## Technical Review Coversheet

### Applicant:
Computer Science Teachers Association LLC (U411C190048)

### Reader #1:
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### Priority Questions

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Technical Review Form

Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #1: **********
Applicant: Computer Science Teachers Association LLC (U411C190048)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

   (1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

   (2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

The applicant provides adequate details to show the understanding of the problem by discussing that English Learners (EL) are unique in that they are continuously entering and exiting EL classifications making it challenging to assess long term outcomes for English Learners. (pp. 3)

The applicant also provided clear details to show that district and state English Learner reclassification policies vary which resulting in an English Learner in one district or state may not be considered in another state or district. (pp. 3)

The application provided strong details to show that English Learners may have reduced chances to take college preparatory coursework due to time in English Language Development classes. (pp. 3)

The applicant provided clear details by discussing that there is a profound equity gaps in computer science for our nation's young women and students of color who have long experienced low participation rates in computer science classes which leads to difficulties in diversity issues in the computer science workforce. (pp. 2)

The applicant provides compelling details to show their project involves the development of promising new strategies by writing that they propose to use California Reading and Literature Project will include teacher leaders that will create and facilitate Professional Development designed to help secondary teachers analyze language demands embedded in course context and plan instruction that effectively engages English Learners while maintaining rigor. (pp. 5)

Weaknesses:

None noted.

Reader's Score: 25

8/16/19 1:53 PM
Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

   (1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.

   (2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.

   (3) The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

The applicant provided very clear objectives and performance measures. For example, the applicant discussed their objective of increasing the percentage of English Learners enrolling in AP classes, take the AP exam, and earn a qualifying score on the exam by measurement that include examining their official transcripts, AP exam enrollment numbers, and AP exam scores (pp. 11).

There is clear evidence provided to show the underlying conceptual framework of the project by the applicant providing a logic model which shows key components such as curricular and pedagogical resources to support computer science teachers along with mediators that include a shift in computer science teachers focus, and increased awareness of computer science courses among English Learner students engagement in computer science. In addition, the logic model also includes teaching strategies with EL students and replication of professional development and professional learning communities. (e115)

The conceptual framework of the project is compelling because the applicant provides details to show that their main focus if professional development for teachers will weave Effective teaching for English Language Learners framework in to computer science professional development offerings for administrators to help them understand how to support the design of more engaging classrooms and path ways that prepare English Learners to participate more fully in personal and civic problem solving. (pp. 13)

The applicant provided adequate details to show continuous improvement by discussing that in Year 1 program team members will work closely together to build formative feedback loop with educational leaders to collect and analyze data related to English Learner access to computer science in High school. (pp. 14)

The applicant provided strong evidence to show that real time platform analytics from the Communities of Practice annual evaluation forms and surveys, critical incident essays, and content analysis of discussions and teacher learning products will be used to assess the immediate value of program activities, the potential value for practice, applied value to the classroom, and actual evidence of change in teachers’ practices and student learning. (pp. 13, 14)

To show strong evidence of providing feedback the applicant also wrote that a key component of equity audits and the evaluation feedback loop will be the incorporation of student data and student voice participation in focusing both program designers, teachers and administrators on increased recruitment. (pp.14)

To show adequate evidence of providing feedback the applicant also wrote that intervention, equity audits, and evaluation data will feed back into the program design to affect practice, prototyping, testing and retesting planning. (pp.14)
Weaknesses:
The applicant did not provide a measurable objective for increasing grades in Advance Placement or in the increase in the percentage of qualifying scores on the Advance Placement exam. (pp. 11)

Selection Criteria - Adequacy of Resources/Quality of Management Plan

1. The Secretary considers the adequacy of resources and the quality of the management plan for the proposed project. In determining the adequacy of resources and quality of the management plan for the proposed project, the Secretary considers the following factors:

   (1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.

   (2) The qualifications, including relevant training and experience, of key project personnel.

   (3) The potential for continued support of the project after Federal funding ends, including, as appropriate, the demonstrated commitment of appropriate entities to such support.

Strengths:
The applicant provides a strong management plan that includes milestones and timelines related to implementation and training of teachers providing feedback from students, teachers and administrators along with staff responsible and a yearly calendar to provide guidance with timelines from pre grant to Year 5. (pp. 16)

Adequate evidence is provided by the applicant to show persons responsible and activities to be accomplished. For example, the applicant wrote that the project director will oversee the leadership of the computer science for ELs including convening the project team to ensure strong management of the grant. (pp. 17)

Clear details are providing to show experiences of key project personnel. For example, the applicant wrote that the project Director is the Executive Director of Computer Science Teacher Association and is also a former high School computer science teacher, department chair and professional development provider. (pp. 18)

The applicant also provides strong details to show experience of another key staff member by describing the staff facilitator as having teaching experience at the University of California with a research emphasis on computing education particularly in introductory programming, pedagogical practice affecting student outcomes and K through 12 teacher preparation and professional development. (pp. 18)

To show adequate details for sustainability the applicant also discussed that they will extend the reach of intervention beyond the target sites, and will also develop reusable tools and local capacity to lead professional development. (pp. 19)

Clear details are provided by the applicant to show sustainability of the program beyond the life of the grant by discussing that the program team will come together annually to beginning in the summer of year 2 of the grant to develop at least two local facilitators per Computer Science Teacher Association chapters to help support the program beyond the grant

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Weaknesses:
The applicant provides abbreviations that are not clearly defined. For example, they use DE, CRM without providing any details. (pp. 16)

Reader’s Score: 18

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

1. Within Absolute Priority 3, we give competitive preference to applications that address the following priority:

Projects designed to improve student achievement or other educational outcomes in computer science (as defined in the notice). These projects must address the following priority area:

Expanding access to and participation in rigorous computer science (as defined in the notice) coursework for traditionally underrepresented students such as racial or ethnic minorities, women, students in communities served by rural local educational agencies (as defined in the notice), children or students with disabilities (as defined in the notice), or low-income individuals (as defined under section 312(g) of the Higher Education Act of 1965, as amended).

Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:
The applicant provided adequate details to show that one of their objectives is to increase achievement and attainment of high needs student populations in STEM disciplines. (pp. e18)

The applicant provided adequate details to show their expanding access to and participation in rigorous computer science coursework. For example, the applicant wrote that each of the two cohorts of THRIVE will include a group of new computer science teachers form their Career and Technical program. (pp. 4)

Weaknesses:
None noted.
## Technical Review Coversheet

**Applicant:** Computer Science Teachers Association LLC (U411C190048)

**Reader #2:** ********

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Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #2: **********
Applicant: Computer Science Teachers Association LLC (U411C190048)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

   (1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

   (2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

(1) This project proposes to provide professional development and create professional learning communities (PLCs) for K-12 CS and AP CS teachers in California, New Mexico and Arizona by leveraging membership in the Computer Science Teachers Association (CSTA), the California Reading and Literature Project (CRLP) and the UC San Diego’s Education Studies Department to attract, retain and engage English Learners (ELs) and former ELs (referred to in the project as “ever ELs” in AP CS. (page 5)

(2) This proposal is unique in that the project team will begin with an equity audit process to gather information, observe classrooms, interview teachers and talk to groups of ELs. They will then engage principals and counselors in a sequence of professional development for a full academic year to leverage the results of the equity audit and share course placement plans for ELs in Computer Science. (page 8)

Weaknesses:

This reviewer found no weaknesses in the significance of the proposed project.

Reader’s Score: 25

Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

   (1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.

   (2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.
The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

(1) Four specific goals are identified in Figure 2 (pp 10-11) and include increasing AP enrollment for EL students, increasing the percentage of qualifying scores on the AP CSP exam for ELs, increased grades in AP CSP and increased ELA proficiency in these populations.

(2) The conceptual framework used is the SSTELLA model. This model is designed to prepare teachers to integrate science, language, and literacy instruction for ELs but will be used in this project for a computer science context. (page 9)

(3) This project proposes to perform an equity audit to provide baseline data and to build a formative feedback loop during the first year of the project. (page 13). The process includes monthly informal and quarterly formal updates with program teams and district/school leaders (page 14) along with student voice participation.

Weaknesses:

(1) On page 11, Figure 2, Goals 2 and 3 propose “increase by x%” yet x is neither defined nor explained.

(2) The SSTELLA model is based on an evidence-based elementary model (ESTELL). The ESTELL logic framework was based on students classified as English Learners but is used here for teachers rather than students. No evidence is provided to support the assumption that this model will be effective with teachers and/or with high school students instead of elementary students. (page 9)

Reader's Score: 32

Selection Criteria - Adequacy of Resources/Quality of Management Plan

1. The Secretary considers the adequacy of resources and the quality of the management plan for the proposed project. In determining the adequacy of resources and quality of the management plan for the proposed project, the Secretary considers the following factors:

   (1) The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.

   (2) The qualifications, including relevant training and experience, of key project personnel.

   (3) The potential for continued support of the project after Federal funding ends, including, as appropriate, the demonstrated commitment of appropriate entities to such support.

Strengths:

(1) A management plan is outlined (page 16) and includes specified pre-grant activities along with activities for each of the five years. These activities are defined in the narrative and include communications, training, a summer institute for teachers, student study sessions, annual updates and a complete evaluation.

(2) Key project personnel are well-qualified. All have years of relevant training and experience with teacher development and teaching computer science.

(3) The project proposes to ensure continued support of the project by providing an annual training summit tied to the CSTA annual conference, building on the success of past summits to develop local leadership.

(4) This project develops reusable tools and local capacity (through CSTA chapters) to lead professional development. (page 19)
Weaknesses:

(1) The management plan uses abbreviations (DE, CRM) to assign responsibility but does not explain these abbreviations. (page 16) This reviewer was unable to determine the meaning of these abbreviations.

(2) There is question as to the sustainability of the project. It is not clear if or how support for future teacher development will be provided beyond an annual training summit. Will the Professional Learning Communities continue? How would that be funded? What about new CS teachers who cannot attend the summit?

Reader’s Score: 18

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

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Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:

(1) This project proposes to increase participation in CS and in AP CS courses by EL and forever EL students in three states by providing professional development and support for high school teachers, counselors and principals.

(2) During the first year of this project, professional development will be provided for principals and counselors at participating schools to identify and reflect on practices that are hindering or facilitating success for ELs in CS. They will also share their course placement plans. (page 8)

Weaknesses:

This reviewer found no weaknesses in this area.
## Technical Review Coversheet

**Applicant:** Computer Science Teachers Association LLC (U411C190048)  
**Reader #3:** **********

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**Competitive Preference Priority**

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**Total**

| Total             | 85              | 76            |
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Panel #25 - EIR Early Phase Tier 1 - 24 - 1: 84.411C

Reader #3: *********
Applicant: Computer Science Teachers Association LLC (U411C190048)

Questions

Selection Criteria - Significance

1. The Secretary considers the significance of the proposed project. In determining the significance of the proposed project, the Secretary considers the following factors:

   (1) The potential contribution of the proposed project to increased knowledge or understanding of educational problems, issues, or effective strategies.

   (2) The extent to which the proposed project involves the development or demonstration of promising new strategies that build on, or are alternatives to, existing strategies.

Strengths:

1) The applicant proposes a program to develop curricula and teacher training for a Computer Science training program for high school students who are English language learners or who have previously been identified as English language learners. The applicant does an outstanding job of providing data that English language learners being significantly underrepresented in Computer Sciences programs, taking Advanced Placement (AP) Computer Sciences courses and passing the AP Computer Science examination (pages e23-e24). Although the proposal targets the curricula and teacher development programming at students and teachers in San Diego County, CA and the states of Arizona and New Mexico, the program should be able to be disseminated to other school systems around the U.S. with students who are English Language learners. Furthermore, the applicant, the Computer Science Teachers Association, is well positioned to disseminate the program to those teachers in other states. The identified financial support from Microsoft (pages e119-120) further indicates the likely contribution this effort may have on increasing the number of underrepresented individuals in the computer science workforce.

2) The proposed project partners individuals with Computer Science expertise from the Computer Science Teachers Association with other educators from the California Reading and Literature Project who have developed literacy programs for students who are English Language learners. This collaborative effort should allow the applicants to build off of successful strategies used to develop literacy programming for English language learners and translate that into new curricula for that student population in the discipline of Computer Science. The decision to use the SSTEELA framework for the Computer Science curriculum development (SSTEELA is explained in the Appendix on pages e122-e147) should be successful and incorporates current ideas for best practices in educational training. The STTEELA framework relies on sound pedagogy, but this effort should result in generating useful research data to support its more widespread use in STEM teaching. Furthermore, the two project participants from University of California San Diego have extensive experience in developing programming for English language learners. Although the new curriculum will need to be developed for Computer Science students and their teachers specifically, the strategies should be very similar to issues encountered with developing other earlier programs for English language learners. The applicant provides a bibliography with references to strategies in curricular development for English Language learners and the applicants have published studies specifically in that research area.

Weaknesses:

1) The efforts outlined in this proposal should significantly contribute to our understanding of the educational problems in deliver educational programming in Computer Science for high school students who are English language learners and best practices for addressing those identified problems. Furthermore, the Computer Science Teachers Association seems to be best positioned as a national organization of computer science teachers to disseminate the results of their
efforts to other teachers and school systems around the country. Previous success in their ability to effectively disseminate curricular materials is evidenced on pages e25-26.

2) Previous ESTELL strategies have been used to successfully develop science literacy skills for English language learners. Although the applicant has proposed that this strategy should be translatable for use in the development of teacher and student programs for Computer Science Education, there is no guarantee that will be achievable. Since training materials will need to be developed in the early phases of the program, there is no guarantee that the applicant will be able to utilize past successful ESTELL strategies to develop these Computer Science training resources. Nevertheless, since Computer Science is a STEM discipline, the ESTELL strategies should be applicable to Computer Science instruction and curriculum development.

Reader's Score: 23

Selection Criteria - Quality of Project Design

1. The Secretary considers the quality of the design of the proposed project. In determining the quality of the design of the proposed project, the Secretary considers the following factors:

   (1) The extent to which the goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable.

   (2) The extent to which there is a conceptual framework underlying the proposed research or demonstration activities and the quality of that framework.

   (3) The adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

1) The project goals, objectives, and measures are defined in Figure 2 on page e30. Measures are listed for each of the program goals and are appropriate for the identified specific objectives. The inclusion of an additional 4th program goal of improving student performance on the ELA exam for participating students, although not related to the EIR program, is admirable and will help the students to achieve success in their future Computer Science activities.

2) The applicant proposes to use the ESTELL (Effective Science Teaching for English Language Learners) as a starting point for the conceptual framework for their Computer Science program CSforEL (page e148). The underlying sociocultural research as described on pages e32-e33, is well thought out and tested and should provide an strong framework for the development of the Computer Science educational program. The applicant included an attachment in the Appendix on page e148 describing the underlying framework, and the logic seems appropriate. Since Computer Science is a science, it should work. The emphasis on personal and civic problem solving is also a plus factor.

3) The applicant proposes to have the program staff (designers and evaluators) work closely with participating school administrators and teachers. The plan places a strong emphasis on participation by the school administrators (principals and counselors) in addition to the teachers as described in pages e33-e34. The plan to use focus groups for feedback and an equity audit process (page e34) are definite strengths. The plan to use collected data for continuous quality improvement at monthly informal and quarterly and annual updates is also a strength. Another strength will be the participation of students in this feedback process (page e34), giving the students a voice, rather than relying solely on the feedback from administrators and teachers. The suggestion by the applicant that they will try to make the results of this continuous quality improvement process efficient to ensure meaningful suggestions are incorporate in a timely manner is also a strength.
Weaknesses:

1) Some of the program objectives listed in Figure 2 on page e30 seem incomplete. For instance, all of the targets for increasing the percentage of qualifying scores improvements are listed as X%. Although this may have been an oversight, it questions what kind of improvement in scores the applicant is targeting.

2) The ESTELL conceptual frame has been mostly described for use in student training. Since the applicant is proposing to use this conceptual framework for teacher development, it is not entirely clear that the literature supports that specific use. However, the applicant believes using the framework for teacher development will demonstrate its usefulness in the classroom with students and model the process.

3) There are no apparent weaknesses in the described process for evaluation, feedback and quality improvement of the proposed project.

Reader’s Score: 32

Selection Criteria - Adequacy of Resources/Quality of Management Plan

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   (2) The qualifications, including relevant training and experience, of key project personnel.

   (3) The potential for continued support of the project after Federal funding ends, including, as appropriate, the demonstrated commitment of appropriate entities to such support.

Strengths:

1) A management plan with milestones, responsibilities and a timeline is included on page e36. Budget seems appropriate for the scope of the project and the planned activities.

2) The qualifications, including educational training and past experience of the key personnel are outstanding. The project administrator Jake Baskin is the Executive Director of the Computer Science Teachers Association (page e54), perhaps the best positioned organization for the development and dissemination of a Computer Science educational program for high school students. Dr. Deborah Hernandez (pages e55-e57) is the Executive Director of the California Reading and Literature Project, whose previous program for enhance training and literacy for English language learners will serve as the paradigm for this Computer Science education proposal. The two faculty members from UC San Diego, Simon (pages e58-e69) and Hopkins (pages e70-e85), have extensive experience in similar program development and implementation as evidenced by their CVs and publication lists. Other program participants are similarly qualified.

3) The proposal contains strong letters of support from the participating school districts indicate the schools will be invested in the program the establishment of a community of practice and training for the Computer Science teachers should encourage the programming to extend when program funding ends, as the knowledge and training will persist. Participation of members in the Computer Science Teachers Association Leadership Summit is especially strong, indicating chapter leadership at the local level should be strong and able to continue mentoring programs and teacher development. Faculty development activities should support continued success. Furthermore, the success of English language learners in the program should provide role models for other EL students. The significant financial support from the Computer Science Teachers Association and Microsoft ($1,000,000) (page e117-e120) also indicates a commitment to the success of the program.
Weaknesses:

1) Although a management plan with milestones, responsibilities and a timeline is included on page e36, the goals and objectives associated with each milestone are not clearly identified in the table or elsewhere in the proposal. Furthermore, measurements of program success as identified in the Appendix on page e156 are very limited (increasing enrollment of English language learners enrolled in AP Computer Science courses and increasing the qualifying scores of English language learners on the AP Computer Science examination). There are an inadequate number of quantitative targets to identify achievement of success related to the other goals and objectives of the program. Although evidence of enhanced scores for underrepresented students on the Computer Science AP course is important, it would also be helpful to monitor numbers of students taking the examination also. Measures of student and teacher satisfaction with project programming should also be included as measures of program success.

2) There are no identifiable weaknesses in the relevant training and experience of the key project personnel listed in the proposal.

3) There is no specific identifiable weakness in the proposal related to the potential for the successes of the program (such as increased enrollment and pass rates) to be sustained after the external funding runs out. However, there is no assurance that financial resources to pay for summer teacher development training will be provided after Department of Education funding runs out.

Reader's Score: 16

Priority Questions

Competitive Preference Priority - Competitive Preference Priority

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Projects designed to improve student achievement or other educational outcomes in computer science (as defined in the notice). These projects must address the following priority area:

Expanding access to and participation in rigorous computer science (as defined in the notice) coursework for traditionally underrepresented students such as racial or ethnic minorities, women, students in communities served by rural local educational agencies (as defined in the notice), children or students with disabilities (as defined in the notice), or low-income individuals (as defined under section 312(g) of the Higher Education Act of 1965, as amended).

Note: Projects addressing this priority must be administered in a manner consistent with nondiscrimination requirements contained in the U.S. Constitution and Federal civil rights laws.

Strengths:

The applicant has specifically proposed a program to increase the number of underrepresented students who are English Language learners who take AP Computer Science courses in high school in Arizona, New Mexico and San Diego County in California, and improve the pass rate on the AP examination for those same students. Furthermore, the proposal documents that their target student population has financial need (low income). The program as proposed should be able to achieve those goals, indicating they meet the competitive preference priority.

Weaknesses:

There is no identified weakness in this proposal as it relates to establishing a program which provides access to Computer Science for students from underrepresented backgrounds from low income households.