

K-12 Computer Science Education Wisconsin



This report summarizes the status of computer science (CS) education from a 2014 survey of 9,693 U.S. K-12 school principals. Topics include perceptions, opportunities and participation, as well as support and infrastructure.

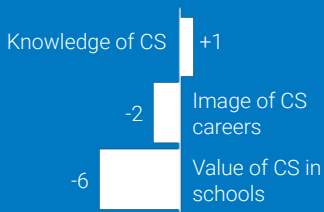
These data are from a multi-year Google-Gallup study of U.S. students, parents, teachers, principals, and superintendents.

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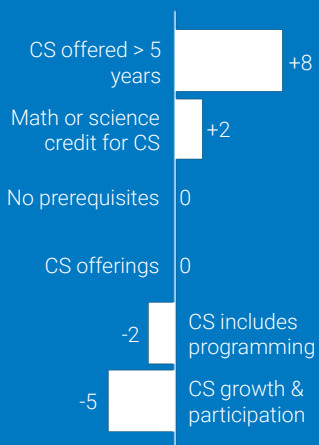
Fewer Wisconsin principals report a positive image and value of CS than the U.S. average. Less have introductory, AP, or afterschool CS; however, more have offered CS for over five years and count it as math or science. A smaller portion indicate growth, demand, and support for CS, yet more report having a teacher qualified for CS.

Values below indicate percentage point difference from the U.S. average. See back for full data tables.

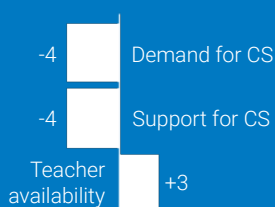
Knowledge & Perceptions



Opportunities & Participation



School Infrastructure



Background

Broadening equitable student access to computer science (CS) is critical to our future, not only because of the increasing demand created by computing-related jobs but also because it develops critical thinking to solve complex problems, creativity to foster new ideas, and skills to drive innovation. To inform progress in ensuring *Computer Science for All*, this report provides a status of CS education and recommendations for Wisconsin.

Findings

Results from the 2014-15 Google-Gallup study indicate that improvement is needed for Wisconsin schools to implement CS education for all students.

- **Most confuse CS as basic computer literacy.** In Wisconsin, only 34% of principals surveyed correctly identified computer literacy activities as *not* computer science (U.S. average 33%).
- **CS offerings are limited,** with 24% of Wisconsin principals reporting offering CS classes with programming and coding (U.S. average 26%).
- **CS offerings often appeal to and serve a subset of students.** Wisconsin principals report CS students are mostly White, and they are less often Hispanic or Black compared to the U.S. average.

To help prepare schools for CS education, the study also identified challenges to providing CS education for all students in Wisconsin.

- **Parents' demand for CS is not heard;** 91% of U.S. parents want their child to learn CS, whereas only 5% of Wisconsin principals believed there was high demand for CS (U.S. average 7%).
- **Principals perceive low school board and staff support for CS** in Wisconsin at 33% (U.S. average 37%).
- **Lack of teachers trained in CS (45%), not enough demand from parents (42%), and not enough budget for a CS teacher (40%)** were reported by Wisconsin principals as the greatest barriers to offering CS for their schools.

Recommendations

- **Differentiate between computer literacy and computer science** to ensure students not only learn to use technology, but learn to create technologies.
- **Expand CS offerings** by connecting with communities, legislators, and organizations advocating for CS.
- **Promote diverse participation** by integrating equity practices into CS pedagogy, encouraging participation through various pathways, and diversifying portrayals of CS to build confidence and identities.
- **Increase qualified CS teachers** through incentives and support of quality teacher preparation and certification.
- **Gauge demand for CS** by actively seeking input from students and parents to inform school leaders and policymakers.
- **Prioritize funding** to meet the demand for CS.

See g.co/cseduresearch for recommended resources.



Data Tables

The descriptive data tables below show responses by 327 Wisconsin K-12 principals compared to the full sample of 9,693 U.S. K-12 principals, surveyed Nov.-Dec. 2014; sample size may vary by question. Percentage point differences from the U.S. for each category were calculated from the percentages bolded below. Full methodology is at g.co/cseduresearch.

| Knowledge & Perceptions | WI | US |
|---|-----------|-----------|
| Knowledge of CS (% no to both) | 34 | 33 |
| Which of the following activities do you consider part of CS? (% no) | | |
| ...Creating documents or presentations on the computer | 35 | 35 |
| ...Searching the Internet | 47 | 44 |
| Image of CS careers (average % positive) | 85 | 87 |
| People who do CS make things that help improve lives. (% agree) | 78 | 82 |
| There are a lot of good jobs available in the U.S. for people who know CS. (% agree) | 91 | 90 |
| CS can be used in a lot of different types of jobs. (% agree) | 85 | 89 |
| Value of CS in schools (average % positive) | 65 | 72 |
| It is a good idea to try to incorporate CS education into other subjects at school. (% agree) | 67 | 70 |
| Most students should be required to take a computer science course. (% agree) | 49 | 59 |
| Do you think offering opportunities to learn CS is more important, just as important, or less important to a student's future success than (% just as/more important) | | |
| ...required courses like math, science, history and English? | 61 | 68 |
| ...other elective courses like art, music, and foreign languages? | 86 | 91 |
| Opportunities & Participation | WI | US |
| CS offered > 5 years: How long has your school offered opportunities to learn computer science? (% greater than 5 years) | 57 | 49 |
| Math or science credit for CS (% positive to either) | 15 | 13 |
| Which of the following describe how credit is given for computer science courses offered at your school? Select all that apply. (%) | | |
| ...A math requirement | 13 | 10 |
| ...A science requirement | 8 | 8 |
| No prerequisites: Do CS classes offered in your school have prerequisites? (% no) | 73 | 73 |
| CS offerings (average % positive) | 53 | 53 |
| About how many different types of CS courses are available in your school this year? (% 1+) | 53 | 54 |
| For each of the CS classes available this year, how many are (% 1+) | | |
| ...Introductory level | 93 | 95 |
| ...AP courses | 17 | 21 |
| ...Other | 51 | 44 |
| As far as you know, is CS taught as part of other classes at your school? (% yes) | 53 | 43 |
| How many school clubs or after-school activities that expose students to CS are at your school? (% 1+) | 50 | 62 |
| CS includes programming: Do the computer science opportunities offered in your school include any of the following elements? | 51 | 53 |
| ...Computer programming and coding (%) | | |

| Opportunities & Participation | WI | US |
|---|-----------|-----------|
| CS growth & participation (average % positive) | 41 | 46 |
| [Of those offering CS] In the last 3 years, has CS participation increased, stayed about the same, or decreased? (% increased) | 49 | 51 |
| In the next 3 years, will the number of opportunities to learn CS in your school increase, stay the same, or decrease? (% increase) | 42 | 49 |
| Students who learn CS: How often are students who learn CS at your school (% usually/sometimes) | | |
| ...Girls | 30 /50 | 27 /54 |
| ...White/Caucasian | 74 /20 | 60 /32 |
| ...Black/African-American | 17 /39 | 21 /43 |
| ...Hispanic/Latino | 17 /38 | 21 /44 |
| ...Asian | 24 /43 | 26 /41 |
| School Infrastructure | WI | US |
| Demand for CS (average % positive) | 22 | 27 |
| Demand for CS education among parents in your school is (%) | | |
| ...High | 5 | 7 |
| ...Increasing | 29 | 36 |
| Demand for CS education among students in your school is (%) | | |
| ...High | 12 | 14 |
| ...Increasing | 43 | 49 |
| Support for CS (average % positive) | 33 | 37 |
| CS education is currently a top priority for my school. (% agree) | 19 | 24 |
| My school board believes CS education is important to offer in our schools. (% agree) | 39 | 43 |
| The majority of teachers and counselors in my school think it is important to offer CS. (% agree) | 40 | 45 |
| Teacher availability (average % positive) | 50 | 48 |
| I could easily identify a staff member with the skills and knowledge to teach a CS course. (% agree) | 57 | 56 |
| Would you have to hire a new teacher to teach CS or is there teacher at your school could teach CS? (% there is a teacher) | 43 | 40 |
| Barriers | | |
| As far as you know, why doesn't your school offer any ways to learn computer science? Select all that apply. (%) | | |
| ...There are no teachers available at my school with the necessary skills to teach computer science. | 45 | 42 |
| ...There is not enough demand from parents. | 42 | 30 |
| ...There is not enough money to train or hire a teacher. | 40 | 44 |
| What was the largest barrier your school had to overcome to offer CS? (%) | | |
| ...There were no teachers available at my school with the necessary skills to teach computer science. | 19 | 15 |