



COLORADO
Department of Education

Legislative Report

Computer Science Teacher Education Grant Program 2022-23

Submitted to:
The Education Committees of the Colorado House of Representatives and Senate

By:
The Colorado Department of Education

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Introduction

Grant History

Administered by the Colorado Department of Education (CDE), the Computer Science Teacher Education Grant (CSEd) Program is a state-funded program designed to increase the number of teachers able to provide computer science education in Colorado. The intent of the grant program is to grow the capacity of schools to offer computer science courses and increase the number of students who interact with computer science content. This is accomplished through providing funding for professional development to introduce teachers to computational thinking, the use of computational thinking as a problem-solving process across all disciplines, both online and unplugged methods of teaching computer science, and the integration of computer science into general classroom curriculum. The CSEd is available to Colorado public schools including district charter schools, Institute charter schools, board of cooperative services schools (BOCES), and facility schools.

The Colorado General Assembly initiated the Computer Science Teacher Education Grant Program in 2017 upon the passage of Senate Bill 17-296, with an appropriation of \$500,000 for FY 2017-18. The legislature increased the appropriation by \$500,000 in 2018 through the passage of Senate Bill 18-1322 for a total of \$1,000,000 in FY 2018-19. Due to COVID-19 budget constraints, funding for this grant was reduced back to \$500,000 in FY 2020-21 and has remained at that level for the past 3 years. Complications related to COVID-19 also shifted how sections of the grant program operated, such as shifting the state sponsored training to a virtual format.

The legislation requires that CDE submit an annual report to the education committees of the Senate and House of Representatives of the Colorado General Assembly annually by January 1, detailing the following:

- The number of grants awarded during the previous calendar year;
- The amount of each grant awarded to each grant recipient;
- The number of teachers in each district who benefitted from the grant;¹ and
- The uses of each grant, including postsecondary courses, degrees, training programs, or industry recognized certificates completed and the education provider that provided the education.¹

Fiscal Year 2022- 2023 Summary

The legislature appropriated \$555,681 to this grant program for computer science teacher professional development during the 2022-2023 school year. Excluding administrative costs necessary to administer the grant, \$402,656 was available for distribution to LEPS.

In previous years, CDE administered the CSEd grant program as three separate professional development programs: (1) a K – 12 district-led program; (2) an elementary district-led program; and (3) a state-sponsored elementary regional program in which districts apply for individual teacher slots for the training. Due to the COVID-19 related allocation reduction, CDE administered only two of the three programs in the 2022-23 fiscal year: (1) a K – 12 district-led program; and (2) a state sponsored elementary regional program. However, due to

¹Because no-cost extensions were allowed in 2022-23 to extend the spending of funds through June 2024, the number of teachers trained and the uses of the grant are not final and are only available for some of the grantees.

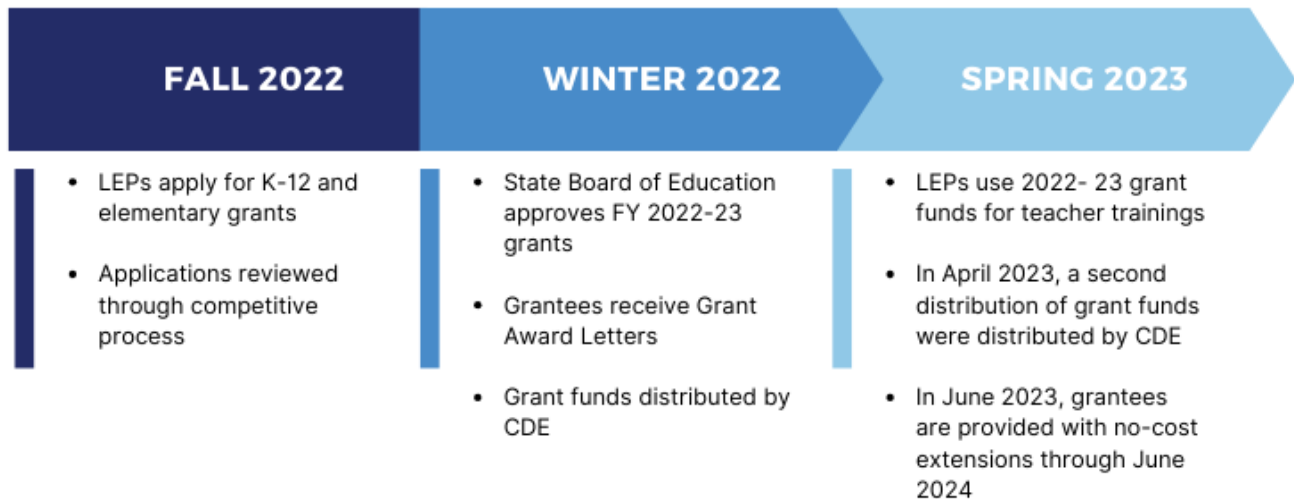
lack of registration by LEPs with our state sponsored elementary regional program provider, CDE did not ultimately distribute funding to districts for the regional training program.

Implementation of this grant program was complicated by the continuing impact of the COVID-19 pandemic during the 2022-23 fiscal year. The continued disruption to learning, staff shortages, and the reduced interest in professional development in addition to reduced availability of professional development providers halted or slowed much of the professional development school districts originally had planned for their teachers. Due to these challenges, the grantees of this program were provided with a no-cost extension, which allowed grantees to spend fiscal year 2022-23 funds through June 2024. A no-cost extension extended the project period beyond the original project end date, and as the phrase “no cost” suggests, there was no additional funding. Therefore, this report does not include the number of teachers to be trained or the allocation of the funds that have not yet been allocated by theLEPs, as end of grant reporting was not available by the time this report was written. Information will be included in next year’s report.

Timeline

For the 2022-23 fiscal year, the grant funds were first distributed in January 2023, with a second distribution in April 2023 because CDE didn’t get requests for the full grant amount in fall of 2022, so another round of distribution happened so that those funds could be expended. Originally, grantees were to expend funds through June 30, 2023. All 17 grantees were provided with a no-cost extension; they can expend funds through June 30, 2024. Diagram 1 below illustrates the CSEd grant funding cycles through the 2022-23 fiscal year. Appendix A shows more information about the CSEd grant funding cycles since the inception of the program.

DIAGRAM 1: Funding Levels and Distribution



Eligibility

Local education agencies that participated in the CSEd grant program were eligible to receive funds to provide teachers with professional development in computer science. The funds could be used for any of the following:



- Tuition, including fees;
- Professional development training program costs (including substitute/stipends); or
- Professional development books and/or materials used by the teacher during professional development.

The authorizing legislation and CSEd grant rules stipulate that CDE give priority to LEPs designated as rural and those with high populations of students of color and/or low-income students. CDE provided applying LEPs with assistance in completing the application to aid in meeting CDE’s goals for establishing or bolstering LEPs’ computer science programming.

Computer Science Grant Participation & Funding Allocations

Local Education Provider Participation

CDE received 17 applications for the teacher education programs from districts, Charter School Institute schools, and Boards of Cooperative Educational Services (BOCES) for the 2022-23 school year. Applicants requested a total of \$439,356. After committee reviews, CDE awarded 17 CSEd grants totaling \$394,645. Table 1 illustrates the total number of grants, total amounts applied for, and the total amounts awarded. Figure 1 shows the location of the awarded districts throughout Colorado. Appendix C demonstrates what each reporting LEP applied for, received, and how the funds were distributed.

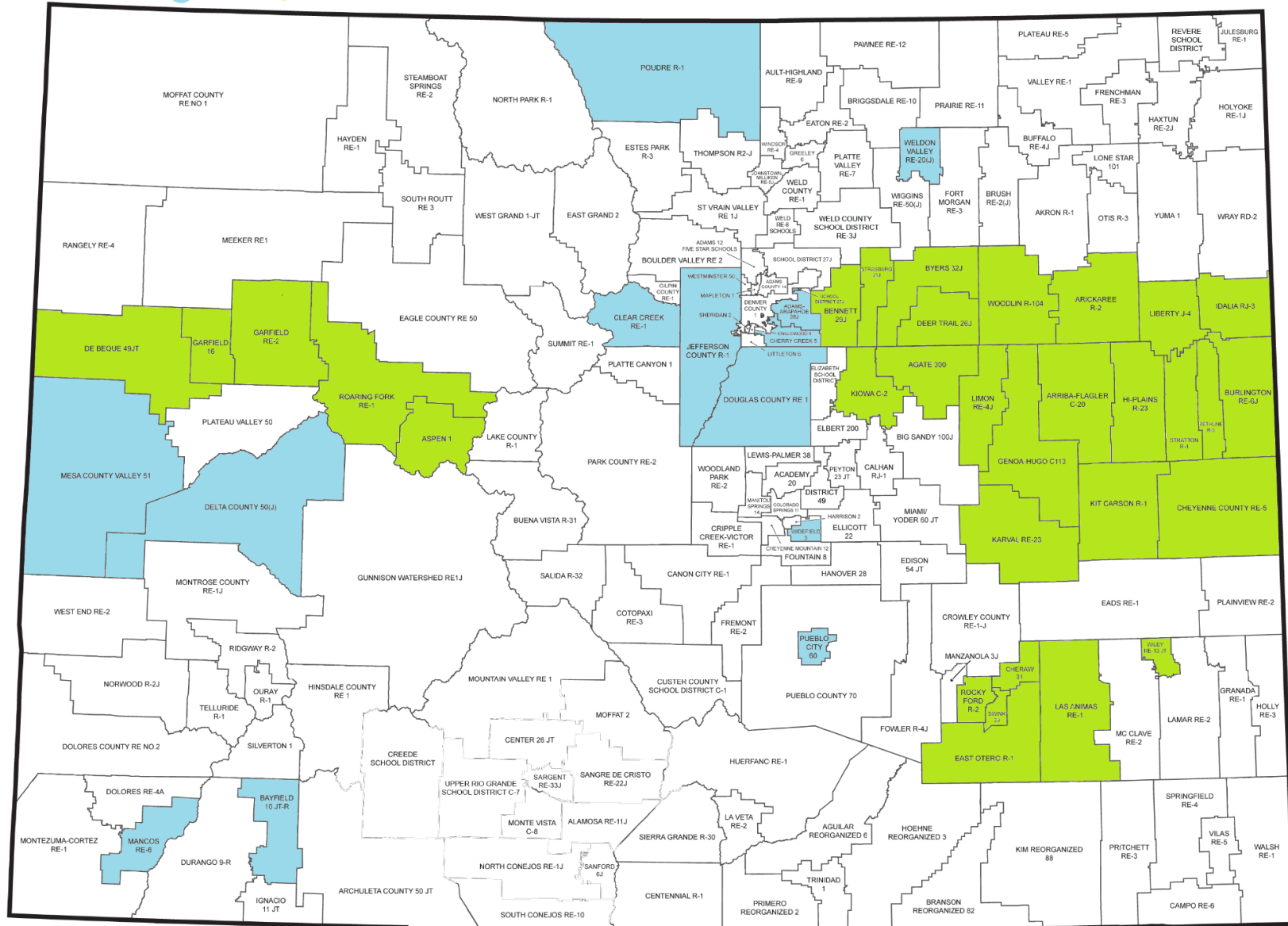
TABLE 1: 2022-23 Computer Science Education Grant Applications

Grant	# of LEPs Applied	Amount Applied For	# of LEPs Approved	Amount Awarded
K-12 District Determined	17	\$439,356	17	\$394,645

District ● BOCES ●

Colorado School District Map

Csed Teacher Education Grant



Produced by the Colorado Department of Education - July 2019

Figure 1. Map of the 2022-23 Computer Science Teacher Education grantees.

Note: Districts highlighted in blue received grant funding based upon submission of individual applications, while those in green were served through an awarded BOCES

Local Education Provider Priority Criteria

As noted previously, the CSEd grant program prioritizes LEPs designated as rural and those with high populations of students of color and/or low-income students. Six out of the seventeen 2022-23 grantees are designated as rural or small rural districts according to CDE definitions.² Three grantees are BOCES which also represent rural districts. The remaining 8 grantees are non-rural districts. In addition, six grantees have student populations that are greater than 42 percent (the state average in 2022) eligible for free or reduced-price lunches and six grantees have student populations that are greater than 46.6 percent (the state average in 2022) minority. Figure 2 below provides a summary of the priority areas the grant serves. For a detailed listing of all grantees and the priority area(s) each grantee met, view Appendix B.

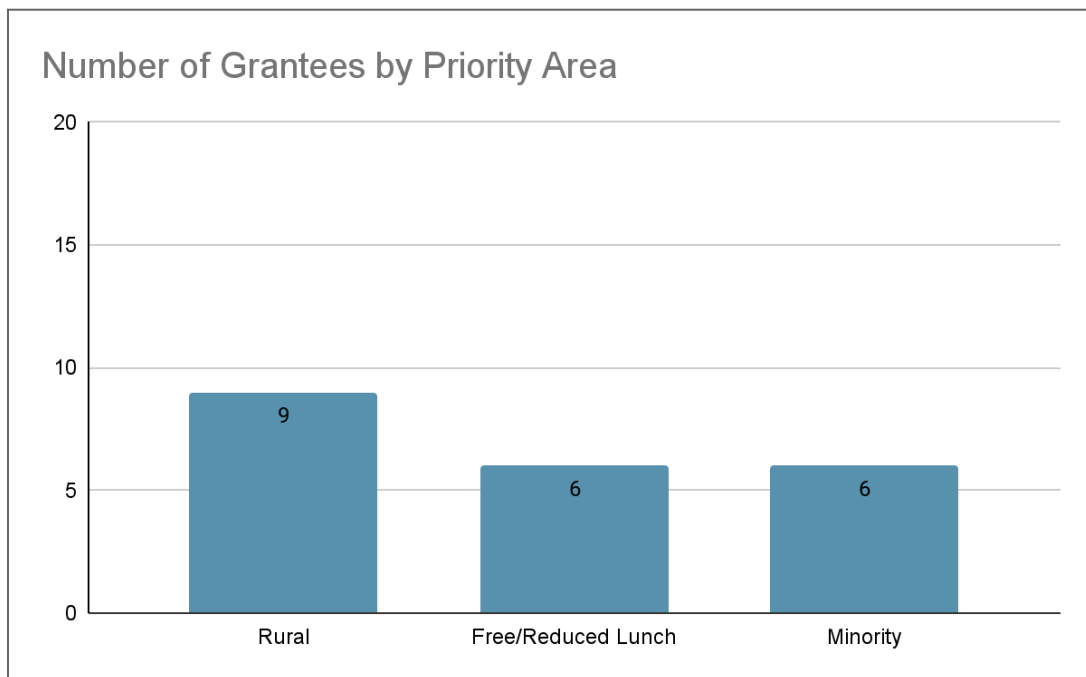


Figure 2. 2022-23 Computer Science Education Grant Awardees by Priority Area.

Total Grant Award and Designation of Funds

Based on the 7 LEPs reporting funding use data at the time this report was written, most funds allocated to grantees through the Teacher Education Grant program (44.2%) were used for professional development/training. The second largest allocation category was funds for stipends and substitute pay (25.8%). Figure 3 shows an overall summary of the currently reported allocation of funds. For a detailed listing of the LEPs that were awarded funds and the anticipated use of funds, see Appendix C. Note that this data only includes about a third of all grant funds allocated due to the fact that all LEPs were provided extensions.

² A Colorado school district is determined to be rural based on the size of the district, the distance from the nearest large urban/urbanized area and having a student enrollment of approximately 6,500 students or fewer. Small rural districts are those districts meeting these same criteria and having a student population of fewer than 1,000 students. - Rural Education Council | CDE (<https://www.cde.state.co.us/ruraledcouncil>)

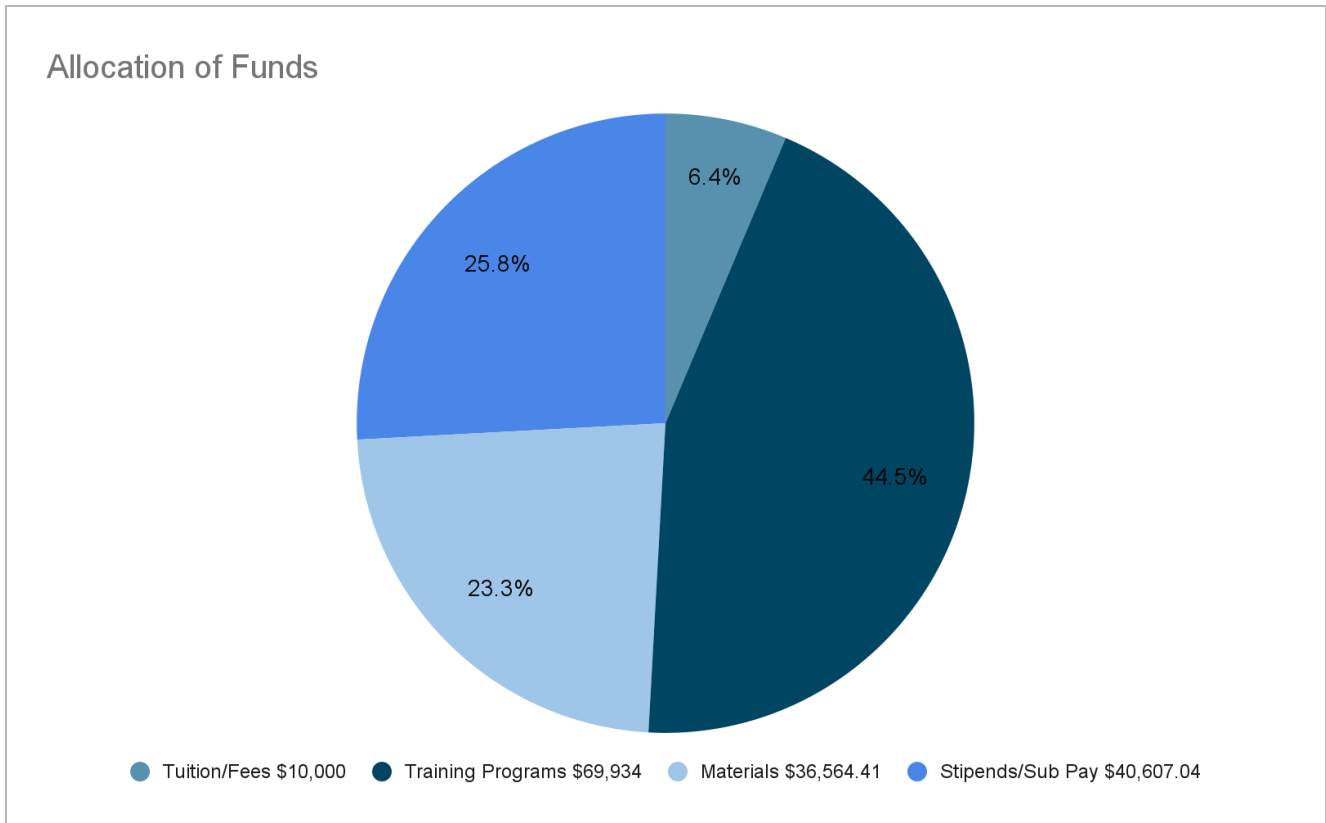


Figure 3.
2022-23 Computer Science Education Grant Allocation of Funds from 7 Currently Reporting LEAs.

Program Implementation Activities

Using the K-12 district-led program, grantees were able to select the professional development providers which best met the needs of their students and districts. Thus, a variety of professional development options were funded through the grant. Grantees can use grant funds to contract with a provider to train their teachers, or grantees can allocate money to specific teachers to participate in training by various providers. Additionally, grantees can utilize grant funds for university tuition, online courses, and district-directed professional development. The table in Appendix E provides a listing of training programs and courses reporting grantees provided to their teachers using grant funds.

Computer Science Course Data

The intent of the CSEd program is to increase students’ opportunities in computer science education in Colorado. The data submitted by grantees show an increase of 15 computer science courses offered by grantee districts. Though each district maintains the ability to determine the curriculum of their courses, per S.B. 17-296, grantees are required to use funding for a course that meets the CDE definition of computer science education. Based

upon this definition, a computer science education course includes the study of computers, algorithmic processes, and computer programming and coding, including their principles, their hardware and software designs, their applications, and their impact on society. Figure 4 illustrates the total number of courses offered pre- and post-grant within 7 grantee LEPs that are currently reporting courses offered. Note that reporting this data is optional for grantees who use funds to support computer science teacher education within elementary grade bands because elementary schools do not have specific computer science courses and rely on integration of computer science concepts into other subject areas.

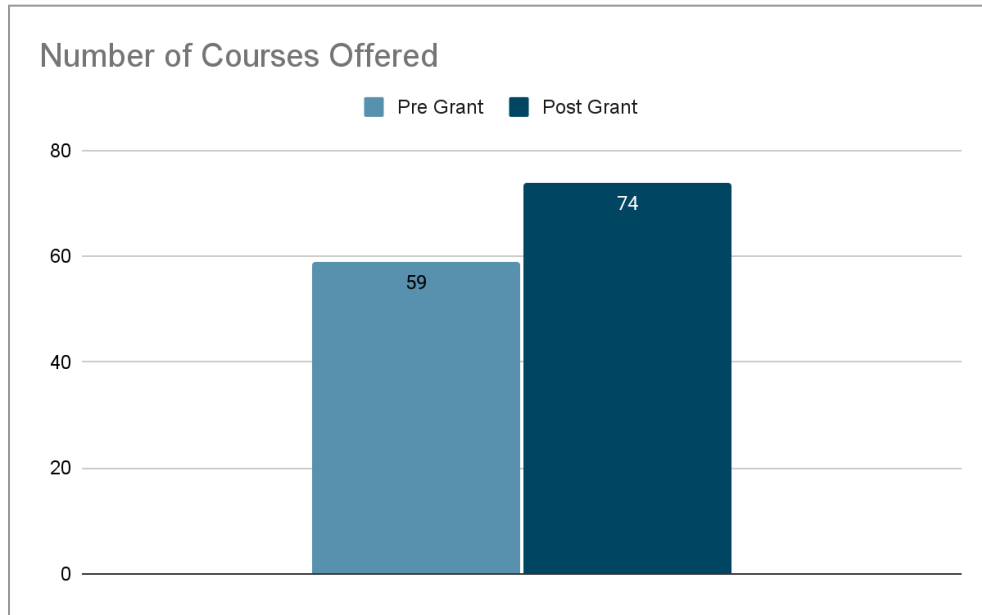


Figure 4.
Number of Computer Science Courses Offered in Grantee Districts Pre & Post Grant
from 7 Currently Reporting LEPs.

Impact on Teachers and Students

Based on information available at the time of writing, a total of 436 teachers were trained through the CSEd teacher education grant program using funds from the 2022-23 fiscal year grant. These numbers are expected to increase as not all LEPs have reported their data yet. Based upon data reported by 6 grantees³, the currently trained teachers will impact approximately 21,623 K-12 students within Colorado's public school system. Additionally, grantees have reported an increase in teachers working towards a CDE endorsement connected to computer science education. Based upon data submitted by LEPs, 51 such endorsements were attained during the 2022-23 fiscal year due to the grant program. Table 2 illustrates the aggregated total number of teachers trained at each grade band and reported total number of K-12 students directly impacted by training. For a detailed list of participant numbers by LEP and grade band, see Appendix D.

³ Note: One grantee reported courses and fund allocations but not the amount of teachers impacted.



TABLE 2: Aggregated Totals of Teachers and Students served from 6 Currently Reporting LEPs

Total # of Grantees Reporting	Total # of Teachers Trained	Total # of K-5 Teachers Trained	Total # of 6-8 Teachers Trained	Total # of 9-12 Teachers Trained	Total # of Endorsements Gained	Total # of Students Directly or Indirectly Impacted
6	436	308	76	52	51	21,623

Conclusion

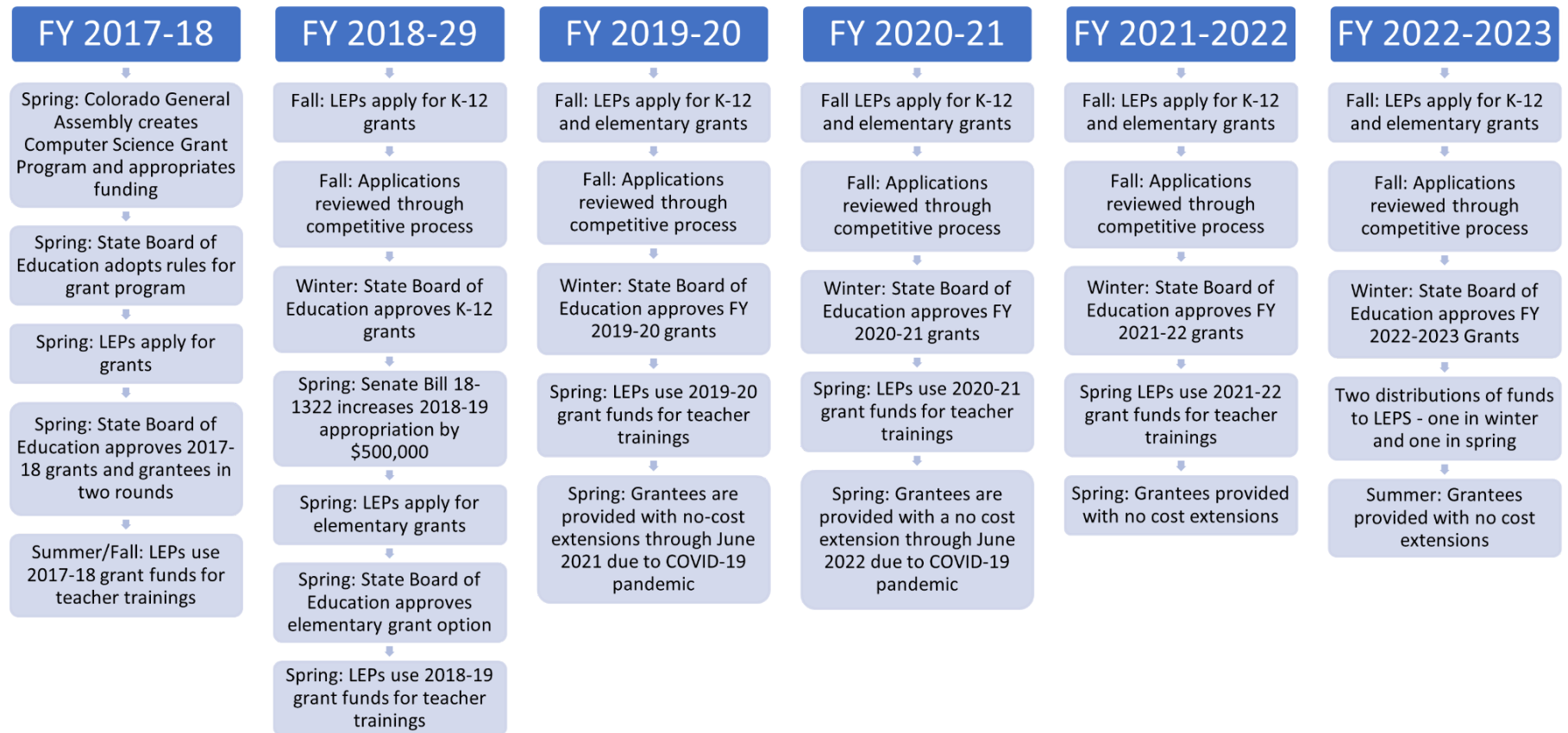
The Colorado Department of Education has continued to administer the CSEd grant with the goal of increasing the number of teachers available to provide computer science education in Colorado. In its sixth year, the CSEd grant program has worked towards this goal by providing access to high quality professional development through various providers. This professional development has introduced teachers to computational thinking, the use of computational thinking as a problem-solving process across all disciplines, both online and unplugged methods of teaching computer science, and the integration of computer science into the general classroom curriculum in K-12.

In self-reported data, grantees experienced an increase in computer science courses offered at their schools and have reported an increase in teachers working towards a CDE endorsement connected to computer science education; 51 such endorsements were attained during the 2022-23 fiscal year due to the grant program. While this data is affected by many factors, the increase in teachers trained in computer science education leads to additional staff qualified to teach these courses. Further, to sustain computer science programming, many grantees have started or continued to develop K-12 computer science pathways in their schools as part of their grant application.

Implementation of this grant program was complicated by the continued impact of the COVID-19 pandemic. The impact of COVID-19 is most clearly seen through teacher participation. Teacher participation may have decreased due to teacher shortages and/or burnout, the lack of available substitutes, or reduced availability of professional development providers which halted some of the professional development LEPs originally had planned.

Appendices

Appendix A: Historic Grant Timelines





Appendix B: 2022-23 Computer Science Education Grant Awardees by Priority Area

Local Education Provider	Rural	>42% Free or Reduced Lunch	>46.6% Minority
Adams-Arapahoe 28J	*	✓	✓
Bayfield 10 JT-R	✓	*	*
Cherry Creek	*	*	✓
Clear Creek- RE 1	✓	*	*
Colorado River BOCES	✓	✓	✓
Delta County 57 (J)	✓	✓	*
Douglas County	*	*	*
East Central BOCES	✓	*	*
Jefferson County	*	*	*
Mancos	✓	✓	*
Mesa County 51	✓	✓	*
Poudre Re-1	*	*	*
Pueblo City 60	*	✓	✓
STEAD Charter School (in School District 27J)	*	*	✓
Swink 33/Santa Fe Trail BOCES	✓	*	*
Weldon Valley	✓	*	*
Widefield	*	*	✓
Total	9	6	6



Appendix C: Total Grant Award and Use of Funds From LEPs Reporting at Time of Report

Local Education Provider	Grant Amount Applied for	Total Grant Award	Tuition Fees	PD/Training	Materials	Stipends and Substitute Pay
Adams-Arapahoe 28J	\$30,000	\$26,400	NCE	NCE	NCE	NCE
Bayfield 10 JT-R	\$30,000	\$26,400	NCE	NCE	NCE	NCE
Cherry Creek	\$30,000	\$26,400	NCE	NCE	NCE	NCE
Clear Creek- RE 1	\$27,039	\$23,795	NCE	NCE	NCE	NCE
Colorado River BOCES	\$25,000	\$22,000	-	\$15,000.00	-	\$7,000.00
Delta County 57 (J)	\$5,800	\$5,800	-	\$2,900.00	-	-
Douglas County	\$21,066	\$18,538	-	\$9,921.20	\$3,051.70	\$3,316.95
East Central BOCES	\$30,000	\$26,400	-	\$18,000.00	\$7,650.00	\$750.00
Jefferson County	\$30,000	\$26,400	-	\$5,150.00	\$7,740.00	\$13,510.00
Mancos ⁴	\$30,000	\$26,400	\$10,000	\$10,000.00	\$6,400.00	\$8,698.00
Mesa County 51	\$29,644	\$26,087	NCE	NCE	NCE	NCE
Poudre Re-1	\$29,999	\$26,400	NCE	NCE	NCE	NCE
Pueblo City 60	\$30,000	\$26,400	NCE	NCE	NCE	NCE
School District 27J	\$6,348	\$6,348	NCE	NCE	NCE	NCE

⁴ CDE has reached out to this LEP for additional information about why their totals exceed the budgeted amount.



Local Education Provider	Grant Amount Applied for	Total Grant Award	Tuition Fees	PD/Training	Materials	Stipends and Substitute Pay
Swink 33/Santa Fe trail BOCES	\$30,000	\$30,000	-	\$8,963.28	\$11,722.71	\$7,332.09
Weldon Valley	\$24,600	\$24,600	NCE	NCE	NCE	NCE
Widefield	\$29,860	\$26,277	NCE	NCE	NCE	NCE
Total	\$439,356	\$394,645	\$10,000	\$69,934.49	\$36,564.41	\$40,607.04

Note: Amounts spent on Tuition fees, PD/training and Stipends and Substitute pay are not final due to grant funds yet to be expended, or subject to change, due to the no cost extensions (NCE).



Appendix D: 2022-23 Computer Science Education Grant Participants by Grantee

Local Education Provider	Total # of Teachers Trained	Total # of K-5 Teachers Trained	Total # of 6-8 Teachers Trained	Total # of 9-12 Teachers Trained	Total # of Endorsements Gained	Total # of Students Directly or Indirectly Impacted
Colorado River BOCES	49	14	12	23	49	931
Douglas County	53	36	16	1	0	7,350
East Central BOCES	80	40	20	20	2	330
Jefferson County	244	211	26	7	0	12,690
Mancos	5	5	0	0	0	258
Swink 33/Santa Fe Trail BOCES	5	2	2	1	0	64
Total	436	308	76	52	51	21,623

Note: the numbers of teachers trained and students impacted are not final due to grant funds yet to be expended, or subject to change, due to the no cost extensions (NCE). This table only includes grantees that reported the numbers of teachers trained and students impacted in 2022-23.



Appendix E: 2022-23 Computer Science Education Workshops and Courses Implemented

Table reflects courses and workshops currently reported by LEPs. This list will increase as more LEPs report in September 2024.

Course/Workshop Title
<ul style="list-style-type: none">● Python Fundamentals,● Game Design and Development,● 3D Game Programming● Cyber Crew Security Courses● Code.org Professional Development● CodeHS● AP Computer Science Principles in JavaScript● Python and AP Computer Science Principles (Java)● MindSpark Learning (Robotics, Sphero, 3D Printing)● TechSmart● Cyber.org Professional Development