



Wisconsin K-12 CS Education Landscape Report

Maverick Berner / Sujeeth Ramagoni / Dr. Dennis Brylow

Motivation

A landscape report is an assessment of the current state of computer science education in Wisconsin. Issues identified in the report will be used to inform future policy decisions and CS education reform at the state-level.

Key questions to answer:

- What CS course offerings are available to Wisconsin K-12 students?
- What groups are underrepresented in terms of access to CS course offerings?
- Is there an adequate number of teachers with CS certification in the state?
- What programs for professional development are available to teachers? Are they effective?

Challenges

- Data was inconsistent, incomplete, and sometimes inaccurate
- Inconsistencies in the data required cross-referencing multiple sources to make an accurate assessment

Methodology

- Schools offering CS courses were determined by cross-referencing enrollment data from the Wisconsin Department of Public Instruction (DPI) and Microsoft TEALS as well as College Board AP exam data
- Historical enrollment data was also considered to account for schools that teach CS on a biennial basis
- Schools were compared with licensure data from DPI and demographics data from both AP and DPI

Results

■ Teacher + Enroll ■ No Teacher + No Enroll
■ Teacher + No Enroll ■ No Teacher + Enroll

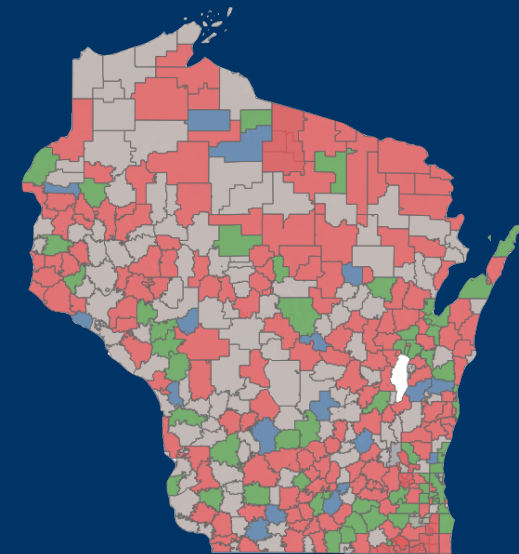


Figure 1. DPI CS enrollment based on teacher availability for each school district for 2018-19

Figure 2 shows an upward trend of high schools reporting CS course enrollment in recent years, with the exception of the 2019/2020 academic year which may have been affected by school shutdowns during the COVID-19 pandemic. The increasing number of CS course offerings further emphasizes the importance of producing new CS teachers at the high school level.

Figure 1 gives a breakdown of how our CS enrollment data compares to our CS licensed teacher data. The parts of the map colored in red highlight school districts where we see CS enrollment, but no licensed teacher. This is an indication that we have many CS teachers operating on a temporary emergency license, and that there are not enough licensed teachers to sustain the amount of CS courses being taught across the state.

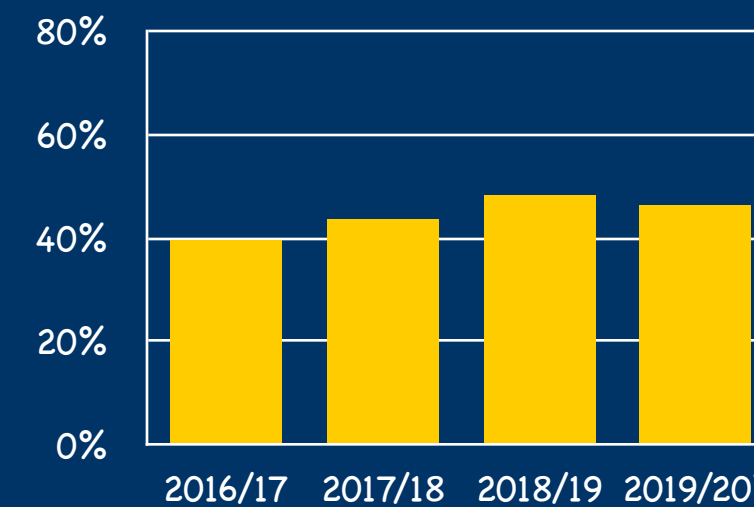


Figure 2. Snapshot of growth: percentage of high schools reporting CS course enrollment to DPI by year

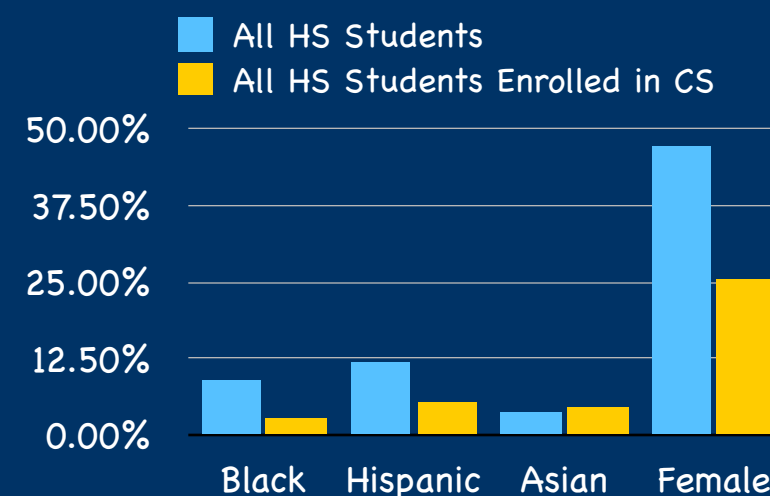


Figure 3. Disparity between representation of total student population vs. representation in CS course enrollment among underrepresented groups

Figure 3 shows that despite making up over 20% of the high school student population, Black and Hispanic represent less than 10% of students enrolled in CS. It also shows that female students account for only about a quarter of students CS course enrollment, despite representing nearly 50% of the total student population.

Conclusion

- Although CS enrollment has increased in recent years, there are still a number of regions within Wisconsin, particularly more rural areas, where students still lack access to CS education
- The number of licensed CS teachers is not enough to sustain the increasing number of CS course offerings
- Hispanic and Black students, as well as female students are underrepresented in CS course enrollment

Future Work

- Measure growth in CS education at the K-8 grade levels
- Design a system to streamline our data collection process in order to easily measure progress in CS education in years to come
- Compare results with data from Marquette's own CS professional development programs to determine their effectiveness in expanding CS education in WI

Related Work

- [Code.org Access Report](#)
- [Status of K-12 Computer Science Education in Indiana](#)
- [Building the Texas Computer Science Pipeline](#)
- [Catching Up to Move Forward: A Computer Science Education Landscape Report of Hawai'i Public Schools, 2017-2020](#)

This work was supported in part by Project {FUTURE}, U.S. Department of Education EIR grant U411C190254.