Organizing State-Level Efforts for K-12 AI Education

Birds of a Feather * Thu 16 Mar 2023 6:30 - 7:20  *Location: 701B

Christina Gardner-McCune  
University of Florida

David Touretzky  
Carnegie Mellon University

Bryan Cox  
Georgia Department of Education

Charlotte Dungan  
The AI Education Project

Dianne O'Grady-Cunnif  
Maryland Center for Computing Education
Mission

● Develop national guidelines for teaching AI in K-12
  ○ Modeled after the CSTA standards for computing education.
  ○ Progression Charts for four grade bands: K-2, 3-5, 6-8, and 9-12
    ○ What should students know?
    ○ What should students be able to do?

● Develop a curated AI resource directory for K-12 teachers

● Foster a community of K-12 AI educators, researchers, and resource developers
BOF AGENDA

Propose Discussion Topic Ideas (As people arrive) [5 mins]
Overview of the session [3 min]
Brief Update on Current State Progress [5 mins]
Vote on Discussion Topic Groups [5 mins]
Break up into small groups [2 mins]

Small Groups [20 mins]
  ● Introductions
  ● Topic discussion
  ● Next Steps

Large Group Share out [10 mins]

Join at
slido.com
#2106 698
GOALS

● Community Building
  ○ Meet up for state workshop participants
  ○ Welcome and connect newcomers

● Talk about your K-12 AI work,
  ○ form collaborations,
  ○ share successes, and discuss issues with building the framework of implementation.

● Learn about K-12 AI efforts that are underway in their state and connect with their state leaders.

● Attendees from states with no efforts underway can learn about resources to start a state team and begin planning.
State of K-12 AI Education in Your State
2023 Updates

#AI4K12

Funded by National Science Foundation award DRL-1846073. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.
2021 “State of AI Education In Your State” Workshop

141 Participants

27 States
3 Territories

15 State Completed Plans (Jan)
CA, CT, FL, GA, HI, IL, IN, MD, MA, MS, NC, OH, PA, SC, TX,

2 New State & Territories
Completed Plans
NM, VA
Puerto Rico, Virgin Islands

- 16 States are currently advancing their K-12 AI Implementation Plan
- 5 States developed CTE AI Course frameworks

With funding from National Science Foundation ITEST Program (DRL-1846073)
K-12 AI Education
Progress to Date - Student & Teacher Impacts

**AI State Standards**
- NC, ID
- Future: FL, IL, VA

**14+ State Teacher PD**
- CA, NJ, NC, SC, GA, TX, FL, MD, HI, VA, WI, NM, PR, US/VI
- (not including PD offered by NSF Grantees)

**Elementary, Middle, & High School AI Courses**
- MD - Fall 2021 - middle school pilots
- GA - Spring 2021 - Middle School
- OH - 9th Grade Curriculum
- IN - elementary school AI integration

**450 Summer Camps**
- 48 states, 53% Offered in 8 states
- CA, NY, TX, CO, PA, MA, MD, WA, and VA. (2021 data)

**6 CTE Frameworks**
- CA, GA, FL, AR, MD, NM
- Future - Hawaii, SC, IN

**ELA, SS, STEM, Art Integration of AI**
- MD, CA, FL, NSF Grantees
Progress to Date - Building Infrastructure

Building Infrastructure

- Stakeholder surveys (FL)
- State Team & Partnership building (all)
- Community Engagement & Awareness
  - NC - Listening Sessions
  - E.g., Hawaii - Presented AI4K12 Initiative to the fifteen (15) complex area Computer Science Teams.
  - CA - Inspirit AI gave a CSTA presentation on teaching algorithmic bias

Course Development & Resource Gathering

- GA - Middle & High School AI Course Offering
- FL - High School Pathway
- MD - Video Playlist, shared exemplar lessons
- MA - Developed the first AI & Ethics curriculum for Middle School
- Developed the first AI curriculum for MA STEM Week
- Developing a comprehensive middle school curriculum on Responsible AI for Computational Action
- NC - Online teacher PD & student curriculum

16 States Actively Working on Bringing K-12 AI ED
Over 250 MD educators have participated in MCCE AI education events in MD.

Symposium attendees:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dianne O'Grady-Cunniff</td>
<td>Maryland Center for Computing Education at the University System of Maryland</td>
<td>Director</td>
</tr>
<tr>
<td>Elissa Hozore</td>
<td>Maryland State Department of Education</td>
<td>CS Specialist</td>
</tr>
<tr>
<td>Gretchen LeGrand</td>
<td>Code in the Schools. Runs PD.</td>
<td>CEO</td>
</tr>
</tbody>
</table>
Maryland Center for Computing Education

• Activities/progress
  ■ Workshops for CS teachers and across subject areas
  ■ Defining a microcredential stack to earn a badge for AI education.
  ■ Districts have developed CTE pathways and offer an intro in middle school. Harford: Techquity/Daily AI; PG: Amazon Future Engineers CS2
  ■ AI Symposium, YouTube Channel on AI

• Issues/challenges
  ■ Most challenging year yet for teacher exhaustion & turnover
  ■ Organizing and dispersing resources.
  ○ Opportunities for collaboration
    ■ Help define where CS/AI/data science and other emerging technologies converge and differ. Especially at the K-9 level to lay a common foundation.
    ■ Offering credit for micro:credential workshops
    ■ Supporting AI across content areas

Resource https://drive.google.com/drive/folders/19HzUsHSUcmHTUfQunAgvcMix0A8sbr20 - lessons
Big book of CS content - Teachable machine https://teachablemachine.withgoogle.com/
North Carolina - CS4NC ECEP Chapter

- Activities/progress
  a. AI4NC, a committee that is a part of CS4NC, was set up in March 2021.
  b. NC is adding a CS graduation requirement.

- Issues/challenges
  a. Definition of CS is broad enough to include AI… but so broad it includes engineering, data entry tools, and the kitchen sink.
  b. State certified classes may not be high quality. They have a low threshold for including coding due to constraints at the district level for certified or even qualified teachers.
  c. No preservice programs. Yet.
  d. No funding.
  e. Schools integrating AI are typically using free curricular resources such as ai4k12, aiforteachers.org and aiedu.org within core classes or after the CSP exam.
Georgia State Updates

- High School **AI pathway** approved
- AI4GA grant was funded by NSF to create curriculum and PD for middle school AI instruction
  - Exploring existing curriculum to include in project
- Middle School AI course standards out for public review
  - [www.gadoe.org/computerscience](http://www.gadoe.org/computerscience) (please review them for us!!!)
- AI task force plans to meet again after the semester ends/transitions
- [Georgia Public Broadcast Video](http://www.gadoe.org/computerscience) on the 5 Big Ideas (by a middle school AI teacher)
Florida

- Stakeholder meetings (FLDOE, UF, school districts, economic development, state workforce boards, philanthropic foundations, state colleges, technical colleges, and industry)
- Developed industry AI workforce survey, collected and analyzed responses
- Piloted Summer ‘21 camp with support from UF, CareerSource Central Florida and OCPS
- Submitted 4 course CTE framework for high school students
  https://www.fldoe.org/core/fileparse.php/20062/urlt/9401100-2223.rtf
- In discussions with FLDOE to pilot teacher PD program with a handful of districts
- Secured funding to support one district's development of AI related content in K12 (Okaloosa)
Florida

- Developed AI Foundations (Fall 22 Orange County) and Data Science (Fall 23 Okaloosa County) frameworks for K12 CTE.

- Building AI curriculum in an inclusive and intentional manner considerate of the diversity of districts and resources available (ongoing).

- Implement a comprehensive teacher professional development plan around AI Education (ongoing - year 1 of 2 year program).

- Support co-curricular, community based and afterschool programs that reinforce AI concepts in programming offered (ongoing).

- Effectively communicate and engage industry, communities, families, educators & administrators in AI Education (ongoing).

- Additional programs being developed at the Postsecondary level to integrate the K20 system.

For More Information contact - Christina Gardner-McCune
● Include learners with disabilities into the broader discussion of equity in K-12 AI and CS education
● Highlight integration of culturally responsive pedagogies and Universal Design for Learning in CS and AI education
● Integrate modules on equity-focused AI education within our CS certificate in the pedagogy course sequence
● Co-constructing and collaborating with practice partners in Florida: Broward County Public Schools, PKY, Miami Dade, STEM2Hub, etc.
● PKY as a model demonstration site for a K-12 scope and sequence of equity-focused CS and AI education pathways.
● Partner with researchers, developers and curriculum creators to test and implement AI programs at PKY
● **Design informal AI education summer camp experiences** (Morning presentation)

For More Information contact - Maya Israel
CS Updates

- A new CS Coordinator started in February 2023
- Awaiting state guidelines on use of $15M funding for CS teacher credentialing

Awareness

✅ Inspirit AI gave a CSTA presentation in July on teaching algorithmic bias
✅ Came up with Hour of AI for May
✅ Drafted a Getting Started Guide
👀 Reach out to CA state level math, science, language arts, organizations to present the AI literacy & Five Big Ideas.
👀 Incorporate CS+Env Lit and Data Science available from UCSD
👀 AI CTE pathway
✅ Created and implemented Day of AI PD (online; May 2022, December 2022, May 10, 2023)

Community

✅ Organized leadership of 11 CSTA chapters
✅ We’ve been meeting monthly!
✅ Create AIforCA website and logo
👀 CSTA chapter outreach: draft an offer of AI sessions that we can give to all 11 chapters.
👀 Identify how to leverage future industry partners, and reach out to potential industry partners.

Accessibility

✅ Collect resources for AI in CA
👀 Create crosswalk among the Five Big Ideas in AI, CA CS standards, and other core subject areas. <seek funding
👀 UCSD undergraduates working on creating projects/lessons using the AI-robot kit
👀 UCSD AI Literacy course (AY 2023-24)
👀 UCSD Pathway2AI group is working on creating AI video series to promote the understanding of AI technology applications among teachers and students (focused on high school)
👀 Stanford AI Literacy group is working on creating high-school curriculum materials
2021: A committee met with Illinois State Board of Education over the last 2 months to write new CS standards. A sub committee met to organize a beta version of a toolkit that will include emerging technologies, such as the AI4K12 framework. The beta version toolkit will be open to teachers. Committees will meet to update and revise the toolkit over the next 3 years, once it is complete and formalized, then it will go to the board to be approved and adopted.

Next steps: March 2nd, the CS standards will be presented to the Board and made available for public comment. Then moved forward to get approval and adopted by the board. This process should be completed by the summer and ready for teachers to use the beginning of next school year.
Indiana

Updates:
● Finalizing AlforIN Plan and adding dates for 2021
● AI professional development opportunities on calendar for elementary and middle school
● Work related to K-8 standards updates and CTE pathway development is underway
New Mexico’s Initiatives

1. CS Summit Oct 15 & 16
   a. Welcome NM Sec of Education
   b. 150 teachers
   c. DS/ ML learning
2. CS endorsement to be announced by end of year
3. New CS specialist position filled for K-8- getting up to speed
4. NSF Grant - Culturally Relevant Pedagogy for CS- Micro Credentialing
5. New CS Pathway Courses Art and CS, Cybersecurity….advanced topics
6. Planning for AI PD in June 2022
New Mexico’s Initiatives

1. CS Summit  Oct 2021
   a. Welcome NM Sec of Education
   b. 150 teachers
   c. DS/ ML learning
2. CS endorsement to be announced by end of year
3. New CS specialist position filled for K-8- getting up to speed
4. NSF Grant - Culturally Relevant Pedagogy for CS- Micro Credentialing
5. New CS Pathway Courses Art and CS, Cybersecurity….advanced topics
6. Planning for AI PD in June 2022
Pennsylvania’s AI work is happening under the umbrella of our existing CS work, which is part of our PAsmart Initiative.

- Reviewing standards
- Informal and formal discussions
- New advisory think tank
South Carolina (The Citadel)

● **Activities/progress**
  1. SREB formed a committee to create AI standards for high school mapped onto current CS standards
  2. “Integrating AI” PD will be offered for K-8 teachers during SC’s CSPDWeek in July 2023

● **Issues/challenges**
  1. State funds have been allocated for AI but bureaucracy is causing issues.

● **Opportunities for collaboration**
  1. As we grow our community of educators interested in AI, we would love to connect them to other communities.
Activities/progress:

a. Development of a collaborative and comprehensive professional development for (40 - 50 educators) with ISTE course and post-secondary partnership

b. Plans for the development of secondary for AI course during the Computer Science Standards revision process

c. Plans to embedded/align AI standards with K-8 computer science standards during the Computer Science Standards revision process.

Issues/challenges:

a.

Opportunities for collaboration:

a. Expert council and collaboration during the development of AI standards for secondary course
Making K-12 AI Education a reality will require:

- Building Teacher Capacity
- Providing Ongoing Teacher Professional Development
- Developing AI Curriculum & Resources
- Building a community of teachers to share experiences and effective practices
- Exploring cross-curricular connections between AI and other disciplines
- Fostering School, Industry, and Community Partnerships
Broader K-12 AI Education Community

- **AI4K12** (662 Mailing list subscribers as of Jan. 2021, 475 Twitter Followers)

- **Researchers** (CS, AI, STEM Education, & Policy, NSF ITEST, DRK-12, AISL, RETTL, CSforAll)

- **State & District Administrators** (E.g., department of educations, STEM coordinators)

- **K-12 Educators**

- **Curriculum & Professional Development Providers** (e.g., AI4ALL, ECS, AI in Schools, MIT RAISE, research projects, AI Education Project, commercial vendors, state)

- **Tool Developers** (e.g., Google, Microsoft, MIT, ML4K, Microsoft, Code.org)

- **Professional organizations & Standards & PD** (CSTA, ISTE)

- **Partnerships** - University, Community Colleges, Workforce Development & Industry

- **Informal Learning providers**

- **Policy** (e.g., AI Education project, Code.org)

- **Broader CS Education Movement** (e.g., CSForAll, ECEP)

- **Governmental agencies** (e.g., OSTP, DOD, National Academies)

- **State & Federal Workforce Development**

- **International efforts**
AI4K12 Community Updates

Certiport High School AI Exam

The AI exam will be included with our IT Specialist Certification program. The full Objective Domains are available when you click on the AI menu choice.

https://certiport.pearsonvue.com/Certifications/ITSpecialist/Certification/Overview

Day of AI - dayofai.org
May 13, 2022
MIT & i2Learning

- Modeled after Hour of Code
- Free teacher training for a 4 hr AI Literacy curriculum in 3 grade bands (upper elementary, middle school, high school) provided by i2Learning.
- Year 1 - MIT is providing the initial curriculum & US focused audience
- Year 2 - Open to other contributors starting next year & Global audience
Vote for Discussion Topic Group

Start presenting to display the poll results on this slide.
Discussion Topic Groups

Small Groups [20 mins]

● Introductions
● Topic discussion
  ○ Activities/progress
  ○ Issues/challenges
  ○ Needs/Opportunities for collaboration
● Next Steps

Large Group Share out [10 mins]

Big Group Shareout

How do we give teachers a coherent message about

- Limited resources - time

Standards - what are the learning objectives for actives

All Five Big Idea Progressions are available.
Includes

- Books and Reports (Adults)
- Children’s Books
- Competitions
- Curriculum Materials
- Demos
- Online Professional Development Courses
- Online Courses for K-12 Students
- Reference Sources & Tutorials
- Resource Directories
- Software Tools & IDEs
- Videos

Please send us resources you want to share with teachers!
How can you get involved?

- **Join** our mailing list and become part of the AI4K12 Community
- **Review** the draft Grade Band Progression Charts & provide feedback
- **Find out** what is happening in your state
- **Volunteer** to help your local school district learn about AI
- **Make** your research accessible to K-12 students

It’s time for all of us to think about AI in K-12.