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Summer of CS Follow-Up Survey Findings

Educator Workforce Investment Grant in Computer Science External Evaluation

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Contents

Exhibits

Executive Summary

The Educator Workforce Investment Grant in Computer Science (EWIG: CS) supported a series of learning opportunities in the summers of 2023, 2024, and 2025, known collectively as "Summer of CS." Through multiday workshops offered across the state, Summer of CS sought to build the capacity of K–12 educators in California to deliver high-quality instruction in computer science. As the external evaluator of EWIG: CS, the American Institutes for Research® (AIR®) has released reports that use registration records, preworkshop and postworkshop participant surveys, and focus groups to identify key findings about participant experiences with Summer of CS. This report builds on those findings by sharing results from a follow-up survey administered in fall 2025 to participants from Summer of CS workshops in 2023 and 2024. The following key findings suggest that workshop participants had positive experiences with Summer of CS, including increases in self-reported confidence and beliefs about teaching computer science, and delivered computer science instruction to their students in the year(s) following their workshop.

Key Finding #1: Survey respondents reported positive impressions of the knowledge and skills they had developed through their Summer of CS experience. Positive features of the workshops identified through the survey included opportunities for collaborating with other teachers, engaging in hands-on learning, and working with high-quality instructors.

Key Finding #2: Survey responses revealed a positive and statistically significant change in participants' confidence in teaching computer science between the beginning of Summer of CS workshops and their return to the classroom 1–2 years later. This growth in confidence persisted despite a small drop between the end of the workshop experience and the time of the follow-up survey.

Key Finding #3: Survey responses revealed a positive and statistically significant change in beliefs about who can and should do well in computer science between the beginning of Summer of CS workshops and participants' return to the classroom 1–2 years later. These changes were smaller in magnitude than those for educator confidence, but the preworkshop values were also higher, suggesting that educators who chose to participate in Summer of CS workshops already had strong beliefs about the importance of computer science and the ability of all students to succeed. This growth in beliefs persisted despite a small drop between the end of the workshop experience and the time of the follow-up survey.

Key Finding #4: Workshop participants delivered computer science instruction when they returned to their classrooms. Eighty-six percent of Summer of CS participants had taught computer science during the 2024–25 school year, and nearly two-thirds reported that they had taught computer science at least weekly. The average number of hours of instructional time for these participants ranged from 87 at the elementary level to 241 at the high school level.

Key Finding #5: The primary format of computer science instruction was the integration of content into another subject area; this was especially true in the elementary grades. Nearly two-thirds of survey responses reported teaching in this way, including 72% of respondents teaching students in Grades Prekindergarten–5. Roughly one-third of respondents reported teaching a standalone computer science class during the school day.

Key Finding #6: Important needs remain for resources and support to enable computer science instruction to capitalize on positive changes in educator capacity. Survey respondents reported gaps in the availability of valuable tools like time, funding, and ongoing professional learning.

Together, these findings add to encouraging evidence about the quality of the Summer of CS experience and its potential for improving the state of computer science education in California. We emphasize that this evidence is correlational; our study design does not enable us to make statements of causality with our conclusions. Moreover, self-reported data about participant confidence, beliefs, and behaviors may or may not translate into actual changes in student experiences. We recommend further exploration into student experiences to better understand the ways in which capacity-building efforts like Summer of CS can promote access to, participation in, and success with computer science education.

Introduction

Through the Educator Workforce Investment Grant in Computer Science (EWIG: CS), the state of California has funded a statewide effort designed to increase educator capacity to deliver computer science education with an equity focus. [1] This report shares findings regarding a key component of the EWIG investment: "Summer of CS." [2] Summer of CS was a professional development series aimed at California educators interested in delivering computer science learning opportunities to students in the state's public schools. Educators participated in multiday workshops held through regional offerings across the state, as well as an in-person event held in Anaheim known as "CSPDWeek." This report builds on previous findings about participant experiences at Summer of CS workshops[3] to present evidence about educator perspectives and behaviors 1 to 2 years after their participation in summer workshops.

The American Institutes for Research (AIR) has partnered with the EWIG: CS lead agencies to serve as the external evaluator for the grant. To inform its evaluation approach, the AIR team organized a set of research questions on the four components of the CAPE framework, which highlights *capacity* to deliver, *access* to, *participation* in, and *experiences* with computer science education. [4] Each component of the CAPE framework directly addresses equity and acknowledges the multiple layers of an educational approach that equips students to thrive in computer science (Fletcher & Warner, 2021). Guided by this framework, the AIR evaluation seeks to answer the research questions identified in Exhibit 1.

This report addresses Research Questions 2 and 7 by further examining participant experiences in the 2023 and 2024 Summer of CS workshops, then exploring participant behaviors in the year(s) following the workshop. It shares the results of surveys administered to workshop participants at the beginning of their workshop, the end of their workshop, and the beginning of the 2025–26 school year. Together, these data add to a growing body of evidence on EWIG: CS efforts to improve computer science educator capacity.

[1] EWIG: CS is one of multiple investments the state of California has developed to foster professional learning opportunities for educators. For more information about this program, see https://www.cde.ca.gov/ci/pl/ewig.asp.
[2] For more details about Summer of CS and the broader professional learning series to which it belongs, Seasons of CS, see https://www.seasonsofcs.org/.
[3] For findings about Summer of CS and other reports from AIR's EWIG: CS evaluation, please visit https://www.air.org/project/evaluation-educator-workforce-investment-grant-computer-science.
[4] See https://ecepalliance.org/resources/models/cape/.

Exhibit 1. EWIG: CS Evaluation Research Questions

Research question	CAPE dimension
1. To what extent have EWIG professional learning activities reached and included their target audiences? – To what extent does the pool of participants reflect the California K–12 teaching force? – To what extent is participation in Seasons of CS orientation workshops associated with subsequent participation in other EWIG professional learning activities?	Capacity
2. How do EWIG workshop participants describe the quality of their professional learning experiences? – What changes in knowledge and skills to teach computer science (CS) do EWIG workshop participants report after their professional learning experiences? – What changes in beliefs and confidence to teach CS do EWIG workshop participants report after their professional learning experiences?	Capacity
3. To what extent do CS Champions believe that the training and support they receive has adequately prepared them to carry out their work? What insights do CS Champions have about their role in equitably expanding CS education?	Capacity
4. What is the nature and frequency of interactions among CS Champions outside formal professional learning activities?	Capacity
5. To what extent have the numbers of discrete CS courses increased during the time period of the 2021 and 2023 EWIG grants?	Access
6. To what extent has participation in discrete CS courses increased during the time period of the 2021 and 2023 EWIG grants? To what extent has participation increased for historically underrepresented populations?	Participation
7. To what extent have teachers' instructional practices changed after participating in EWIG professional learning activities?	Experience

Methods

The AIR research team administered a survey to educators who attended Summer of CS in 2023 and/or 2024 to collect data about behaviors and perspectives during the 2024–25 school year. This section explains the methods AIR used to collect data and produce this report.

Survey Design

The AIR research team developed the follow-up survey in consultation with members of the EWIG: CS planning team from the Sacramento County Office of Education (SCOE); San Bernardino County Superintendent of Schools; the University of California, Los Angeles; and the Californians Dedicated to Education Foundation. A subset of questions about confidence and beliefs with respect to computer science had previously appeared in both Summer of CS 2024 preworkshop and postworkshop surveys to measure how respondents' answers changed over time; the follow-up survey enabled an analysis of further changes a year or more after the workshop concluded. Additional survey items focused on the overall workshop experience, the degree to which workshop participants delivered computer science instruction, and the resources and supports necessary for their success. See Appendix A for a full list of survey items in the follow-up survey instrument.

Survey Data Collection

AIR programmed the follow-up survey using the survey platform Fillout. AIR then sent individualized survey links via email to Summer of CS 2023 and 2024 participants, using registration and contact information provided by SCOE. The survey was open for 3 weeks in September 2025, and nonrespondents received email reminders to complete the survey from both AIR and SCOE. Public school educators who completed the survey received a $50 gift card incentive.

Survey Responses

SCOE provided AIR a list of 1,205 educators who had participated in Summer of CS in 2023 and/or 2024. Email addresses for 85 of these educators were no longer active, leaving us with a sample of 1,120 educators. Of those, 681 completed our follow-up survey, for a response rate of 61%. Among the 681 survey completers, 28% attended a Summer of CS workshop only in 2023, 48% attended only in 2024, and the remaining 24% attended in multiple years. See Appendix B for a more detailed analysis of survey response rates.

Survey Analysis

Most of the analyses on the follow-up survey are descriptive. Our primary goal was to summarize patterns in educators' responses rather than make predictions or establish causal relationships. In this report, we share descriptive statistics, such as means and percentages, to provide an overview of responses to the follow-up survey.

In the 2024 and 2025 Summer of CS reports, AIR analyzed survey responses on 19 survey items individually to assess change over time. For this report, we converted most of these survey items into two scales: a scale measuring educators' confidence in teaching computer science, and a scale measuring educators' beliefs about who can and should learn computer science. See Appendix C for more details on the development of these survey scales.

AIR conducted a repeated measures ANOVA, a statistical method used to compare responses from the same group of people across multiple points in time. Instead of looking at each time point separately, ANOVA tests whether the average responses differ significantly across all time points, while accounting for the fact that the same individuals provided data more than once (Lund Research, 2018). This approach enabled us to determine whether educators' confidence and beliefs changed meaningfully across three points in time: before they took their 2024 Summer of CS workshop, directly after they took their 2024 Summer of CS workshop, and in our follow-up survey. See Appendix D for more details on this analytic approach.

Finally, the research team conducted analyses to explore the relationship between respondent characteristics and changes in confidence and beliefs. These analyses paid particular attention to aspects of participants' identities and professional history with computer science to explore the degree to which Summer of CS experiences might differ for respondents who have been historically underrepresented in the field. Using the confidence and belief scales as outcome variables, analysts conducted multiple linear regression that included as independent variables participant experience with teaching computer science, gender, racial identity, the number of Summer of CS workshops attended between 2023 and 2025, academic year workshops attended, and grade level(s) taught before workshop participation. The team selected this model because the dependent variable was continuous, and we wished to explore the relationship of multiple predictor variables simultaneously with the change in responses between workshops. This analysis enabled us to examine whether particular subgroups experienced changes significantly different from their counterparts after controlling for other characteristics. We assessed statistical significance at the $p < 0.05$ level. The text of this report highlights findings in which our regression models found the coefficients for any of these independent variables to be statistically significant. See Appendix E for the full regression output.

The research team conducted all survey analyses using the statistical software platform Stata.

Limitations

Any research approach features limitations that should shape the reader's interpretation of study findings. Here we highlight important implications of the methods employed for the EWIG: CS evaluation.

Self-Reported Data

First, the findings presented in this report rely heavily on self-reported data. The Summer of CS follow-up survey asked individuals who had been part of the EWIG: CS grant to share their perceptions and memories of their experiences. The resulting data are therefore subject to factors such as recall bias and social desirability bias that might shape their responses to survey questions.

Statements of Causal Inference

Second, the study design does not permit causal inferences on the impact of the EWIG: CS program. No comparison group exists that would enable us to analyze differences in outcomes reported by program participants to individuals who had not received the same opportunities as those provided by the grant. Although the use of preworkshop, postworkshop, and follow-up surveys enabled a comparison of perspectives in the same individual across time, we cannot claim that EWIG: CS *caused* the results reported here. Relatedly, if an educator had changed email addresses, names, and/or schools without notifying the organizers of Summer of CS, it is possible that educators may have been left out of the repeated measures ANOVA and regression analyses because we could not identify them as the same person who took our survey across three time points.

Limitations of Survey Data

Online surveys like those used to collect data from workshop participants provide several benefits. However, because the surveys used standardized language for all respondents, some respondents may have interpreted questions differently, and bounded response options may not fully capture the nuances of all interactions.

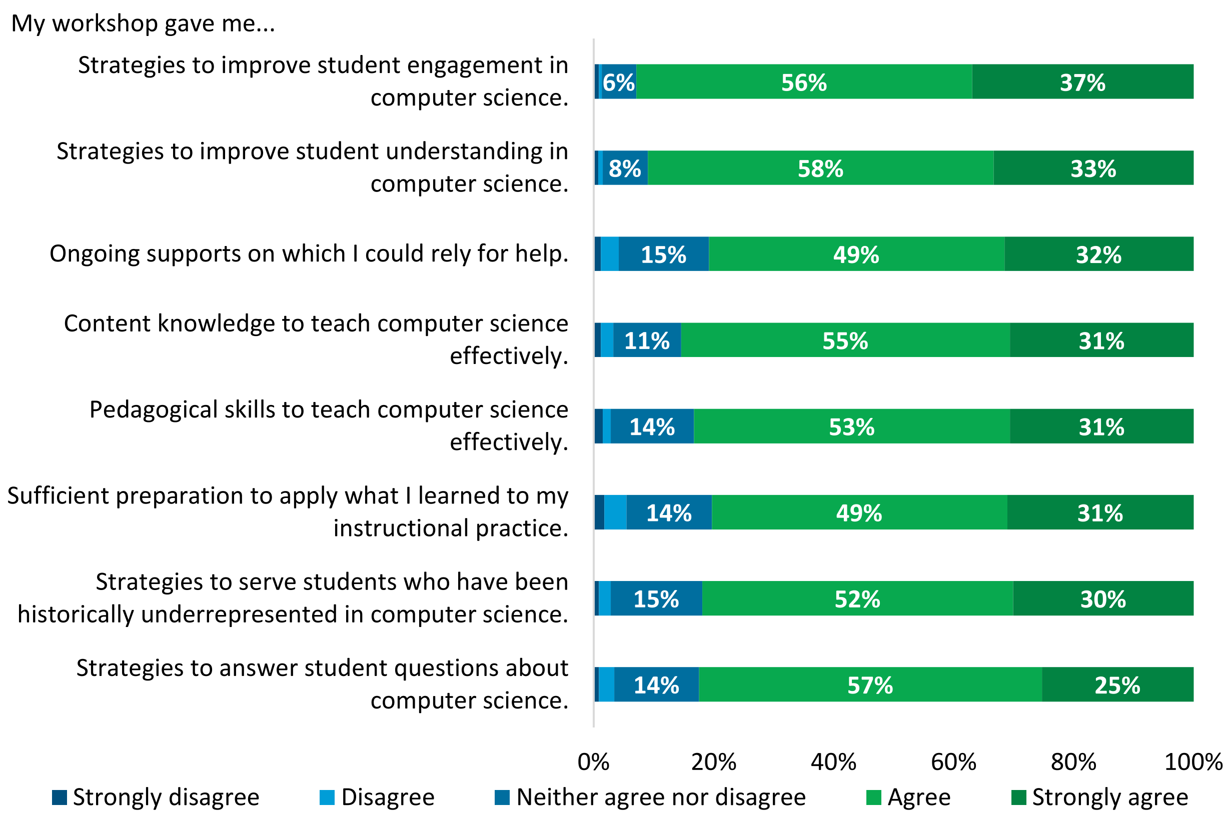
Findings About Workshop Experiences

One critical indicator of success for a professional learning opportunity is its perceived level of quality. Previous AIR reports about Summer of CS participant experiences shared high levels of agreement with statements about the quality and usefulness of their workshop. Exhibit 2 shows results from the follow-up survey administered in fall 2025, which built on these findings and found that a strong majority of respondents agreed or strongly agreed with statements that addressed the knowledge, skills, and resources that they had accessed through Summer of CS. For example, 37% of respondents strongly agreed and 56% agreed that their workshop had given them strategies to improve student engagement in computer science. Similarly, 31% of respondents strongly agreed and 55% agreed that the workshop had given them content knowledge to teach computer science effectively.

Key Finding #1

Survey respondents reported positive impressions of the knowledge and skills they had developed through their Summer of CS experience.

Exhibit 2. Perceptions of Workshop Quality



Note. *n*'s ranged from 670 to 676. Response categories with 5% or less do not have a data label. Categories may not total 100% due to rounding.

Write-in survey responses provided additional context about characteristics of the workshops that participants found valuable. When asked to identify the most helpful aspects of their workshop experience, respondents most frequently mentioned the opportunities to collaborate with peers, engage in hands-on learning experiences, and learn from high-quality instructors.

Collaboration and Networking With Other Teachers

The most common highlight of Summer of CS mentioned in the open-ended survey responses was the opportunity to connect with other educators through the workshop experience. As one participant explained, “Working alongside peers fostered a sense of community, encouraging knowledge sharing and teamwork, which enhanced both my technical and interpersonal skills.” Another respondent added, “Another highlight was collaborating with other educators. Hearing how others planned to apply these lessons gave me fresh perspectives and a sense of community, which is especially valuable since resources in my school are limited.”

Hands-On Learning Experiences

A comparable number of write-in responses referred to the pedagogical approaches to the workshop, with particular attention paid to the opportunities to engage in hands-on learning opportunities. “Getting to work on real coding projects,” one educator explained,” really helped solidify my understanding of programming concepts and gave me practical experience beyond just theory.” According to another respondent, “The most helpful aspect of Summer of CS was getting hands-on experience with computer science with help from the facilitator. This gives me experience and confidence to get started with my class.” Some participants further noted that the opportunity to experience the workshops through the lens of a student helped them appreciate and prepare for what their own students would need to navigate during the school year. One person described this strength as “being able to be taught some of the concepts as if I were a student, which I could then translate into me helping my own students.”

High-Quality Instructors

Participants also frequently drew attention to the quality of workshop facilitators who could provide expert guidance and support. One survey response described the instructor’s contributions in this way: “She modeled effective teaching strategies while providing excellent curriculum. Her support classes during the year enabled me to feel supported and teach the … curriculum to my students. I could not have done it without the support and encouragement that [the instructor] and the [workshop name] provided.” Another participant shared a similar sentiment: “Facilitator was knowledgeable and responsive. He provided clear explanations, scaffolds, and real-time feedback as I worked through coding tasks or lesson planning. It made the experience feel supportive and effective.”

Participation in Academic Year Workshops

Beyond the multiday summer workshops, participants had multiple opportunities throughout the subsequent school year to engage with their facilitator and colleagues in a series of structured learning opportunities known as "academic year workshops." More than four in five respondents (82%) reported having attended at least one of these academic year workshops, and roughly half (51%) reported attending three or more. Among respondents who indicated that they had attended at least one academic year workshop, the average number of events attended was 4.3.

Although comments about the academic year workshops were not among the most common write-in survey responses, some respondents offered perspectives about the value of those experiences. One participant shared, "The format of having the bulk of the content taught in the summer, but with refreshers throughout the school year when I could implement with students, allowed me to process the content and then troubleshoot implementation issues." Another person added, "Working with the same cohort and instructors the entire school year was very helpful."

Findings About Changes in Participant Perspectives

Workshop participant perceptions of quality provide useful evidence about the value of a professional learning experience, but these alone are insufficient for understanding the effectiveness of an effort like Seasons of CS. Teacher knowledge, understanding, and skills are critical to meet students' computer science learning needs effectively. Previous reports from the EWIG: CS evaluation have documented increases in participant confidence and beliefs from the beginning to the end of their workshop experience (Knudson, Castro, & Roy, 2025; Lee, Knudson, & Roy, 2024). The follow-up survey administered in fall 2025 enabled us to track changes in these areas a year after participants' summer 2024 workshop experiences.

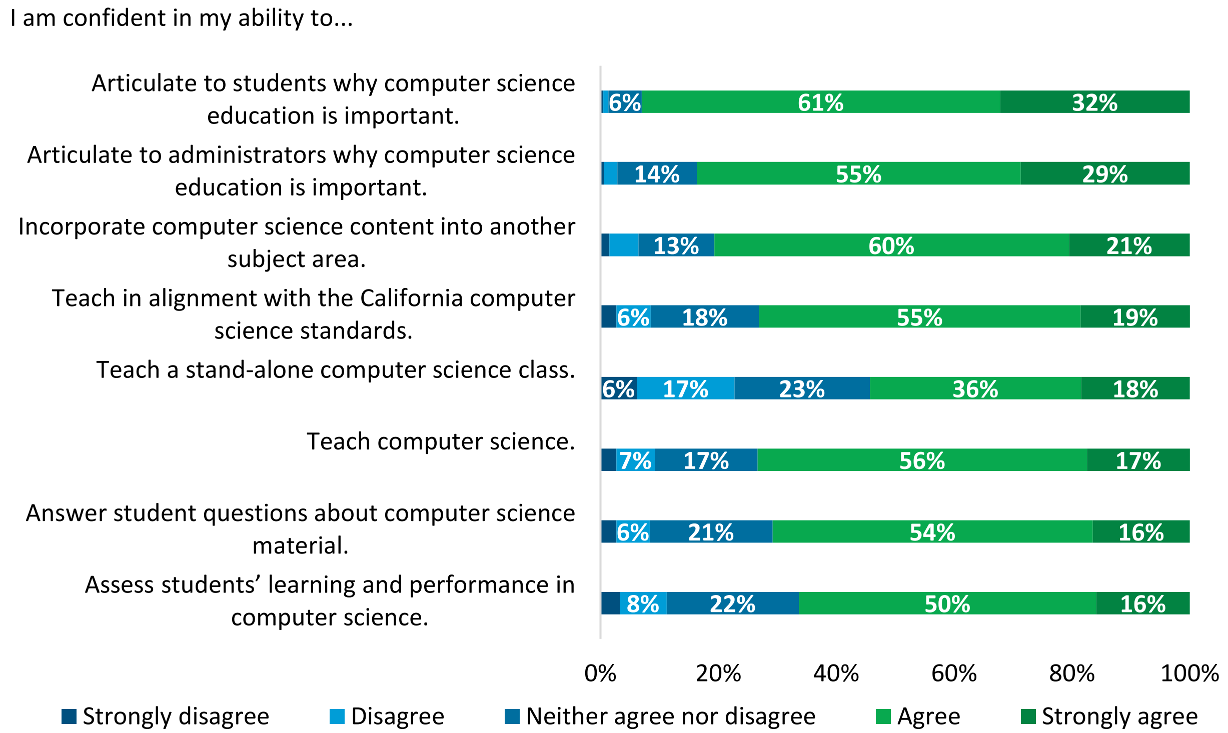
Changes in Participant Confidence

Key Finding #2

Survey responses revealed a positive and statistically significant change in participants' confidence in teaching computer science between the beginning of Summer of CS workshops and their return to the classroom 1–2 years later.

A set of eight survey items addressed participant confidence in teaching computer science. Exhibit 3 displays these items along with participant responses to them from the fall 2025 survey administration. For example, 16% of respondents strongly agreed and 54% agreed with the statement, "I am confident in my ability to answer student questions about computer science material." See Appendix F for a comparison of these responses across different survey administrations.

Exhibit 3. Follow-Up Survey Responses to Items in the Confidence Scale

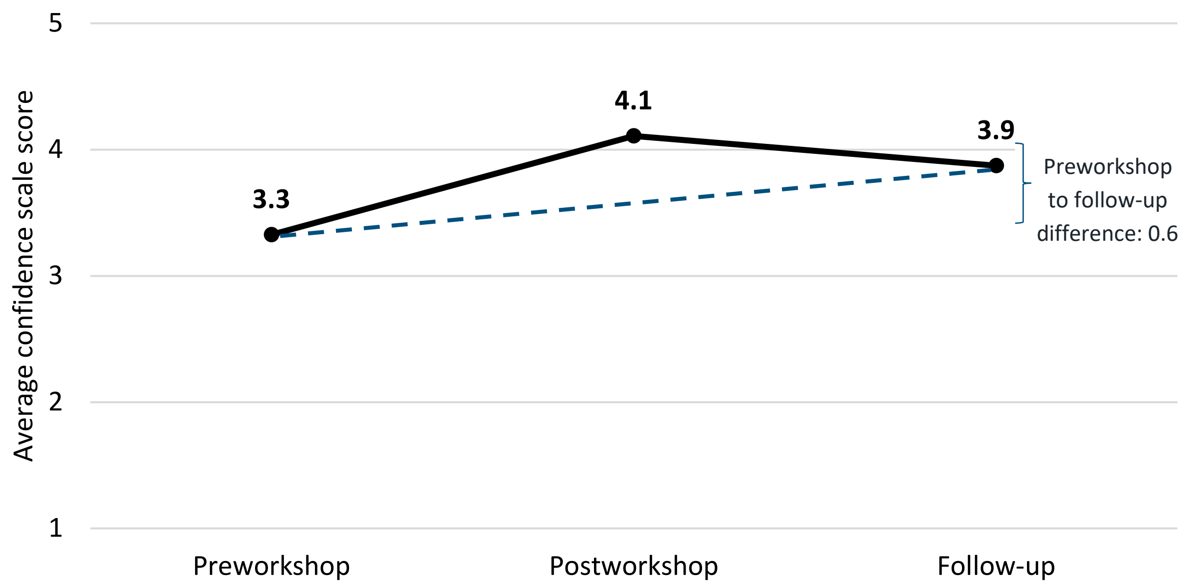


Note. *n*'s range from 663 to 671. Response categories with 5% or less do not have a data label. Categories may not total 100% due to rounding.

To describe participant confidence in a way that better captures the construct underlying individual survey responses and to facilitate clarity in interpretation, the AIR study team combined these items to create a single measure of participant confidence. (See Appendix C for a detailed description of this survey scale.) Using data from the subset of Summer of CS 2024 participants who responded to surveys at the beginning of their 2024 workshop, the end of their 2024 workshop, and in fall 2025, we then tracked changes in confidence over time.

Collectively, survey responses reveal an increase in average participant confidence following the Summer of CS workshop experience. Consistent with findings from Summer of CS in 2024 and 2025, we see a positive and statistically significant increase in self-reported confidence between the beginning and end of the workshop experience. With a difference of 0.8, the average magnitude of this change is nearly a full point on the 5-point Likert scale. However, between the end of the workshop and the administration of the follow-up survey a little more than a year later, respondents reported a drop in average self-reported confidence of 0.2 points. It may be that the experience of returning to the classroom introduced challenges that educators did not anticipate or fully appreciate during their workshop experience. The most important takeaway from these findings is nevertheless positive. From the beginning of the workshop experience, participants reported an increase in their confidence to teach computer science even after spending a full year back in the classroom. (See Exhibit 4.)

Exhibit 4. Changes in Average Confidence Scale Score



Note. *n* = 307. Survey scale scores have been rescaled to the original Likert range of 1–5 for ease of interpretation.

Changes in Participant Confidence: Subgroup Results

Just as efforts to support the equitable expansion of computer science seek to improve participation among students who have historically been underrepresented, they also seek to improve representation within the computer science teaching force. Most members of the computer science field are men who identify as White or Asian (John & Carnoy, 2017; Zippia, 2023). Moreover, people who lack the benefit of preparatory privilege—that is, people who enter educational environments primed to succeed in computing due to early exposure in their home lives—and have not yet developed confidence in the content area may struggle to learn about and contribute to computer science education (Yadav et al., 2016). If EWIG: CS is to expand opportunities for historically underrepresented educators, it is important to understand the experiences of women, people of color, and educators who have not previously engaged with computer science.

At the same time, we want to understand the dynamics of the working environment that shape educators' ability to be successful. Grade-level settings can shape the degree to which teachers and administrators can incorporate computer science into students' learning opportunities effectively, and an accumulation of professional learning opportunities might also contribute to their ability to do so.

A set of regression analyses explored the degree to which changes in confidence varied based on respondent characteristics, including racial and gender identity and grade level served; and level of professional preparation, including prior experience with teaching computer science, number of times attending a Summer of CS workshop, and attendance at academic year workshops in the subsequent school year. With respect to changes in confidence between the beginning of the Summer of CS 2024 workshop and the follow-up survey in fall 2025, we found no differences among participants associated with personal characteristics or professional preparation. However, holding these other characteristics constant, we observed that the average growth in confidence for respondents serving non–high school students exceeded that of their high school peers. See Appendix E for the full regression output.

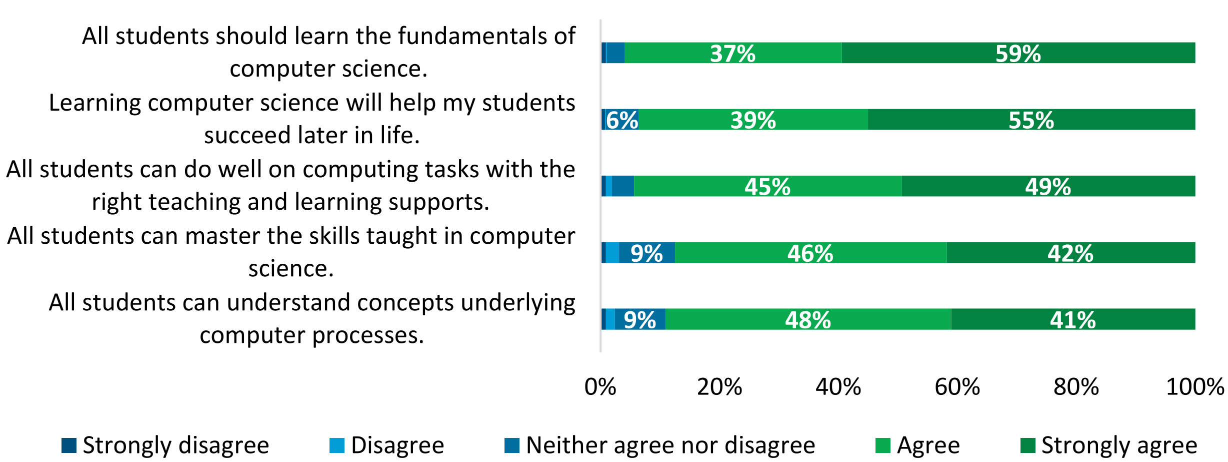
Changes in Participant Beliefs: Overall Results

Similar to measures of confidence, a set of five survey items explored participant beliefs about who should experience and be successful with computer science education. Exhibit 5 displays these items along with participant responses to them from the fall 2025 survey administration. For example, 42% of respondents strongly agreed and 46% agreed with the statement, "All students can master the skills taught in computer science." See Appendix F for a comparison of these responses across different survey administrations.

Key Finding #3

Survey responses revealed a positive and statistically significant change in beliefs about who can and should do well in computer science between the beginning of Summer of CS workshops and participants' return to the classroom 1–2 years later.

Exhibit 5. Follow-Up Survey Responses to Items in the Beliefs Scale

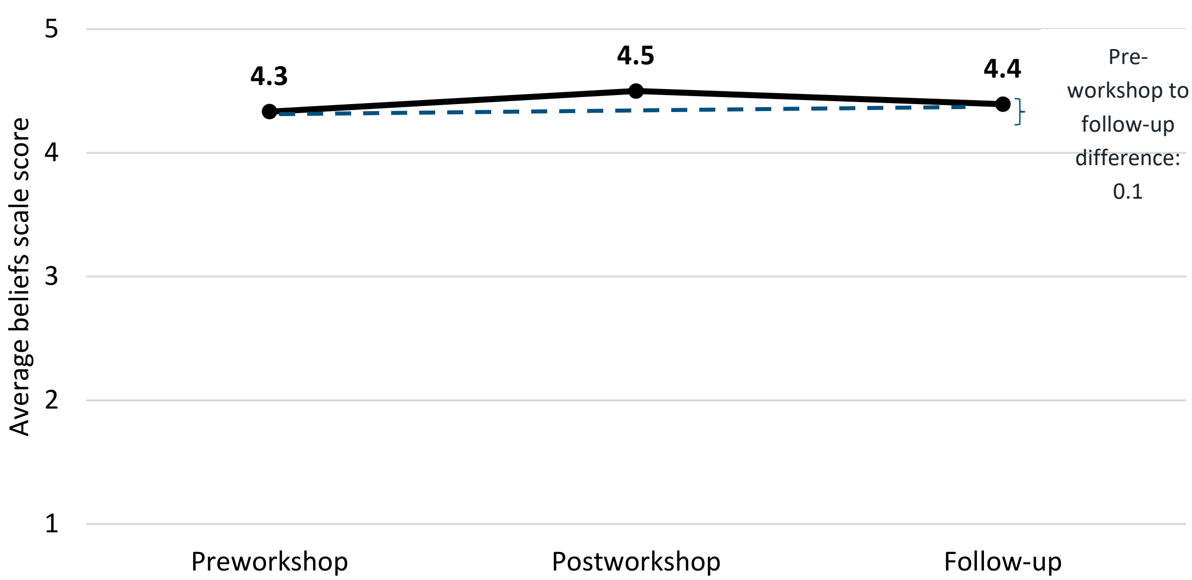


Note. *n*'s range from 665 to 676. Response categories with 5% or less do not have a data label. Categories may not total 100% due to rounding.

As for responses about confidence, the research team used the items from Exhibit 5 to construct a single survey scale that captured participant beliefs about computer science participation. (See Appendix C for a detailed description of the development of this survey scale.) Once again, we tracked changes in beliefs over time for the subset of participants from Summer of CS 2024 who responded to surveys at the beginning of their 2024 workshop, the end of their 2024 workshop, and in fall 2025.

Exhibit 6 shows results from this analysis. Consistent with findings from surveys administered before and after Summer of CS workshops in 2024 and 2025, the preworkshop beliefs scores for beliefs were higher than those for confidence, indicating that educators began their workshops already agreeing with these survey items at high levels. Despite these higher initial values for the beliefs scale, we still saw a positive and statistically significant change of 0.2 points between the beginning and end of the Summer of CS workshop in 2024. A year later, in fall 2025, self-reported beliefs about who can and should succeed in computer science had dropped, on average, by 0.1 points from the postworkshop levels. As with results about self-reported confidence, it is possible that the realities of classroom instruction in the year following the workshop tempered some of the positive feelings that respondents had reported immediately following Summer of CS. The overall finding nevertheless remains positive. From the beginning of the workshop experience to the follow-up survey administration after a year in the classroom, participants reported a positive and statistically significant average change in the beliefs scale. (See Exhibit 6.)

Exhibit 6. Changes in Average Beliefs Scale Score



Note. n = 353. Survey scale scores have been rescaled to the original Likert range of 1–5 for ease of interpretation.

Changes in Participant Beliefs: Subgroup Results

As with the scale measuring participant confidence, we examined differences among subgroups of participants through regression analyses that included racial identity, gender identity, computer science teaching experience, Summer of CS participation, and academic year workshop participation; grade levels served as independent variables. These analyses found only one consistent difference among subgroups: Members of the underrepresented racial identity group—that is, respondents who did not identify as White and/or Asian—had a lower level of change in beliefs between the beginning of their workshop in 2024 and the follow-up survey in fall 2025. See Appendix E for the full regression output.

Findings About Participant Behaviors

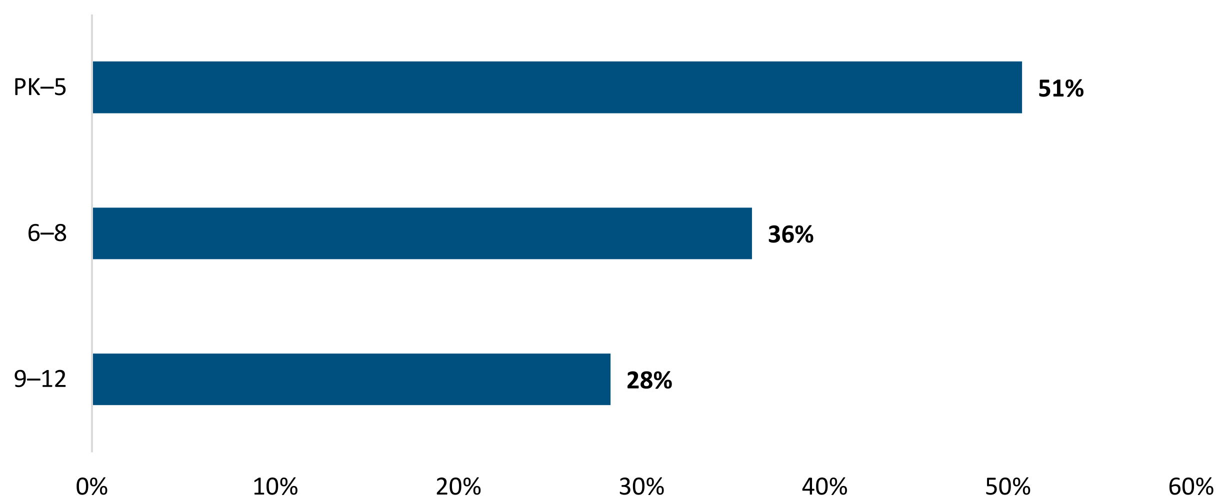
As with perceptions of workshop quality, reports of changes in confidence and beliefs offer promising signals about the effectiveness of professional learning experiences provided through Seasons of CS. However, they provide incomplete information about the degree to which opportunities for computer science education have improved. Given the stated goal of the EWIG: CS investment of “providing high-quality CS instruction and CS learning experiences,” we need to understand the degree to which quality learning translates into practice when educators return to their classrooms, schools, and districts. Self-reported data from the fall 2025 follow-up survey offer a window into the nature of computer science learning provided by workshop participants following their summer experience.

Students Taught

Consistent with the aims of the workshop program, a strong majority of workshop participants went on to incorporate computer science content into their classroom instruction. Eighty-six percent of respondents reported teaching computer science in some capacity during the 2024–25 school year. Roughly half of these educators served students in Grades PK–5, more than a third served middle-grades students, and more than one quarter reported delivering computer science education to students in high school (see Exhibit 7).

> **Key Finding #4**
>
> **Workshop participants delivered computer science instruction when they returned to their classrooms.**

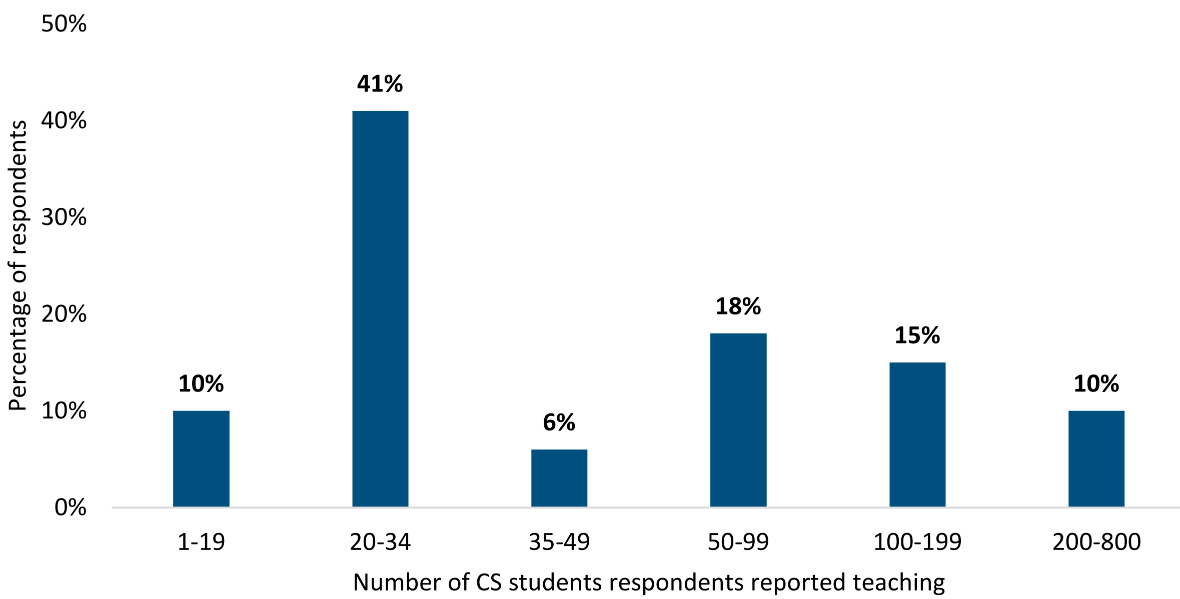
Exhibit 7. Grade Bands to Which Participants Taught Computer Science



Note. *n* = 583. Totals do not total 100% because this was a check-all-that-apply question.

Among educators who reported teaching computer science in 2024–25, survey respondents provided computer science learning opportunities for an average of 80 students. The average number of students served was highest for educators serving Grades 6–8 at 119. In contrast, educators who taught computer science to students in Grades Prekindergarten (PK)–5 taught an average of 72 students, and educators in Grades 9–12 taught an average of 83. Exhibit 8 shows the distribution of the number of students taught by grade level. For example, 10% of survey respondents taught computer science to between 1 and 19 students, whereas 41% of survey respondents taught between 20 and 34 students.

Exhibit 8. Number of Computer Science Students Taught



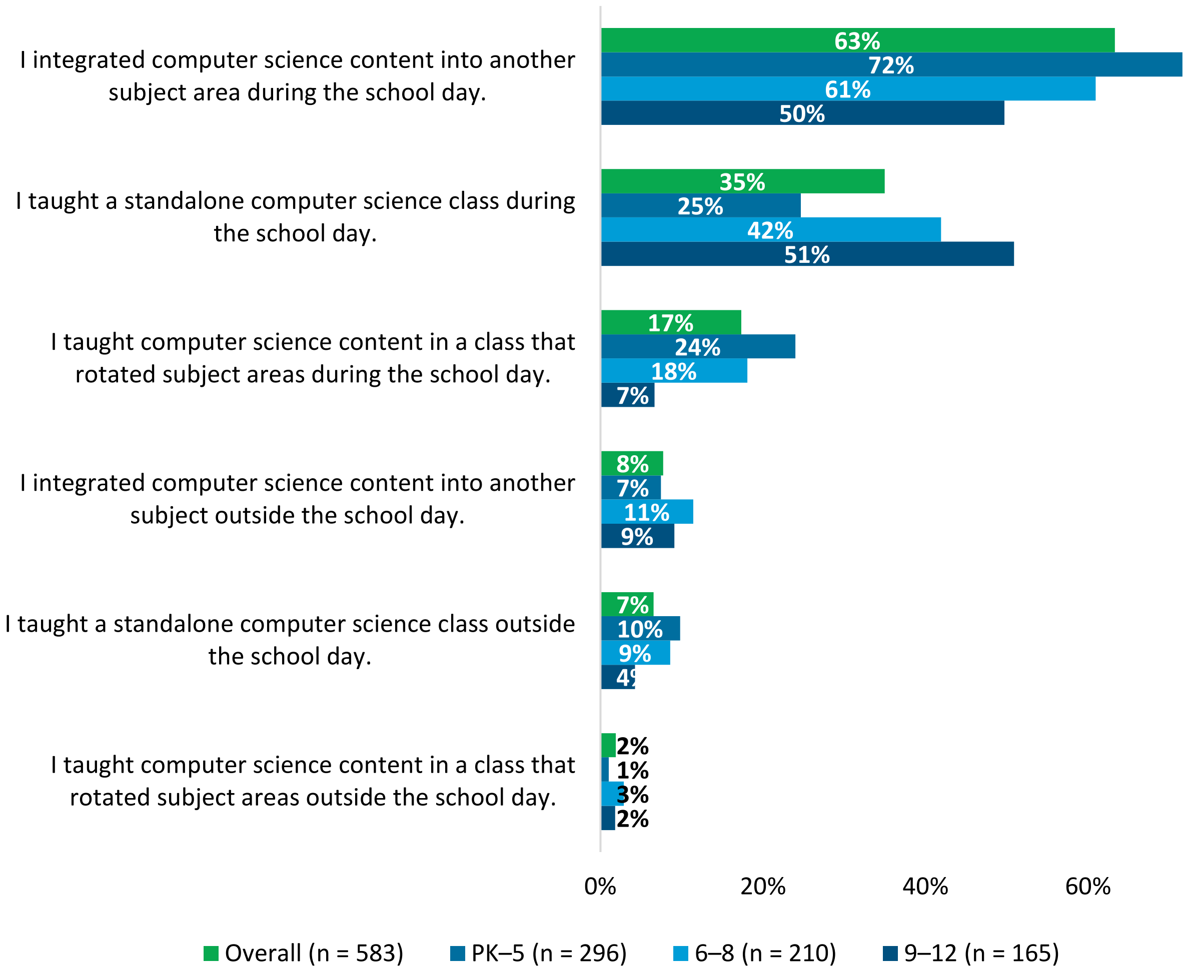
Note. *n* = 571.

Format of Computer Science Instruction

> **Key Finding #5**
>
> **The primary format of computer science instruction was the integration of content into another subject area; this was especially true in the elementary grades.**

Survey responses also offer details about the format of computer science instruction delivered by workshop participants. More than two-thirds of respondents indicated that they had taught computer science by integrating computer science content into another subject during the school day, whereas nearly four in 10 reported that they had taught a standalone computer science course during the school day. The teaching format varied by grade band. Nearly three-quarters of respondents serving Grades PK–5 indicated that they had taught computer science through integration, whereas only a quarter of these educators had taught a standalone class. In contrast, roughly half of high school educators had taught a standalone computer science class; nearly the same percentage reported integrating computer science into other subject areas. (See Exhibit 9.)

Exhibit 9. Computer Science Formats for Respondents Who Reported Teaching Computer Science by Grade Band



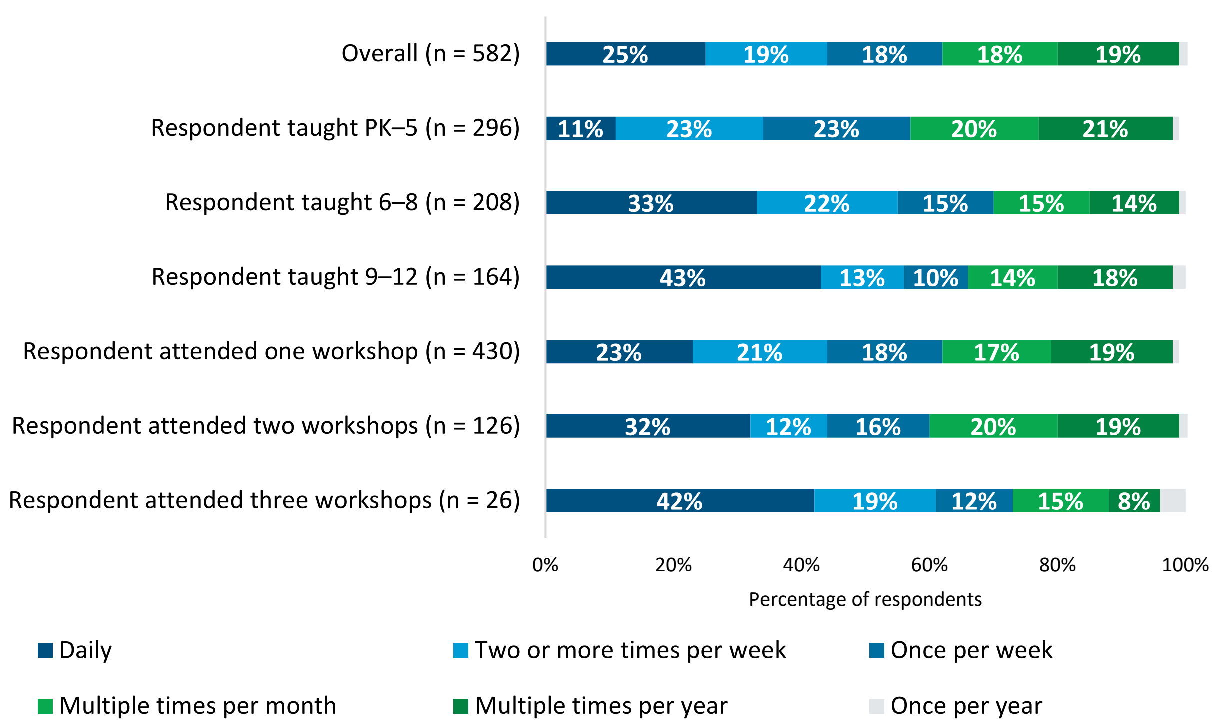
Note. Totals do not total 100% because both teaching format and grade level(s) taught were check-all-that-apply questions.

Dosage of Computer Science Instruction

Additional survey items revealed details about the frequency with which computer science instruction took place for workshop participants. Overall, one quarter of survey respondents reported teaching computer science daily in 2024–25, and nearly two-thirds reported teaching computer science at least weekly. However, frequency varied across several respondent characteristics. For example, 43% of respondents who had taught computer science to high school students did so on a daily basis, whereas only 11% of educators serving students in Grades PK–5 taught computer science every day.

We also see differences based on the level of engagement with Summer of CS. Among respondents who had attended Summer of CS in 2023, 2024, and 2025, 42% taught computer science daily, and nearly three-quarters did so at least weekly. In contrast, one quarter of respondents who had attended a single Summer of CS workshop taught computer science daily. Because of our research design, we were unable to determine whether educators' level of engagement with Summer of CS had caused them to implement CS instruction more frequently. For example, it is possible that educators who had experienced more professional development through multiple Summer of CS experiences felt better equipped to incorporate computer science into their instruction on a more regular basis. However, it is also plausible that educators who already had greater responsibilities for teaching computer science participated in the summer workshops to seek support for preexisting roles.

Exhibit 10. Frequency of Computer Science Instruction



Note. Grade level(s) taught was a check-all-that-apply question. Total workshops attended comes from SCOE registration data. Percentages may not total 100% due to rounding. Response categories with 5% or less do not have a data label.

In addition to measuring dosage through frequency, the survey also asked respondents to report their total number of hours of computer science instruction during the 2024–25 school year. As part of the workshop registration process, Summer of CS participants and an administrator in their organization both signed a participant agreement that stipulated that teachers and paraprofessionals would "implement CS instruction using curriculum and pedagogical strategies provided through this workshop during the school year" for a total of 30 hours in Grades PK–5, 50 hours in Grades 6–8, and 75 hours in Grades 9–12. Exhibit 11 displays the number of self-reported instructional hours in the 2025 follow-up survey. Across the 557 survey responses, participants reported teaching a total of 81,040 hours of computer science content in 2024–25. These educators had taught an average of 145 hours over the course of the school year, with higher average hours in higher grade bands. The exhibit also demonstrates that more than half of educators in each grade band, including nearly two-thirds of respondents in Grades 6–8, had met or exceeded the commitment in their participant agreement. Similar to the data presented in Exhibit 10, we saw higher average hours for educators who had attended more Summer of CS workshops.

Exhibit 11. Hours of Computer Science Instructional Time by Grade Band and Workshop Participation

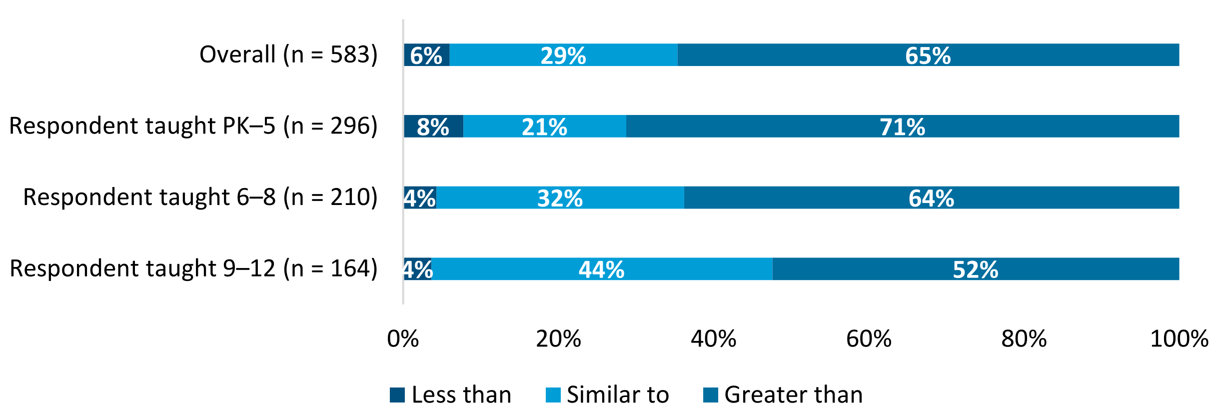
Grade band	Average hours	Grade band's expected hours	Percentage of respondents who met or exceeded expectation
Overall (*n* = 557)	145	N/A	N/A
PK–5 (*n* = 283)	87	30	55%
6–8 (*n* = 199)	199	50	62%
9–12 (*n* = 159)	227	75	55%
Respondent attended one workshop (*n* = 414)	126	N/A	N/A
Respondent attended two workshops (*n* = 118)	184	N/A	N/A
Respondent attended three workshops (*n* = 25)	292	N/A	N/A

Note. Grade level(s) taught was a check-all-that-apply question. Total workshops attended comes from SCOE registration data. Percentages may not total 100% due to rounding.

The preceding text and tables provide promising evidence that participants in Summer of CS workshops go on to deliver computer science instruction to students when they return to their schools. However, our study methods do not permit us to determine whether an increase in computer science teaching is caused by workshop participation. In addition, because factors like recall bias might have impaired our ability to capture data accurately, we did not attempt to measure the hours of instruction delivered in the year *before* workshop participation. Nevertheless, the survey did ask participants to indicate whether the number of hours taught in 2024–25 was greater than, similar to, or less than the hours in the year before they had first participated in a Summer of CS workshop.

Nearly two-thirds of respondents indicated that they had taught more hours of computer science after Summer of CS than they had before. This is especially true for educators in elementary grades, where 71% responded that their hours had increased. In contrast, 52% of high school educators reported teaching more hours of computer science in 2024–25 than in the year before their workshop. This is perhaps unsurprising. Standalone computer science courses are more common at the high school level and are more likely to have a standard number of hours dedicated exclusively to computer science content. Alternatively, educators who are integrating computer science content into other subject areas may have more room for growth as they become more comfortable with computer science content and pedagogical approaches. (See Exhibit 12.)

Exhibit 12. Comparison of Hours of Computer Science Teaching in 2024–25 to the School Year Before the First Summer of CS Workshop

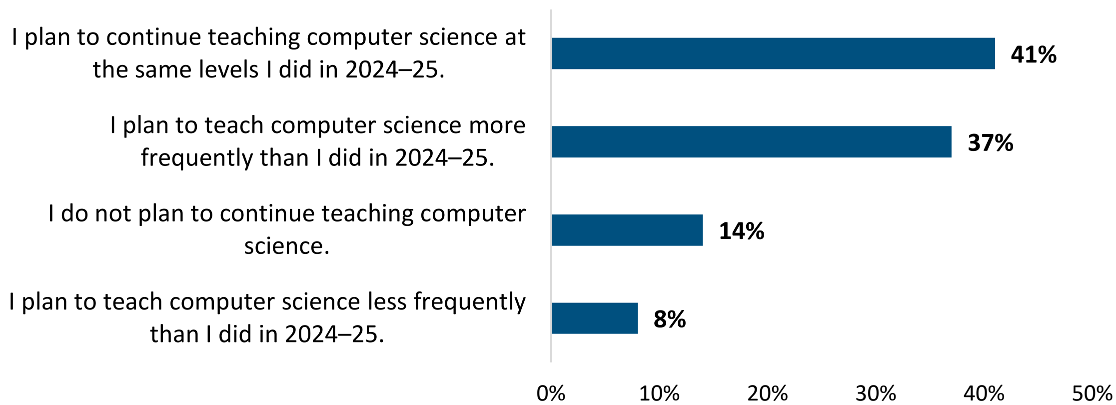


Note. Grade level(s) taught was a check-all-that-apply question. Total workshops attended comes from SCOE registration data. Percentages may not total 100% due to rounding.

Plans for the Future

Questions about participant behaviors concluded by addressing plans for the future. Approximately four in 10 respondents (41%) shared plans to teach computer science at the same frequency as they had in 2024–25, and nearly as many (37%) indicated that they planned to teach computer science more frequently. In contrast, 14% of respondents did not plan to continue teaching computer science. (See Exhibit 13.)

Exhibit 13. Respondents' Plans for the Future



Note. *n* = 671.

Findings About Resources and Supports Needed

Educator knowledge, skills, dispositions, and behaviors play an instrumental role in shaping opportunities for students to learn computer science content. Indeed, survey results shared in this report provide some insight into the degree to which workshop participants grew professionally and created learning experiences for students in the year(s) following Summer of CS. However, many factors beyond teachers' control influence their ability to succeed in teaching computer science. A final set of survey questions sought to better understand the resources and supports needed for success.

Key Finding #6

Important needs remain for resources and support to enable computer science instruction to capitalize on positive changes in educator capacity.

The analytic approach and results described in this section of the report aim to highlight discrepancies between the importance and availability of key resources and supports for computer science education. Our goal is to draw attention to the tools that are currently insufficient to meet educators' needs.

Resources to Improve Computer Science Education

The first set of survey items asked respondents to assess the importance and availability of resources to improve computer science education—that is, the software, hardware, and instructional materials that educators can use as part of their instructional experience. The survey gathered respondent opinions about each of eight resources in two ways. First, the survey asked how important a given resource was. Next, the survey asked about the extent to which respondents had access to each resource. See Appendix G for participant responses to these individual items. To understand where respondents experienced discrepancies between important resources and the availability of those resources, the research team converted responses into numerical values by assigning to the questions about importance the response *Very important* as 4, *Moderately important* as 3, *Slightly important* as 2, and *Not at all important* as 1. Similarly, AIR converted responses about availability into numerical values, this time assigning *To a great extent* as 4, *To some extent* as 3, *To a small extent* as 2, and *Not at all* as 1. The team then calculated the average difference between each person's responses about importance and availability to identify the resources with the greatest discrepancies. A positive number indicates that the need for a given resource is greater than its availability; a negative number indicates that the availability of a resource is greater than its need.

Exhibit 14 lists each of the eight resources, along with the difference between importance and availability for all respondents and by grade band. The largest discrepancy was in resources for integrating computer science into other subjects; at 0.75, this difference was nearly a full point on the Likert scales that respondents used to answer these survey items. Although most responses were comparable across grade levels, responses for some resources revealed greater challenges at the elementary level. Teachers serving Grades PK–5 reported substantially larger needs for ready-to-use curricula or lesson plans and unplugged computer science learning resources than did other grade levels.

Survey responses about resources also suggested some areas in which teachers did not experience challenges in accessing tools critical for their success. Average responses for the importance and availability of student access to internet-connected devices, both at home and at school, were nearly identical.

Exhibit 14. Gaps in Resources for Computer Science Instruction

Resource	Average difference between importance level and availability level			
Grade band	**Overall**	**PK–5**	**6–8**	**9–12**
Resources for integrating computer science into other subjects	0.75	0.75	0.74	0.72
Software or platform licenses	0.59	0.57	0.54	0.56
Access to software or websites from within the district network	0.55	0.51	0.50	0.59
Ready-to-use curricula or lesson plans	0.54	0.72	0.46	0.28
Data and assessment tools	0.47	0.50	0.42	0.50
Unplugged computer science learning resources (i.e., activities that do not use digital devices)	0.42	0.49	0.38	0.31
Student access to internet-connected devices at school	0.03	-0.02	0.06	0.10
Student access to internet-connected devices at home	0.02	0.03	-0.09	0.14

Note. Overall, *n*’s ranged from 560 to 569 and include only respondents who reported teaching computer science in 2024–25. Grade PK–5 *n*’s ranged from 287 to 291. Grade 6–8 *n*’s ranged from 202 to 205. Grade 9–12 *n*’s ranged from 153 to 161.

Supports to Improve Computer Science Education

The second set of items asked respondents to assess the importance and availability of supports to improve computer science education—that is, the money and human connections that foster professional learning and engagement in computer science. As with items about resources, the survey asked respondents about each of 13 supports in two ways. First, the survey asked how important a given resource was. The research team converted responses to numerical values by assigning the response *Very important* as 4, *Moderately important* as 3, *Slightly important* as 2, and *Not at all important* as 1. Next, the survey asked about the extent to which respondents had access to each resource. See Appendix G for participant responses to these individual items. AIR researchers also converted these responses about availability into numerical values, this time assigning *To a great extent* as 4, *To some extent* as 3, *To a small extent* as 2, and *Not at all* as 1. The team then calculated the average difference between each person's response about importance and availability to identify the supports with the greatest discrepancies.

Exhibit 15 lists each of the 13 supports, along with the difference between importance and availability for all respondents and by grade band. Note that the needs identified for many of the supports listed in the survey are larger in magnitude than for items about resources: the discrepancy between importance and availability was larger for seven items in Exhibit 15 than any of the items in Exhibit 14. The largest of these was for an instructional materials budget for computer science; at 1.22, this difference was more than a full point on the Likert scales that respondents used to answer these survey items.

Exhibit 15. Gaps in Supports for Computer Science Instruction

Support	Average difference between importance level and availability level			
Grade band	**Overall**	**PK–5**	**6–8**	**9–12**
Instructional materials budget for computer science	1.22	1.31	1.19	1.05
Stipends or extra pay for professional development in computer science offered outside contract time	1.07	1.06	0.94	1.06
Time to plan computer science instruction	1.06	1.11	0.91	1.07
Content-focused coaching or mentoring in computer science	0.97	1.03	1.02	0.68
Relationships with external partners	0.88	0.89	0.83	0.85
District administrator support for computer science	0.85	0.85	0.85	0.85
A community of practice or professional learning community of other computer science educators	0.81	0.78	0.83	0.74
School administrator support for computer science	0.74	0.78	0.62	0.73
Parent and community engagement in computer science	0.72	0.68	0.73	0.74
Time to teach computer science content	0.69	0.87	0.49	0.59
Ongoing connections with other Summer of CS workshop participants	0.50	0.58	0.50	0.38
Ongoing connections with my Summer of CS workshop facilitator	0.42	0.52	0.40	0.25
Student interest in computer science	0.42	0.26	0.45	0.62

Note. Overall, *n*'s ranged from 548 to 568 and include only respondents who reported teaching computer science in 2024–25. PK–5 *n*'s ranged from 280 to 291. Grade 6–8 *n*'s ranged from 197 to 207. Grade 9–12 *n*'s ranged from 153 to 159.

Some differences by grade level may merit further exploration. Once again, most responses were comparable across grade levels. However, responses for teachers from Grades PK–5 suggest a more intense need for time to teach computer science content. This is perhaps unsurprising, given the higher percentages of teachers at these grade levels who taught computer science by integrating it into other content areas rather than as a standalone class. Teachers serving Grades PK–5 and 6–8 also reported a greater discrepancy between importance and availability than did their peers in Grades 9–12 for content-focused coaching or mentoring in computer science. Another survey item suggested a more pronounced need at the high school level: Although the magnitude of the difference between importance and availability was lower than for most other items, teachers of students in Grades 9–12 reported a higher discrepancy than their counterparts in other grade levels for student interest in computer science.

Next Steps for the EWIG: CS Evaluation

Evaluation activities for EWIG: CS are nearly complete. This report complements previous examinations of the Summer of CS participant experience and a report on the role of Computer Science Champions. Please see the October 2024 report, *Summer of CS 2024 Survey Findings*; the March 2025 report, *CS Champions Survey and Focus Group Findings*; and the October 2025 report, *Summer of CS 2025 Survey and Focus Group Findings* for additional details.[5] Together, the findings in these publications provide insights about five of the research questions outlined in Exhibit 1, specifically Research Questions 1–4 and 7.

One study component remains to complete. Forthcoming case studies of six school districts across the state of California will address Research Questions 6 and 7 by exploring computer science course availability and participation and the factors that can shape the expansion of computer science learning opportunities.

[5] All publications from this evaluation are available at https://www.air.org/project/evaluation-educator-workforce-investment-grant-computer-science

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