weeklong AI bootcamps, with teachers from 11 Florida school districts attending.

In the fall of 2022, AI educating of teachers continued with a two-day symposium hosted by UF to public-school teachers from 27 Florida districts.

UF’S COMMITMENT

UF’s mission is to be the nation’s first AI University, to educate the AI workforce, and to strengthen our nation’s economy and national security. UF’s inclusive and comprehensive model to educate K-12 teachers can serve as a model to any school district in the nation. Furthermore, UF has embedded AI Across the Curriculum for its undergraduate students and is graduating thousands of UF students annually who have benefited from AI learning in all majors. UF’s commitment extends further by strengthening AI resources throughout the state with partnerships with other institutions of higher learning and private-sector organizations. The university also provides several certificate programs as well as a micro-credential in artificial intelligence, along with career prep in AI through its nationally ranked Career Connections Center.