

## CS Education Keys to Implementation (District Level)

### *Establishing a New K-12 Discipline*

Computer Science (CS) education is on the way to becoming a central discipline in our local and national school system. Computational thinking (CT) at the primary level and computer science courses at the secondary level are part of a transformative dynamic in education that some states and districts are getting out ahead on as innovators and early adopters. In Georgia, our governor has repeatedly expressed a special interest in growing computer science education, both for the Georgia economy and to prepare our youth for future success in each and every career field. Some districts would like to make decisive steps towards incorporating computer science as a fundamental part of the curriculum but are unsure of where to begin. What follows is not a step-by-step prescription but rather a generalized guide of the things to address during this process. Each district will not follow each step in a prescribed order. Some districts will focus on teacher capacity before curriculum development and that's fine. Again, this is just a guide to help districts identify key components of moving the ball towards an equitable and ubiquitous CS for All.

Additional questions may be directed to GADOE Computer Science Specialist Bryan Cox: [bcox@doe.k12.ga.us](mailto:bcox@doe.k12.ga.us)

#### I. **Establish a Computer Science Vision and Agenda**

- What is your vision for CS in your district?
- Determine a current baseline (enrollment data in CS courses, demographics, etc; contact [Bryan Cox](#) at the state if need be).
- What are your goals for computer science in your district? (Goals should be measurable such as a percentage increase in student enrollment in classes, enrollment increases, ensuring every high school offers CS courses by a certain school year, etc.)
- Where will CS be housed? Which department?
- Look at the state CS Plan on the GaDOE website to align efforts.
- Develop a district CS plan.

#### II. **Build your CS Team:**

- Who will drive the CS initiative? Find your leaders, innovators, and champions - (innovative and energetic principals, teachers, academic coaches, counselors, board of education members, or parents in your district).
- You will need a broad team to withstand turnover at the teacher and leadership levels.
- Identify industry partners, both local and national. They will be instrumental when time to build advisory boards and inform the team about workforce demands.
- Include professors from local Universities, Community, and/or Technical Colleges.



- III. **Join the conversation:** Connect with people inside and outside your district who are invested in promoting CS education. There are local, state, and national groups that may have resources, support and advice that would benefit you on your journey.
- ☐ [Edweb links](#) – The department of education has created local online communities to bring computer science education stakeholders together. Join; have your teachers, parents and administrators join (look on the right sidebar of the GaDOE CS page).
  - ☐ [CS4All](#) – there is a national CSforAll movement that brings together stakeholders from all over the country. You can join the consortium as a district.
  - ☐ CS4GA – Georgia has a statewide collective impact effort for developing CS education. CS4GA.org. Join the movement!
  - ☐ Identify and engage industry partners in your area that can provide support and advice for your efforts.
- IV. **Explore existing models:** No matter where you are in the process, there are others you can learn from right here in the state. Take time to visit some schools and districts that are either ankle, knee, or waist deep in developing CS education.
- ☐ Douglas County – has declared CS for all schools at all levels within their district
  - ☐ Centennial Academy – has integrated computational thinking via project-based learning into their entire elementary and middle school curriculum.
  - ☐ DeKalb County – has decided to introduce one of the CS pathways at every high school within the next year or two.
  - ☐ Thomas County – recently received a GOSA grant and a Middle School CS4GA grant to improve CS education in their district.
  - ☐ Kennesaw Mountain High School – has an innovative course pairing. For their STEM magnet program, they've combined 9<sup>th</sup> grade literature with Introduction to Digital Technology, the first course in most IT/CS pathways. Every student going through that program is exposed to CS.
  - ☐ Several districts (APS, Douglas County, Thomas County, Brooks County, and Ben Hill County) are participating in an NSF grant in partnership with CS4GA and the DOE to develop an implementation plan for K-12 CS based on Rural, Urban or Suburban context.
- V. **Build teacher capacity:** One of the most glaring challenges is the number of qualified teachers able to teach CS courses. Recruiting and preparing teachers to teach CS is an imperative step towards student CS exposure.
- ☐ Identify teachers that are open to teaching a new pathway or extending an existing one.
  - ☐ Identify and recommend PD for certification, CS content, and CS specific pedagogy.
  - ☐ Increase administrator and counselor awareness of CS graduation credit.
  - ☐ Explore the best route for teacher credentialing: a CS Endorsement or the add-on GACE assessment.



- VI. **Identify and support pathways (H.S.) and programs:** GaDOE offers 9 CS pathway options with a 10<sup>th</sup> under development. Districts may identify which they wish to support and focus on (Programming, Game Design, Cybersecurity, et). Some districts have out-of-school programs operating in their district that may be able to supplement CS exposure and instruction in places where teachers have not been identified or trained.
- ☐ Visit GaDOE pathway [website](#).
  - ☐ Identify curriculum options: [GAVS](#), [code.org](#), etc.
  - ☐ Identify out-of-school programs to support your efforts at bridge gaps. Resources for identifying these programs and their alignment with in-school curriculum are under development but you can start with the United Way, the Blank Foundation and CS4GA.org.
  - ☐ Organize meetings around vertical alignment including teachers from Elementary, Middle, and High schools as well as curriculum leaders from the district level.
- VII. **Develop an approach for elementary grades:** While the secondary level has a plethora of course options to choose from, the challenge of addressing the diversity issues within CS are rooted in the elementary grades. There are two approaches that districts can support separately or together.
- ☐ District wide technology curriculum for “specials” (elementary extra-core classes) – Adopt a comprehensive, developmental progression curriculum for teachers to follow when they take their classes to the computer lab. It can be guided by the Technology teacher if the school has one, a media specialist, or by the core teacher, requiring little to no prior CS or CT experience.
  - ☐ Integration – The more challenging but also more effective and rewarding method for instilling strong computational thinking in all our students is integrating CT into the overall school curriculum and culture. If a school is already aiming for STEM or STEAM, this will fit in nicely with that transition.

Our local, national, and global society is in sore need of both CS professionals and non-CS professionals with CS knowledge and understanding. Health care, security, banking, transportation, entertainment, sports, education, every industry has a need for this universal skill set and literacy. Every student in Georgia needs to learn to think computationally to face the challenges of life. Let's give them the tools to build the future.

