# Missouri
## 2020 State of Computer Science Education: Illuminating Disparities

Computer science education is more important than ever. The COVID-19 pandemic has highlighted our society's reliance on computing and its power to help businesses innovate and adapt, yet at the same time has surfaced greater disparities for students studying computer science. Computing is the number one source of all new wages in our economy, and there are currently 400,000 open computing jobs across the United States. Yet the U.S. education system does not provide widespread access to this critical subject.

Although access to computer science is key to addressing the equity issues in society, only 47% of our nation's high schools teach foundational computer science. In addition, students from marginalized racial and ethnic groups, students in Title I schools, and students from rural areas are less likely to attend a school that provides access to this critical subject.

States are working to broaden participation in computer science by passing policies to make computer science a fundamental part of the K–12 education system. In addition to adopting more policies, state education leaders extend and i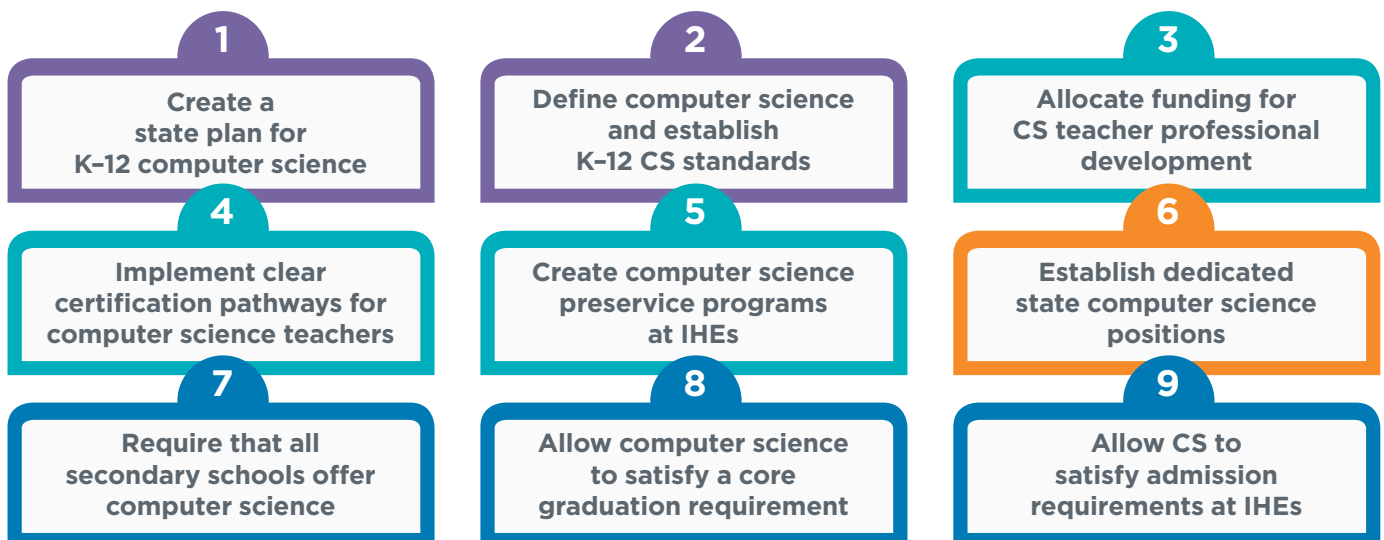nnovate on previously adopted policies: continuing to fund computer science education, supporting teachers and students, and providing leadership and guidance.

States that have adopted more of these nine policies have a larger percentage of high schools teaching computer science. States that have funded K–12 computer science professional learning have higher implementation rates than states that have not provided direct funding.

In the last 12 months, **28** states have adopted a total of **42** policies

Pursuing an access agenda to K–12 computer science provides policymakers a rare opportunity to address equity, workforce, and education issues on a bipartisan basis. All nine policies can promote access to and equity within rigorous and engaging computer science courses when stakeholders make equity an explicit focus on policy development and implementation monitoring.

## Nine Policies to Make Computer Science Fundamental

**1** Create a state plan for K–12 computer science

**2** Define computer science and establish K–12 CS standards

**3** Allocate funding for CS teacher professional development

**4** Implement clear certification pathways for computer science teachers

**5** Create computer science preservice programs at IHEs

**6** Establish dedicated state computer science positions

**7** Require that all secondary schools offer computer science

**8** Allow computer science to satisfy a core graduation requirement

**9** Allow CS to satisfy admission requirements at IHEs

# Missouri Computer Science Policy

| | |
|---|---|
| **State Plan** <br> No | Missouri has not yet created a state plan for K-12 computer science. A plan that articulates the goals for computer science, strategies for accomplishing the goals, and timelines for carrying out the strategies is important for making computer science a fundamental part of a state's education system. |
| **Standards** <br> Yes | Missouri adopted K–12 computer science standards in 2019. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity. |
| **Funding** <br> Yes | HB 3 (passed in special session in 2018) created a Computer Science Education Fund, and HB 2 (FY 2020) allocated $450K to the Computer Science Education fund created by HB 3 (2018 special session). Grant awardees must describe how they will reach and support students from marginalized racial and ethnic groups underrepresented in computer science. |
| **Certification** <br> Yes | In Missouri, teachers can obtain a 9–12 certification through academic coursework or by passing the state content exam. Teachers can be authorized to teach computer science after completion of department-approved professional development. State funding for computer science can be used to support credentialing for teachers. |
| **Preservice** <br> No | Missouri has not yet established programs at institutions of higher education to offer computer science to preservice teachers. The computer science teacher shortage can be addressed by exposing more preservice teachers to computer science during their required coursework or by creating specific pathways for computer science teachers. |
| **CS Supervisor** <br> No | Missouri does not yet have dedicated computer science positions in state or local education agencies. Creating a statewide computer science leadership position within the state education agency can help expand state-level implementation of computer science education initiatives. Similar positions at the local level could support districts' expansion of course offerings and professional development. |
| **All HS Offer** <br> No | Missouri does not yet require that all secondary schools offer computer science. The state can support the expansion of computer science courses by adopting policies that require schools to offer a computer science course based on rigorous standards, with appropriate implementation timelines and allowing for remote and/or in-person courses. |
| **Grad Credit** <br> Yes | In Missouri, any computer science course that aligns to the standards and has an appropriately qualified teacher can count as a mathematics, science, or practical arts credit for graduation. |
| **IHE Admission** <br> No | Missouri does not yet allow computer science to count as a core admission requirement at institutions of higher education. Admission policies that do not include rigorous computer science courses as meeting a core entrance requirement, such as in mathematics or science, discourage students from taking such courses in secondary education. State leaders can work with institutions of higher education to ensure credit and articulation policies align with secondary school graduation requirements. |

Missouri has CSTA chapters and Governor Michael Parson is a member of the Governors' Partnership for K–12 Computer Science.
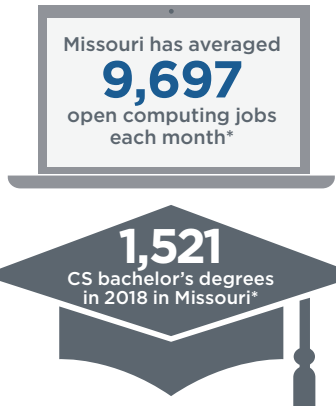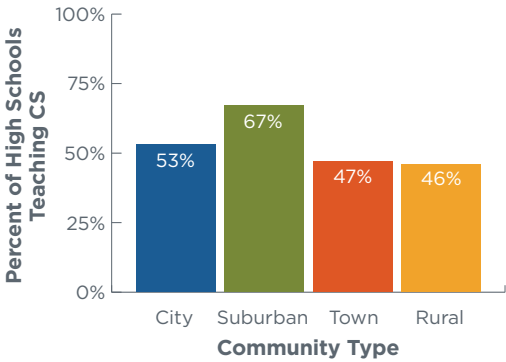
# Computer Science Access and Participation in Missouri
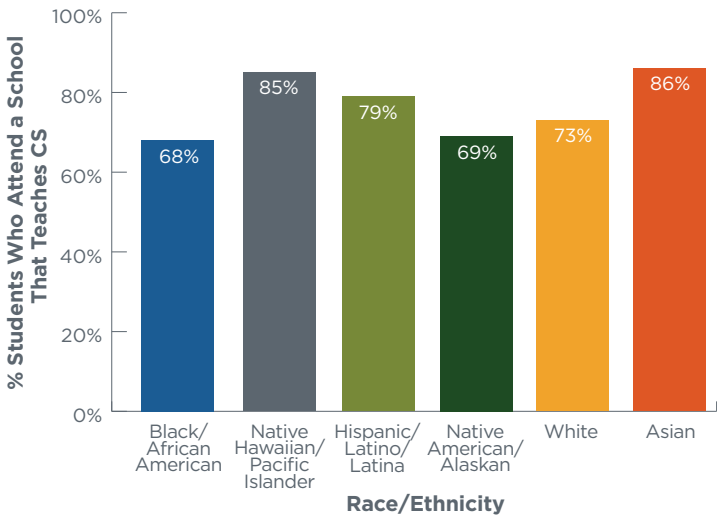
## High Schools Teaching CS



- 2017-2018: 32%
- 2018-2019: 38%
- 2019-2020: 50%
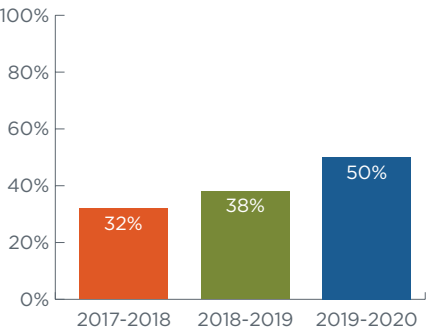
## Percent of High Schools Teaching CS by Community Type



Percent of High Schools Teaching CS

- City: 53%
- Suburban: 67%
- Town: 47%
- Rural: 46%

**Community Type**

Missouri has averaged **9,697** open computing jobs each month*
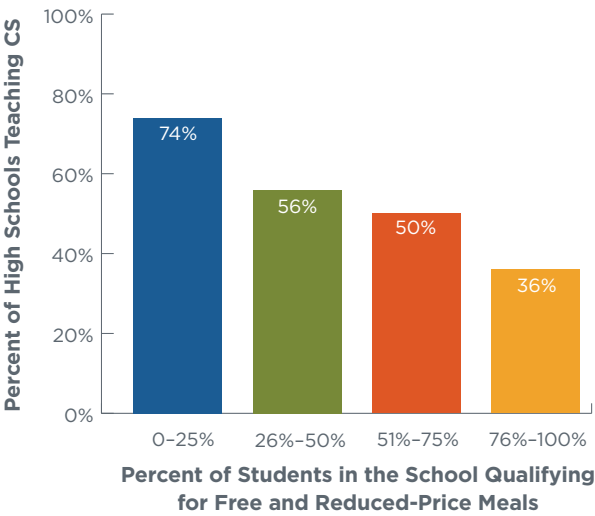
**1,521** CS bachelor's degrees in 2018 in Missouri*

* Sources: The Conference Board and the National Center for Education Statistics
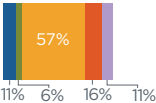
## Race/Ethnicity and Access to Computer Science



% Students Who Attend a School That Teaches CS
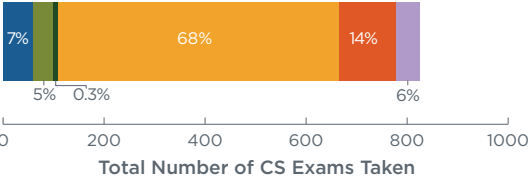
- Black/African American: 68%
- Native Hawaiian/Pacific Islander: 85%
- Hispanic/Latino/Latina: 79%
- Native American/Alaskan: 69%
- White: 73%
- Asian: 86%

**Race/Ethnicity**

## Income Level and Access to CS



Percent of High Schools Teaching CS

- 0–25%: 74%
- 26%–50%: 56%
- 51%–75%: 50%
- 76%–100%: 36%

**Percent of Students in the School Qualifying for Free and Reduced-Price Meals**

## AP CS Participation by Race/Ethnicity and Gender

### Female Students



11%    6%  57%    16%   11%

### Male Students



7%   5%  0.3%   68%    14%    6%

**Total Number of CS Exams Taken**

### LEGEND

- Black/African American
- Native Hawaiian/Pacific Islander
- Hispanic/Latino/Latina
- Native American/Alaskan
- White
- Asian
- 2+ Races/Other

## AP CS Student Participation



Female / Male

- 2016-2017: 20%
- 2017-2018: 21%
- 2018-2019: 21%
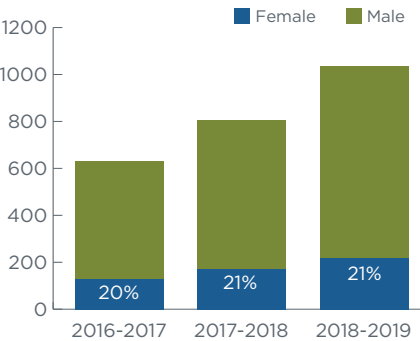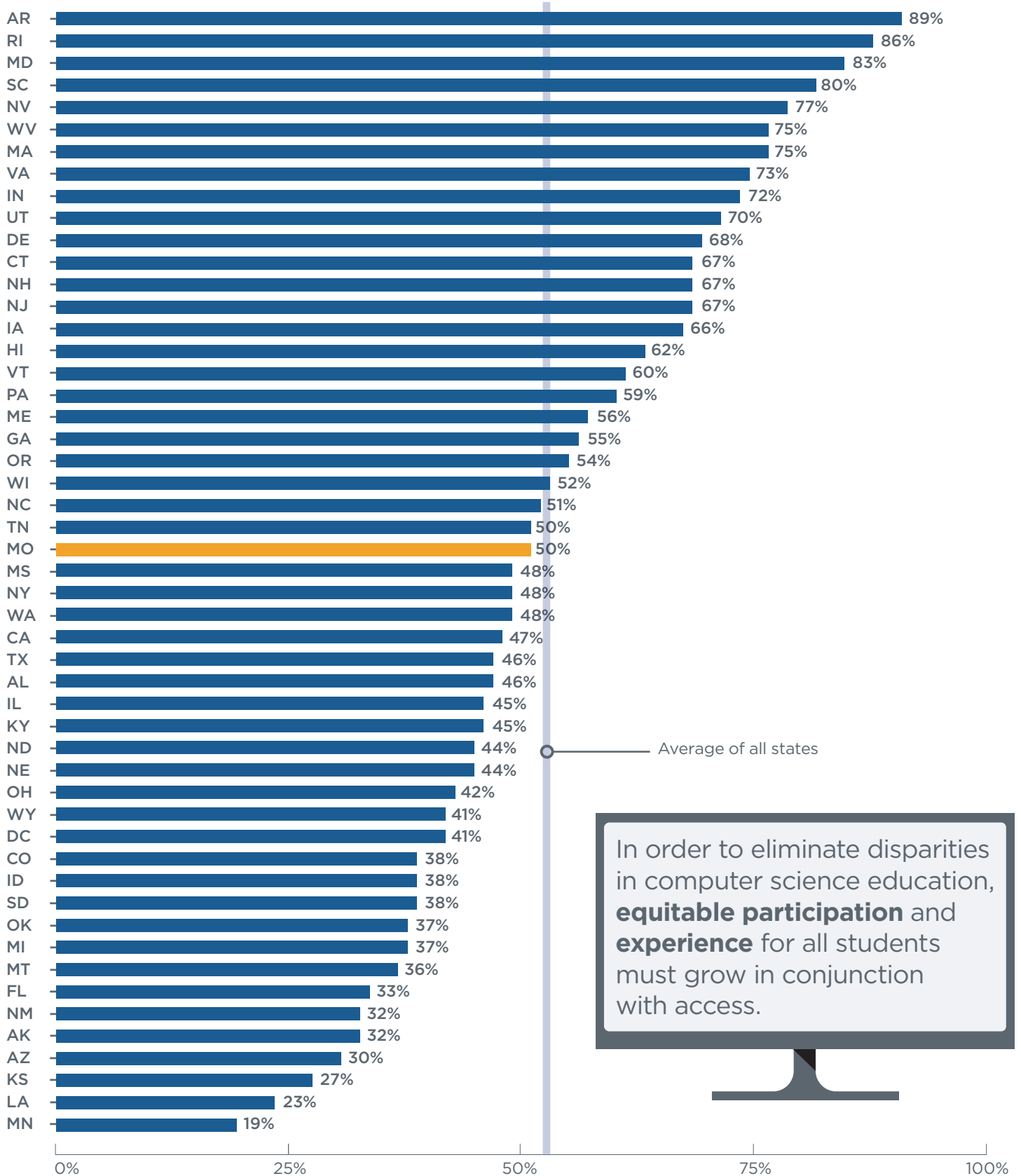
Black/African American students are 2.3 times less likely and Native American/Alaskan students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

# Percent of High Schools Teaching Computer Science by State

| State | Percent |
|-------|---------|
| AR | 89% |
| RI | 86% |
| MD | 83% |
| SC | 80% |
| NV | 77% |
| WV | 75% |
| MA | 75% |
| VA | 73% |
| IN | 72% |
| UT | 70% |
| DE | 68% |
| CT | 67% |
| NH | 67% |
| NJ | 67% |
| IA | 66% |
| HI | 62% |
| VT | 60% |
| PA | 59% |
| ME | 56% |
| GA | 55% |
| OR | 54% |
| WI | 52% |
| NC | 51% |
| TN | 50% |
| MO | 50% |
| MS | 48% |
| NY | 48% |
| WA | 48% |
| CA | 47% |
| TX | 46% |
| AL | 46% |
| IL | 45% |
| KY | 45% |
| ND | 44% |
| NE | 44% |
| OH | 42% |
| WY | 41% |
| DC | 41% |
| CO | 38% |
| ID | 38% |
| SD | 38% |
| OK | 37% |
| MI | 37% |
| MT | 36% |
| FL | 33% |
| NM | 32% |
| AK | 32% |
| AZ | 30% |
| KS | 27% |
| LA | 23% |
| MN | 19% |

Average of all states

In order to eliminate disparities in computer science education, **equitable participation** and **experience** for all students must grow in conjunction with access.