K–12 Computer Science Education

Maryland

2017

This report summarizes the status of computer science (CS) education using data from 18,938 surveys collected in 2014–2015 and 2015–2016 from U.S. K–12 school principals.

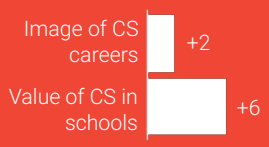
These data are from a multi-year Google-Gallup study of U.S. K–12 students, parents, teachers, principals, and superintendents.

This report: **goo.gl/UNEPcv**
All reports: **g.co/cseduresearch**

Maryland principals are more likely than the average U.S. principal to report a positive image of CS and place a value on CS education. A greater percentage have CS extracurriculars, and their overall CS offerings include programming/coding. They are more likely to indicate demand and support for CS and anticipate growth in CS opportunities.

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

Perceptions



Opportunities & Participation

School Infrastructure

State Policy as of 2017[1]

- ☐ Dedicated state funding for CS PD
- ☐ Requires all high schools to offer CS
- ☐ K–12 CS curriculum standards

[1] Source: code.org/promote

Background

Broadening equitable student access to computer science (CS) education is critical to our future, not only because of the increasing demand for qualified workers to fill 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 the public on progress made toward ensuring broad participation in K–12 CS education, this report provides results from 2014–15 and 2015–16 Google-Gallup surveys. Topics include perceptions, opportunities, support, and infrastructure. It also offers recommendations to broaden access to CS learning for Maryland.

Findings

Results from the 2014–15 and 2015–16 Google-Gallup surveys show that while perceptions of CS are increasingly positive, there is still inconsistent implementation of CS education for students in U.S. schools.

- **Positive perceptions of CS prevail** among students, parents, and educators, including 92% of Maryland principals who believe that CS can be used in many different jobs (U.S. average 88%).
- **The value of CS is high**, where 70% of Maryland principals agreed that most students should be required to take CS (U.S. average 60%).
- **CS offerings are limited**, with 58% of Maryland principals reporting offering CS classes (U.S. average 57%).
- **Growth in CS opportunities is anticipated** by 59% of Maryland principals by 2019 (U.S. average 53%).

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

- **Parents' demand for CS is not being heard**; 91% of U.S. parents want their child to learn CS, whereas only 14% of Maryland principals believe there is strong parent demand for CS (U.S. average 8%).
- **Principals perceive weak school board support for CS** in Maryland, with 44% indicating school board commitment (U.S. average 41%).
- **Insufficient budget for a CS teacher** (40%), **lack of necessary computer software** (40%), and **insufficient budget for technology** (39%) are the greatest barriers to offering CS for Maryland principals.

Recommendations

- **Promote broad, diverse participation** by taking advantage of interest and growth while integrating equity practices into CS recruitment and pedagogy.
- **Expand CS offerings** by connecting with communities, legislators, and organizations advocating for CS education.
- **Integrate CS** education offerings via flexible curricula, empowering teachers to incorporate CS into their subjects.
- **Increase qualified CS teachers** through incentives and support of quality teacher preparation and certification.
- **Prioritize funding** to meet the demand for CS education.

Google

GALLUP

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Data Tables

The descriptive data tables below show responses by 307 Maryland K–12 principals compared to the full sample of 18,938 surveys collected in 2014–2015 and 2015–2016 from U.S. K–12 school principals; 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 **goo.gl/7qwXgP**.

Perceptions	MD	US
Image of CS careers (average % positive)	**87**	**85**
People who do CS make things that help improve lives. (% agree)	83	82
CS can be used in a lot of different types of jobs. (% agree)	92	88
Value of CS in schools (average % positive)	**78**	**72**
It is a good idea to try to incorporate CS education into other subjects at school. (% agree)	75	71
Most students should be required to take a computer science course. (% agree)	70	60
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?	76	67
...other elective courses like art, music, and foreign languages?	92	90

Opportunities & Participation	MD	US
CS offerings (average % positive)	**58**	**55**
About how many different types of CS courses are available in your school this year? (% 1+)	58	57
For each of the CS classes available this year, how many are (% 1+)		
...Introductory level	97	95
...AP courses	20	18
...Other	47	47
As far as you know, is CS taught as part of other classes at your school? (% yes)	51	46
How many school clubs or after-school activities that expose students to CS are at your school? (% 1+)	74	65
CS includes programming: Do the computer science opportunities offered in your school include any of the following elements? ...Computer programming and coding (%)	**73**	**63**
CS growth & participation (average % positive)	**56**	**51**
[Of those offering CS] In the last 3 years, has CS participation increased, stayed about the same, or decreased? (% increased)	59	56
In the next 3 years, will the number of opportunities to learn CS in your school increase, stay the same, or decrease? (% increase)	59	53

School Infrastructure	MD	US
Demand for CS (average % positive)	**16**	**11**
Demand for CS education among parents in your school is (%) ...High	14	8
Demand for CS education among students in your school is (%) ...High	18	15
Support for CS (average % positive)	**40**	**36**
CS education is currently a top priority for my school. (% agree)	32	25
My school board believes CS education is important to offer in our schools. (% agree)	44	41
The majority of teachers and counselors in my school think it is important to offer CS. (% agree)	46	43
Barriers		
As far as you know, why doesn't your school offer any ways to learn computer science? Select all that apply. (%)		
...There is not enough money to train or hire a teacher.	40	48
...We do not have the necessary computer software.	40	35
...We do not have sufficient budget to purchase the necessary computer equipment.	39	37
...We do not have sufficient budget to purchase the necessary computer software.	38	36
...There are no teachers available at my school with the necessary skills to teach computer science.	37	50
...We do not have the necessary computer equipment.	37	29
...We have to devote most of our time to other courses that are related to testing requirements and computer science is not	36	48
...There is not enough demand from parents.	23	35
...There is not enough demand from students.	21	34
...There are too many other courses that students have to take in order to prepare for college.	21	23
...There is not enough classroom space.	17	18
...Internet connectivity is poor at my school.	13	10
...There are no teachers available to hire with the necessary skills to teach computer science.	11	11
What was the largest barrier your school had to overcome to offer CS? (%)		
...There were too many other courses that students have to take in order to prepare for college.	18	16
...There were no teachers available at my school with the necessary skills to teach computer science.	16	18
...There was not enough money to purchase the necessary computer equipment.	13	12

Suggested citation: Google Inc. & Gallup Inc. (2017, December). K–12 Computer Science Education: State Reports. Results From the 2014–2016 Google-Gallup Study of Computer Science in U.S. K–12 Schools. Retrieved from https://goo.gl/n7bZLs.