

**NEVADA DEPARTMENT OF EDUCATION
STATUS REPORT**

**Senate Bill 200
Computer Science Education
Fiscal Year 2018**

July 19, 2018



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Senate Bill 200 Overview

Purpose

Senate Bill 200, passed by the Nevada Legislature and signed into law by Governor Brian Sandoval on June 15, 2017, broadens the participation of students in computer science (CS) education. It outlines certain changes in Nevada’s Computer Education and Technology instruction to include computer science and computational thinking, applying credit in certain CS courses towards high school graduation, certain CS courses to fulfill requirements for Millennium Scholarship eligibility, establishment of K-12 Computer Science standards, teacher professional development (PD) requirements for computer education and technology, the appointment of a computer science subcommittee under the Governor’s Advisory Council on Science, Technology, Engineering, and Mathematics (STEM) to make recommendations concerning instruction, and to provide appropriations for districts to satisfy the requirements of this bill.

Background

Members of the Nevada state legislature led by Senators Woodhouse, Denis, Ford, Spearman, Cancela, Atkinson, Cannizzaro, Gansert, Manendo, Parks, Ratti, and Segerblom, including joint sponsors Assemblymen Carlton, Frierson, and Fumo, recognized the skills gap in our current computer education and technology instruction regarding computer science and computational thinking, and drafted this bill to strengthen the current computer technology education we have in Nevada and broaden it to include computer science and computational thinking practices, and to increase the equity and diversity of instruction to all students in all districts, thereby giving them greater opportunities in their future college and career paths.

Computer Science Subcommittee

A computer science subcommittee was officially created under the Governor’s STEM Advisory Council in the Office of Science, Innovation, and Technology (OSIT) in July, 2017. This [Computer Science Subcommittee](#) currently has 18 members representing OSIT, the Nevada State Board, Nevada Department of Education, Regional Professional Development Program (RPDP), Post-Secondary Institutions, and K-12 educators representing Clark, Washoe, Carson City, and Humboldt Counties.

This Computer Science subcommittee meets regularly to discuss items pertaining to Senate Bill 200 and makes decisions that impact this work. Many of these decisions are reflected in the topics to be addressed in this report. [Past subcommittee meeting minutes](#) can be accessed on the OSIT website.

In addition, a dedicated position over computer science within the Nevada Department of Education was created and filled in May, 2017. This person’s role has been to oversee computer science education initiatives in the state.

K-12 Computer Science Standards

On August 23-25, 2017, twenty-six individuals from across the state met in the Las Vegas Boardroom at the Nevada Department of Education to develop brand new Computer Science standards for grades K-

12. All counties in the state were invited to represent either the writing team or the internal review team. It was very important to the Department of Education that everyone had a voice in this process. The new standards were officially approved by the Nevada State Board of Education on June 7, 2018, completing the entire regulatory process.

The [Nevada K-12 Computer Science Standards](#) are cutting edge in that they are the first in the nation to include specific crosswalks at the elementary level of each computer science standard to the other Nevada Academic Content Standards (NVACS) - math, science, english language arts, and social studies. This one difference has made it easier for elementary school educators in particular to integrate computer science concepts into other subject areas. Other states have since replicated our approach. Nevada has become a leader in the nation for broadening computer science education through our innovative practices.

Equity and Access

Computer Science is more than just computer programming. It is computational thinking, logical reasoning, critical thinking, and problem solving. “These skills strengthen local community, national innovation, and opportunities for youth. Computer Science – not computer literacy – underlies most innovation today, from biotechnology to cinematography to national security. Yet, the majority of U.S. schools require only that students use computers. Seldom do schools prepare students to innovate and create the new technologies that drive local and national economies. This ability to innovate with technology is also important for students’ future success and ability to make a difference in a global society.” (National Center for Women in Technology, NCWIT.org)

Currently in Nevada, there are over 2,434 open computing jobs, 4.2 times the average demand rate in Nevada. ([Code.org’s State Facts Data](#)) As the statistics below will point out, Nevada has not been providing an equitable access to computer science in the past, which is creating a computing skills gap for our graduating students. The following statistics were provided by the Nevada Department of Education’s Office of Data and Accountability.

2015-2016 Statistics

Nevada had only 96 computer science graduates in 2015 and only 23% were female. Only 9 schools in Nevada (8% of schools in Nevada with AP programs) offered an Advanced Placement (AP) Computer Science course in 2015-2016; fewer than any other AP courses in a STEM field. And finally, only 104 high school students in Nevada took the AP Computer Science exam in 2016: 21% were female, only 12 students were Hispanic or Latino, only 2 students were black, no students were Native American or Alaska Native, and only 1 student was native Hawaiian or Pacific Islander. With a total student population of 132,035 in 9-12th grades, only 1,564 were learning computer science concepts. Nevada needed to do a better job at providing equitable and diverse access to computer science education to ALL of our students.

Total State CS Enrollment	Asian	Black	Caucasian	Hispanic	Native American / Alaskan Native	Mixed Races	Pacific Islander	Female	Male	Disabled
1,564	228	129	612	460	4	105	26	334	1,220	75
	14.6%	8.2%	39.1%	29.4%	0.3%	6.7%	1.7%	22%	78%	4.8%

Total State CS Enrollment cont'd	Economically Disadvantaged	ELL
1,564	618	82
	39.5%	5.2%

Nevada Department of Education's Office of Data and Accountability

2016-2017 Statistics

The 2016-2017 school year saw an increase in our high school population by 7,635 enrolled students, yet only about 11% of those students received a computer science education (810). While the Asian population increased by 5.1% for those receiving CS education, Hispanics and economically disadvantaged student percentages dropped. One promising movement shows that the female population taking computer science courses showed a 4.7% increase.

There was also an increase of 385 students taking an AP Computer Science exam over last year (160 took AP Computer Science A and 329 took the new AP Computer Science Principles exam).

- For AP CS A: 17% were female, 36 were Latino, 6 were black, 1 was American Indian or Alaska Native, and only 1 Native Hawaiian or Pacific Islander.
- For AP CS Principles: 30% were female, 89 were Latino, 12 were black, 2 were American Indian or Alaska Native, and 0 Native Hawaiian or Pacific Islanders took the exam.

Although the statistics show movement, the numbers are relatively low and may have other contributing factors associated with them. Only 27 schools in Nevada (24% of NV schools with AP programs) offered an AP Computer Science course, yet it was 18 more schools than the previous year. There are still fewer AP exams taken in computer science than in any other STEM subject area during this school year. Most disheartening is that not one college or university in Nevada had graduated a single new teacher who is prepared to teach computer science in 2016. ([Code.org's State Facts Data](#))

Total State CS Enrollment	Asian	Black	Caucasian	Hispanic	Native American / Alaskan Native	Mixed Races	Pacific Islander	Female	Male	Disabled
2,374	468	200	852	640	8	161	45	634	1,740	113
	19.7%	8.4%	35.9%	27%	0.3%	6.8%	1.9%	26.7%	73.3%	4.8%

Total State CS Enrollment cont'd	Economically Disadvantaged	ELL
1,564	837	150
	35.3%	6.3%

Nevada Department of Education's Office of Data and Accountability

2017-2018 Statistics

The 2017-2018 school year shows the first set of statistics with Senate Bill 200 being in place for half of the year and the support and resources that were provided. Our overall enrollment at the high school level in computer science courses has increased by 691 students from last year. The data also showed a change in the Hispanic population from 27% in 2016-2017 to 31.7% in 2017-2018 and a change in female enrollees from 26.7% to 30.4%. Our black and disabled enrollees remained steady from last year. Our economically disadvantaged student enrollment showed an increase from 35.3% last year to 37.2%. We are making some strides towards equity and access through our initial funding and promotion efforts, but there is still much to do to provide equitable access to computer science education for all of Nevada's students.

Total State CS Enrollment	Asian	Black	Caucasian	Hispanic	Native American / Alaskan Native	Mixed Races	Pacific Islander	Female	Male	Disabled
3065	437	244	1125	972	18	230	39	931	2134	145
	14.3%	8.0%	36.7%	31.7%	0.6%	7.5%	1.3%	30.4%	69.6%	4.7%

Total State CS Enrollment cont'd	Economically Disadvantaged	ELL
3065	1140	232
	37.2%	7.6%

Nevada Department of Education's Office of Data and Accountability

Efforts Toward Equitable Access

Although Senate Bill 200 has given high schools until July, 2022 to have a plan in place to increase the enrollment of females, students with disabilities, and underrepresented minorities in the field of computer science, many school districts and charter schools who have applied for the non-competitive funding through Senate Bill 200 have already included this plan of action in their budgets because they are beginning to understand the importance of this initiative. A Byte-Size Seminar Series was started by the Department of Education to train educators, administrators, counselors, and district leaders on the specific details and requirements of Senate Bill 200 and the purpose for broadening computer science education. Over 90 individuals from across the state attending these online trainings and the recordings were posted on the [STEMHub website](#) for viewing by others who could not attend. This format will be used in the future for state trainings on multiple topics relating to computer science education.

To help facilitate equity and access, the Nevada Department of Education's EPP who works with Counselors in the state was trained and provided resources on the new requirements in Senate Bill 200 regarding CS counting towards a math or science credit and towards the Millennium Scholarship. She was also provided with resources for counselors in the state on teaching computer science to students with disabilities.

FY18 Allocations

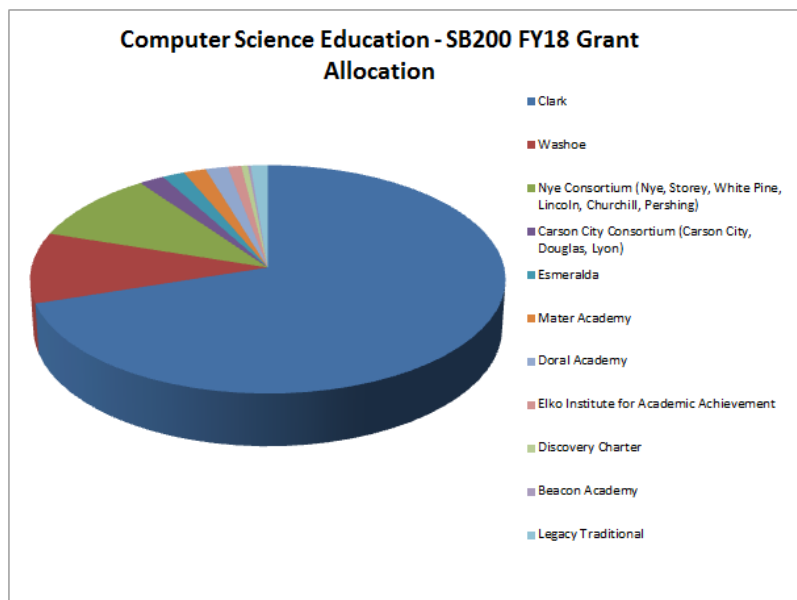
The following graph and chart show the allocated amounts that went specifically to Clark and Washoe, and then the non-competitive allocation to all rural districts and charter schools that applied for fiscal year 2018.

The emphasis for the grant application included primarily teacher professional development in the area of computer science education. Technology purchases for implementation of the new K-12 Computer Science standards were approved as long as teacher development was the main priority.

The applicants were also required to show how these funds would be used to increase enrollment of females, students with disabilities, and underrepresented minorities in computer science courses within their districts or charter schools.

Computer Science Education - SB200 FY18 Grant Allocation

District/Charter	Allocation
Clark	\$ 700,000.00
Washoe	\$ 100,000.00
Nye Consortium (Nye, Storey, White Pine, Lincoln, Churchill, Pershing)	\$ 100,701.61
Carson City Consortium (Carson City, Douglas, Lyon)	\$ 18,886.93
Esmeralda	\$ 16,783.60
Mater Academy	\$ 16,783.60
Doral Academy	\$ 16,783.60
Elko Institute for Academic Achievement	\$ 10,195.00
Discovery Charter	\$ 5,000.00
Beacon Academy	\$ 2,000.00
Legacy Traditional	\$ 12,865.66
Total FY18 Allocation:	\$ 1,000,000.00



Eligible Use of Funds

There were three uses of funds that were outlined in the application to the districts and charters. Eligible use of funds included:

- **Professional Development** that will directly impact teachers and students in ways to teach to the standards for computer science and computational thinking in the classroom; may include teacher stipends for qualified professional development. (SB200 Section 5.5)
- **Professional Development for administrators and counselors** on new graduation and college admission requirements with regards to computer science courses, teacher licensure requirements, and efforts to increase enrollment by females, students with disabilities, and underrepresented groups in the field of computer science. (SB 200 Sections 2-3)
- **Curriculum / Equipment / Professional Development** that directly ties to computer science instruction and the expansion of computer science education in all grade levels. (e.g. Robotics)

kits to be used within curriculum developed to implement the new K-12 Computer Science standards in a fifth grade math class*). (SB 200 Section 2-3) **only one example of many possible*

FY18 allocations were distributed late (January, 2018) due to miscommunication, but once the LEA's received their letters, they put the funding to great use. Final numbers will not be available until early fall. Expenditures by the districts/charters were proposed as follows:

- Beacon Academy used its funding to expand their CS courses and increase their enrollment of Hispanics, females, and special education students in computer science by 50%.
- The Consortium of Carson City, Douglas, and Lyon used its funding for extensive teacher training on the new K-12 computer science standards, in partnership with the Northwest Regional Professional Development Program (NWRPDP) - unwrapping the standards, lesson design, curricular resources, course alignment and integration.
- Clark County used its funding for technology in high need areas, coding kits for elementary, online computer science course development for locations that lack qualified teachers for computer science, teacher stipends/reimbursements for endorsement courses, and extensive professional development (PD) for K-12 teachers.
- Discovery Charter used its funding for technology (Lego Mindstorm Kits / Dash and Sphero robots) and extensive teacher training on how to incorporate computer science and the standards into all classrooms.
- Doral Academy used its funding for extensive teacher professional development on the K-12 Computer Science standards, to purchase needed technology, and teacher training on how to incorporate computer science into other core subject areas.
- Elko Institute for Academic Achievement used its funding for extensive teacher training on the K-12 Computer Science standards and technology for grades K-8 (Kinderlabs Robotics, Lego WeDo and Mindstorms) to integrate the standards into STEM related areas.
- Esmeralda County used its funding on extensive teacher training on the K-12 Computer Science standards and curriculum (CS Fundamentals and CS Discoveries), and technology for implementation (Adafruit electrical circuit kits used in CS Discoveries and STEAM CS kits).
- Mater Academy used its funding for extensive teacher training on K-12 Computer Science standards and travel to inaugural Computer Science Summit in Las Vegas, and technology (laptops) for implementation in classrooms.
- The Consortium of Nye, Storey, White Pine, Lincoln, Churchill, and Pershing used its funding for developing an aligned computer science curriculum along with maps and learning guides for all grade levels, online and on-demand teacher PD that is aligned to the K-12 Computer Science standards, and extensive teacher professional development on each of these items.
- Washoe County used its funding on extensive training provided by NWRPDP on the K-12 Computer Science standards, training and travel to the Computer Science Summit, technology and classroom resources for implementation of standards, stipends for curriculum development across all grade levels, and tuition reimbursement for courses towards teacher computer science endorsements.

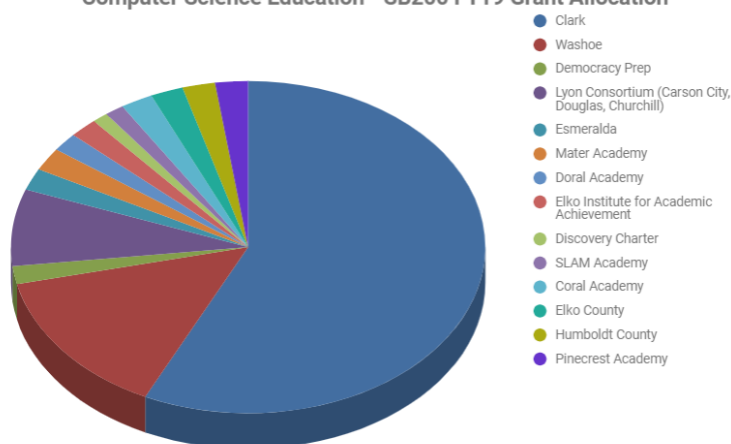
FY19 Allocations

The graph and chart below show the allocated amounts that went specifically to Clark and Washoe, and then the non-competitive allocation to all rural districts and charter schools that applied for fiscal year 2019 funding.

Computer Science Education - SB200 FY19 Grant Allocation

District/Charter	Allocation
Clark	\$ 800,000.00
Washoe	\$ 200,000.00
Democracy Prep	\$ 24,476.80
Lyon Consortium (Carson City, Douglas, Churchill)	\$ 104,648.41
Esmeralda	\$ 29,664.43
Mater Academy	\$ 31,299.09
Doral Academy	\$ 25,257.00
Elko Institute for Academic Achievement	\$ 26,899.00
Discovery Charter	\$ 15,000.00
SLAM Academy	\$ 18,338.00
Coral Academy	\$ 30,800.00
Elko County	\$ 31,229.09
Humboldt County	\$ 31,229.09
Pinecrest Academy	\$ 31,299.09
Total FY19 Allocation:	\$ 1,400,000.00

Computer Science Education - SB200 FY19 Grant Allocation



Funding uses by each LEA are pending but heavy emphasis has still been placed on extensive teacher professional development at all grade levels, the integration of the computer science standards into core subject areas, and increasing enrollment by females, students with disabilities, and underrepresented minorities in computer science.

Interest, Participation, and Outreach

Several events have helped to increase interest, participation, and outreach for computer science education initiatives.

Nevada State Computer Science Summit

On June 18, 2018, Nevada had its inaugural Computer Science Summit sponsored by a grant obtained through the Expanding Computing Education Pathways Alliance (ECEP). Over 160 attendees from across the state including district K-12 educators and administrators, counselors, superintendents, charter school representatives, UNLV, UNR, Touro University, Nevada State College, and business leaders, were able to hear first-hand about the requirements in Senate Bill 200 and receive training specifically for their roles in education. Discussions about pre-service and in-service training programs took place among our university and college professionals in attendance. Strategic plans on broadening computer science education in Nevada were developed by each district, charter, and post-secondary groups during the Summit. Those strategic plans will be compiled into a white paper and distributed to all districts, charters, and post-secondary institutions in late fall.

Comments from the Summit survey were positive and encouraging:

- “Today I learned how important it is to implement computer science skills in our classrooms. Students need communication and problem solving skills as well as the other critical thinking skills in order to be well prepared to be employable.”
- “This was a very beneficial conference as far as understanding my new expectations as an educator.”

- “Good organization and format for this inaugural session with good opportunities for networking. There is much work ahead of us!”
- “Exceptional agenda. It clearly worked for all of the stakeholders in the room.”
- “I came out with a MUCH clearer vision. The work sessions in districts were awesome. Great job. Thanks!”
- Our business panel representatives were excited for this endeavor and look forward to seeing continued results in the next few years.

Participation

We have had considerable participation from our districts and charters in implementing the requirements of Senate Bill 200. Fourteen out of seventeen school districts have reached out for funding to support expanding computer science education in Nevada. In addition, nine charter schools have received funding and are actively working to support their teachers with computer science education professional development.

Outreach

- [Expanding Computing Education Pathways Alliance Website](#) – funding and support
- [Byte-Size Seminar Series](#)
- [CSforNV Newsletter](#) for the state
- [STEMHub Computer Science](#)
- In-service teaching programs to obtain new computer science endorsements will be in place this Fall through Touro University and RPDP (UNLV and SUU credit bearing)

Approved Curriculum

- Computer Science Fundamentals (K-5 - Code.org)
- Computer Science Discoveries (6-8 - Code.org)
- AP Computer Science Principles (9-12 - Code.org)
- Project Lead the Way (various curriculum)

Teacher Licensing

On July 18, 2018, at the Commission on Professional Standards (COPS) hearing, the COPS board approved changes to the Computer Science teacher endorsement requirements. Those changes were necessary to remove barriers to computer science teacher recruitment from within our current educator workforce and to provide additional opportunities for endorsement outside of taking only college coursework through passing the recently updated Computer Science Praxis exam.

The new endorsements take a tiered approach building off of two main courses: Methods to Teach Computer Science and Computer Science Concepts. This tiered approach will assist teachers in obtaining the necessary training to be successful but remove barriers to receiving those endorsements.

- NAC 391.202: Endorsement to teach computer technology-based applications and computational thinking - requires 3-credit course on Methods for Teaching Computer Science, 3-credit course on Computer Science Concepts, and 3-credit course on Methods to Teach Computer Applications
- NAC 391.196: Endorsement to teach advanced computer science - requires 3-credit course on Methods for Teaching Computer Science, 3-credit course on Computer Science Concepts, 6-credits on instruction in computer programming languages OR pass the Praxis exam in Computer Science.

Professional Development

Professional development has taken place through our Regional Professional Development Program for K-12 educators throughout the state. The number of teachers trained to date includes:

- 1,663 - K-5 teachers trained in Computer Science Fundamentals
- 92 - 6-8 teachers trained in Computer Science Discoveries
- 79 - 9-12 teachers trained in Computer Science Principles

In addition, an online teacher training portal has been developed to assist teachers in their understanding and implementation of the new Nevada K-12 Computer Science Standards. This was a particular focus for educator training in our rural areas where access to in person trainings is limited.

In the Media

Computer Science education in Nevada has been mentioned in the media within this past year. Here are the links to that publicity:

- [Face The State Interview](#): September 29, 2017 by Arianna Bennett
- [Nevada Independent article](#): “Educators Aim to Make Computer Science as Mainstream as Math and English”, July 3, 2018, by Jackie Valley.

Supporting Information

Providing accurate information to our constituents has been a priority since the signing of Senate Bill 200. To that end, many resources have been created and processes put into place to facilitate this communication. Those resources are listed below:

- [STEMHub Computer Science](#) pages
- [Nevada Department of Education Computer Science](#) pages
- [Byte-Size Seminar Series](#) for Teachers, Administrators, and District Leaders
- [Frequently Asked Questions](#) Document
- [Draft Nevada Computer Science Education Strategic Plan](#)

Work in Progress

These items are currently in working status within the Computer Science subcommittee:

- Final Computer Science Education Strategic Plan
- Nevada Computer Science Landscape Report
- Guidance Documents related to the ½-credit graduation requirement Computer Education and Technology course (that includes 50% computer science and computational thinking) and K-6 computer education and technology requirements

And finally, educator professional development on the standards is a high priority for the Department of Education, future Computer Science Summits for training, and continued targeted resources for those districts and charters that were unable to participate in the funding stream this biennium.

We have only scratched the surface. While we have opened the door to awareness of this tremendous skills gap in our educational system this biennium, there is still much work to do to provide a solid foundation of computer science education in every corner, with every child in this great state of Nevada.