LEGISLATIVE EDUCATION STUDY COMMITTEE
BILL ANALYSIS
54th Legislature, 2nd Session, 2020

Bill Number	SB222	**Sponsor**	Candelaria/Stewart
Tracking Number	.216901.1	**Committee Referrals**	SEC/SFC
Short Title	Pre-Service Teacher Computer Science Program		
Analyst	Canada	**Original Date** **Last Updated**	2/6/2020

BILL SUMMARY

Synopsis of Bill

Senate Bill 222 (SB222) creates a grant program within the Higher Education Department (HED) to provide grants to state institutions of higher education to develop a pre-service teacher computer science education program. The bill requires grant recipients to identify opportunities for partnership opportunities between school districts and colleges of schools of education at the state institutions of higher education to create direct pathways for computer science teachers in high-need schools.

FISCAL IMPACT

The bill appropriates $1 million from the general fund to HED for expenditure in FY21. Any unexpended or unencumbered balance remaining at the end of FY21 shall revert to the general fund.

SUBSTANTIVE ISSUES

Computer science teaches students design, logical reasoning, and problem solving, all valuable skills for a 21st century career. The field of computer science goes beyond computer literacy; computer science builds students' capabilities to create and adapt to new technologies, such as creating algorithms, building apps, and learning how the Internet works. Students benefit from understanding why and how technology impacts their world. Knowledge of programming, big data, and robotics equips students with tools to participate in decision-making around growing and evolving technology fields. Computing jobs are the number one source of new wages in the U.S. and nine out of 10 parents want their children learning computer science. The College Board found that students who learn computer science in high school are six times more likely to pursue a computer science degree; young women specifically are 10 times more likely to pursue a computer science degree.

Despite significant investment in science, technology, engineering, arts, and mathematics (STEAM) programs, statewide science proficiency rates have decreased 5 percentage points in the

last three years. Investment in effective, differentiated STEAM programs is needed to improve student outcomes. In 2017, the Public Education Department (PED) adopted the NM STEM Ready! Science Standards (NMSRSS), which combine the national Next Generation Science Standards and six New Mexico-specific standards, to improve the rigor of STEAM instruction. State funding for STEAM initiatives has increased considerably in the past several years. The House Appropriations and Finance Committee substitute for House Bills 2 and 3 (HB2/HAFCS) includes $5 million for STEAM initiatives. Despite these investments and new initiatives, only 35 percent of New Mexico students were proficient in science in FY19. Because the demand for computer science careers has grown in recent years, New Mexico needs high-quality computer science teachers in the classroom and an increased focus on access to computer science education. SB222 supports developing computer science teachers in order to build workforce capacity and expand computer science education programs.
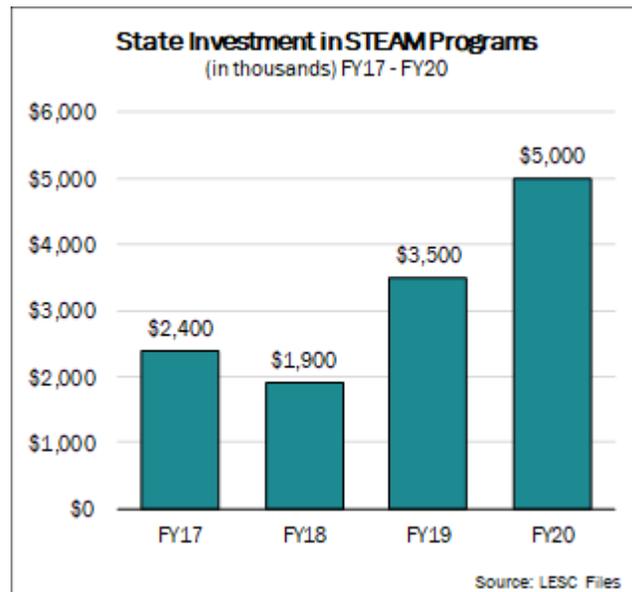
It is unclear if the appropriation will be used at state institutions of higher education for faculty shortages, program development, professional development, or scholarships. HED noted in their analysis that no institution of higher education submitted a funding recommendation for computer science education to HED through their formal funding process with the Legislature.

Preparing Students for 21st Century Careers. The Bureau of Labor Statistics projects a robust demand for workers in computer-science related fields through 2026. A national survey of computer science teachers, show that 88 percent of teachers say computer science will play a pivotal role in students' workplace success. Jobs in the computer science field are three times more in demand than other occupations in New Mexico. Additionally, the average salary for computing occupations is $71 thousand compared with the average state salary of $45 thousand.

Student Access to Computer Science Courses. In 2015, the passage of The Every Student Succeeds Act (ESSA) signaled to states that computer science, alongside other core subjects was necessary for a well-rounded education that leads to students being college and career ready. School districts are also now allowed to use federal funds to support computer science offerings. Nationally, only 45 percent of high schools teach computer science courses, compared with 23 percent of all public schools who offer computer science in New Mexico. Students in New Mexico are not required to take computer science courses or curricula. Starting in the 2017-2018 school

year, students were allowed to substitute a computer science unit for either a mathematics unit or science unit towards high school graduation requirements.

Workforce Capacity to Support Computer Science Courses. A primary challenge for attempting to introduce computer science into schools is the lack of teachers trained in the subject. New Mexico State University's Southwest Outreach Academic Research Evaluation and Policy Center reports math and science are the subjects with the first and second highest teacher vacancy rates, respectively. Nationally, high school principals state that the lack of a prepared teacher workforce is a barrier to teaching computer science. Research shows effective computer science teachers have thorough content knowledge and skills in computer science and understand the student learning progression. In order to help students meet learning outcomes in computer science, teachers must continuously refine their pedagogical content knowledge. This can be accomplished through sustained professional development.

In July 2019, PED adopted 6.29.17 NMAC, "New Mexico Computer Science Standards." The rule requires any public school, state supported school, or public education program conducted in a state institution in which computer science is taught, to adhere to computer science content standards published by the Computer Science Teachers Association (CSTA) and the Association for Computing Machinery (ACM). The standards were developed through a partnership between states, school districts, and a group of science, technology, engineering, and mathematics (STEM) non-profits, including the Association for Computing Machinery, Code.org, CSTA, the Cyber Innovation Center, and the National Math and Science Initiative. The standards are designed to introduce computer science concepts in each of the following five domains:

- Computing systems;
- Networks and the internet;
- Data and analysis;
- Algorithms and programming; and
- Impacts of computing.

As early as kindergarten, students in computer science-related lessons should be able to describe basic hardware and software problems or write programs with simple sequences and loops to express ideas. In third through fifth grade, the standards build on the foundational concepts and ask students to perform higher order critical thinking, like describing real-world cybersecurity issues and organizing and presenting data to highlight relationships and support a claim. In sixth through eighth grade, the standards evolve in complexity to incorporate more design elements, asking students to systematically identify and fix issues in computing devices, collect and transform data to make it more useful and reliable, and design programs collaboratively with a development team. Ninth and 10th grade students would be responsible for fully understanding complex computer science principals, and the standards include an optional level for 11th and 12th grade students designed to prepare students for a career in any of the five domains.

Additionally in 2019, CSTA was awarded a $3 million dollar grant from the U.S. Department of Education to work on a Computer Science for English learner's initiative, which aims to expand school and teacher capacity to offer computer science instruction to English learners in the southwestern United States, including New Mexico. SB222 provides funding for state institutions to develop pre-service computer science preparation programs in line with the already-established CSTA computer science standards.

Funding for Computer Science Professional Development in New Mexico. In FY20, PED received an appropriation of $200 thousand to develop and implement a teacher professional development program for computer science teachers. HB2/HAFCS includes an additional $200 thousand appropriation for FY21. SB222 provides a strategy to prepare computer science teachers before they go into the classroom. Research shows in order for computer science teachers to be prepared for their students, not only is pre-service preparation important, but professional development must be ongoing as well.

RELATED BILLS

Relates to HB62, Teacher Mentorship Program, which amends Section 22-10A-9 NMSA 1978, which outlines the requirements for the beginning teacher mentorship program to require the PED to annually distribute up to $2,000 per beginning teacher to school districts and charter schools for mentorship programs and creates a beginning teacher mentorship fund.

Relates to SB213, Teacher Professional Development, which appropriates $10 million for PED to spend on public school teacher professional development.

Relates to SB36, Creating the Teacher Preparation Task Force, which creates a task force to increase the accountability for and quality of teacher preparation programs in the state.

SOURCES OF INFORMATION
- LESC Files

CEC/tb/mc/sgs