U.S. Department of Education - EDCAPS
G5-Technical Review Form (New)
## Technical Review Coversheet

**Applicant:** Winchester School Board (U411C190012)

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

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Technical Review Form

Panel #22 - EIR Early Phase Tier 1 - 25: 84.411C

Reader #2: **********
Applicant: Winchester School Board (U411C190012)

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 proposed METRICS program combines informal and formal STEM interventions at the K-4 levels, drawing together a variety of potential innovations into a single immersion experience. This approach provides a systematic way to explore the impacts of a STEM focus in these grade levels, which may contribute to the literature on impacts of STEM confidence and identity at the elementary levels. Further, both schools participating are Title 1 (p 3) providing insight into the impact of interventions on a particular group of students and teachers. By relying on fairly common interactions, such as teacher PD and PLCs (p 8), STEM immersion experiences (p 8), content integration (p 6-7), and activities for students, the project appears to be true to the idea of a STEM ecosystem in a localized, context specific way. As such, it does offer potential for developing a model for other schools to develop similarly localized and specialized partnerships and immersion experiences by connecting real world “tethers”, or informal STEM experiences, (p 15) to formal STEM experiences in the classroom. The project builds on prior experience with some of the selected strategies, including the PEDLE program (p 6) and on existing strategies and freely available resources, such as CS First, Scratch, and PBS Squad Global (p 6), similarly increasing the likelihood that others may be able to build upon the ideas generated by the METRICS project. Specifically, the project employs these components as connections to the community and opportunities for personalized learning, providing context and intentionality in their use that is often missing in informal STEM learning. The idea of micro-credentialing (p 8) is timely, and pursuing a systematic review of its use in professional development of teachers is likely to produce some helpful results.

Weaknesses:

The project appears to build a number of competitions and activities for participants (p 19) rather than engaging participants in existing competitions or networks, the use of which may provide a more evidence-based foundation on which to build the project.

Reader’s Score: 24

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:
METRICS includes a clear approach to accomplishing an immersion experience in STEM for the two participating elementary schools and articulates three specific strategies for doing so along with their resulting outputs (p 1, 10). The steps to initiating these strategies are provided in Table 2 (p 11-12) and appear to be well ordered and quantified for the purposes of measurement. A combination of conceptual frameworks appears to be well suited to the intentions of the project – the STEM Ecosystem idea (p 14-15) underlies the idea of building partnerships for immersion and a design cycle for Project Based Learning (p 4-5) supports the development of integrated curriculum materials. The Logic Model (Appendix G) clearly orients activities of the project to their associated outputs and outcomes and depicts the intention of the strategies selected. Overall, the theory of action of the project – that a well-defined immersion experience for a whole school will positively impact high needs students – is well thought out and demonstrates potential to contribute to the literature on the effectiveness of the ecosystem approach for impacts at the school or district level. The proposal directly addresses continuous feedback and improvement (p 14-15) by describing both structures within the project that enable feedback and procedures for ensuring it. Of particular note is that the feedback plan specifically includes interactions directly associated with the teachers of students with special needs (p 16), a key component for a project with these particular goals.

Weaknesses:
The theory of action clarifies the broader interactions of the project, but the interactions of some components from a conceptual framework perspective are not addressed. For example, the proposal does not clarify in what ways or from what research perspective the social or network structures underlying the STEM ecosystem are addressed.

Reader's Score: 33

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:
METRICS presents a clear combination of Core Team, Advisory Council, school teams, and overall directors at the district level (p 16-17) who organize, facilitate, and direct the work of the project. This structure seems to address issues related to the overall work of the project but also the detail and interactions needed at the field level of implementation. The approach appears to be comprehensive and thorough. Roles appear to be well-defined, and most are provided with clear goals and time-related responsibilities in Table 3 (p 17-19). Key personnel have experiences in managing and evaluating significant grant projects, working with teachers, and leading initiatives (p 19-20). An additional project director and integration specialists will be selected, but the role descriptions for those appear to be well defined and integrated into the
management structure. Funding for the continuation of the project is described and documented (p 21, Appendix C, Appendix H), and the proposal describes that PLCs and other structures will be retained as a means to continue activities. A sustainability plan will be developed by Year 4 (p 21), allowing it to be informed by the successes and modifications of the created structures.

**Weaknesses:**

A significant concern for sustainability beyond the life of the project is the retention of the well-trained teachers produced through the immersion experience. The proposal doesn’t clearly address issues of attrition or provide a description of whether attrition of teachers is a general concern for the schools or district involved. However, the impacts of retention of teachers, a frequent issue in rural areas, are not addressed as impacts on the ongoing sustainability of the project and how new teachers will be integrated into the communities that are developed as a result of the project. Administrators are not clearly integrated into the activities of the immersion, but their role is vital to the sustainability of the project.

A concern of the long-term viability or replication of the project is the amount of commitment required of teachers in the project. It appears that many teachers are engaged in summer experiences, 60 hours of professional development, and coaching experiences (p 11) plus curriculum development and testing (p 11). The costs of compensating teachers for these activities could be prohibitive in replication.

**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:**

Targeted interventions that are well-suited to high needs students include the inclusion of travel funding for afterschool activities (Budget Narrative p 4) and quarterly showcases for underrepresented English Language Learners families (Budget Narrative p 7). Additionally, the teachers of English Language Learners are incorporated into feedback and improvement processes (p 16).

**Weaknesses:**

None noted.
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Technical Review Form

Panel #22 - EIR Early Phase Tier 1 - 25: 84.411C

Reader #1: **********
Applicant: Winchester School Board (U411C190012)

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 has comprehensively described the potential contribution of this application to increase knowledge and effectively described the problems in computer science education at the K12 level. For example, the applicant has recognized some persistent challenges in CS education such as the lack of CS standards, qualified teachers in CS, integration of CS with other STEM curricula, and motivation among students to continue for CS degrees, etc.

2. The applicant has described 3 well-conceived existing strategies that will be based on a whole school immersion approach. These three strategies are: (1) creating problem-based CS curriculum that will be integrated into STEM subjects; (2) providing teachers development to sustain the CS teaching; and (3) focusing on strengthening the student successes in the classroom by linking CS and other STEM subjects. The applicant has provided a strong description of these strategies such as development of the CS curriculum in a phased manner (building digital tools, STEM labs, PEDLE (personalized Education and Digital Learning Experiences), Partnering with CodeVA to train CS teachers and their professional development, and assessing the impact of the CS curriculum and goals by collaborating with industry and academic partners. Therefore, the applicant has presented strong strategies that will help in achieving the goal of this project.

Weaknesses:

1. None noted.

2. None noted.

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.

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

Strengths:

1. The applicant has listed 3 goals. These three goals are basically the three strategies presented in the significance section. Each goal has multiple objectives with an outcome that will be measured by different existing and validated instruments in the school system.
   •   Goal 1 will be fully implemented from year 2 and will engage students in the newly created CS problem-based curriculum. The applicant assumes that implementing the new curricula will lead to an increase in the rate of students who participate in CS and do well in CS. The applicant has provided baselines and projected success rates of students.
   •   Goal 2 focuses on developing quality teachers and sustaining the practices in CS. The applicant has proposed that 60% of teachers will receive 60 hours of professional development tailored towards CS teaching and at least 5 teachers from each school will take part in STEM professional experiences. The applicant will track these activities through different instruments such as attendance tracking logs, STEM participation logs, and quarterly coaching logs.
   •   Goal 3 focusing on assessing the successes of goal 1 and 2 by field trips attendance logs, innovation center logs, summer records, and CS kids and CS club attendance logs. It is anticipated that compared to year 1, at least 75-80% of students/teachers will participate in the proposed activities.

Therefore, the applicant has provided objectives that could be measured to assess the success of the project activities.

2. The applicant will implement the “METRICS” in two elementary schools. They have provided a conceptual diagram (figure 3) that is driven by teacher development, student interest obtained via surveys, relevance to national and global issues, and fits to state CS standards. This the conceptual framework integrates the three goals of this proposal that will inspire, motivate and engage students/teachers to increase the CS visibility in selected schools.

3. The applicant has provided 5 procedures to receive feedback and continuously enhance the activities based on the feedback. These procedures are the leadership team, plan to do study act, evaluation, logic model, and getting feedback from students with special needs. For continuous improvement of the proposed activities, these procedures are adequate and important.

Weaknesses:

1. How the 60 hours of professional development for teachers will be sustained is not clear.
2. None noted.
3. None noted.

Reader’s Score: 34

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. The management plan is adequate. The school superintendent will serve as an advisor and also provide the oversight to the project activities. There will be the program director and other required personnel. Their job description, and activities are well described. The milestones for each personnel are well described and included in the budget.

2. The applicant has described the required qualifications for each person in detail. Their qualifications seem appropriate and will help in achieving the goals of this proposal. For example, the PI has a Ph.D. degree in education and has prior experiences in managing successful large-scale federal awards including over $10 million in U.S. Department of Education’s Investing in Innovation and School Climate Transformation Grants.

3. The applicant plans to sustain the proposed activities beyond this proposal by signing MoUs with industry partners such as CodeVA, academic institutions, local museums, and STARBASE. Some of the MoUs are attached in the application. This demonstrates that they will sustain some of the activities beyond the project period.

Weaknesses:

1. None noted.

2. None noted.

3. The applicant has used standard methods to sustain the activities beyond the project period. It would have been effective to clearly layout some plan within the school district detailing the transition of the proposed activities beyond the two experimental schools. The lack of explanation about how they control the attrition rate of teachers and what is the plan for new teachers and their professional development could have been beneficial.

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 proposed METRICS proposal is designed to improve the student’s achievement and educational curriculum in computer science by engaging students in PBL and providing professional development to teachers. This project will be implemented in two K-4, Title I schools serving 914 high-need students with a free- and reduced-lunch rate of 83%.

Weaknesses:

None noted.

Reader's Score: 5

Status: Submitted
Last Updated: 06/14/2019 12:16 PM
## Technical Review Coversheet

**Applicant:** Winchester School Board (U411C190012)  
**Reader #3:** *******

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| Priority Questions                              |                 |               |
| **Competitive Preference Priority**             |                 |               |
| **Competitive Preference Priority**             |                 |               |
| 1. Absolute Priority 3                          | 5               | 5             |
| **Sub Total**                                   | 5               | 5             |
| **Total**                                       | 85              | 80            |
Technical Review Form

Panel #22 - EIR Early Phase Tier 1 - 25: 84.411C

Reader #3: ***********
Applicant: Winchester School Board (U411C190012)

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 presents evidence (ex: local CS jobs openings are in demand at a rate 4.1 higher than the average and a nonexistent rate of CS Teacher Candidate Graduates; Page e21) as justification to address CS at a local level through their whole school immersion program designed to build skills, competencies, and interest necessary to success in STEM/CS professions. The whole school immersion program offers solutions to these local problem with the intent to provide a repeatable and scalable model to the national community facing similar issues.

(2) Winchester School Board will implement a whole school immersion approach to Computer Science as a means of addressing six educational challenges (page e20). For example, state standards are in place, but teachers lack knowledge and resources to implement the standards, the whole school immersion uses three new strategies to address these challenges. The strategies offered provide clear solutions to identified challenges. The new strategy, Creating Rigorous CS Curriculum Units and Assessment, will address the barriers of teacher resources, CS integration across the curriculum, and provide student engagement opportunities to boost interest. The applicant has provided the development and demonstration of these promising three new strategies that if successful have the potential to be a national model for whole school immersion of CS/STEM.

(3) The applicant identifies the educational problem of introducing Computer Science too late, and promises new strategies and frameworks to address the problem. Specifically, the proposal includes the development of a unique elementary school continuum (Page e20). The elementary school continuum will incorporate new strategies including the use of a core team of K-4 teachers and staff to “examine and design” an integration plan for CS within the elementary setting. The significance of the proposals is strengthened through the comprehensive approach to solving educational problems by addressing the entire culture of the elementary school though the incorporation of digital tools across the curriculum, performance-based assessments (Page e23), and content planning that is teacher driven and student focused. These strategies provide solutions to the problems faced by many elementary schools while maintaining the focus of underrepresented minorities.

Weaknesses:

(1) The proposal provides three new strategies to implementing whole school inclusion of Computer Science within the elementary schools; however, the application fails to connect proposed program activities and competitions with established programs. The sustainability of the project is questioned in regards to the time required for schools to implement the new strategies and effect whole school change as a result of those changes.
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 application provides a breakdown of each goal into several comprehensive objectives. The specificity of the objectives and outcomes increase the possibility for replication and scalability of the program in other settings. Baseline equivalent will be determined through a variety of resources, such as standardized tests, classroom observation and survey results based on research based rubrics (page e31).

(2) The applicant uses a framework consisting of three core components illustrated as connected gears. The framework and the imagery emphasize the interconnectedness of their program. The applicant correlates the current education system functioning in compartmentalized departments to farm silos and uses their framework to unify three separate “silos” (Teacher Development, CS/STEM, Students Real-World Tethers) to achieve the defined project goals (page e31). The framework successfully integrates three individually successful core concepts together to develop their hypothesis that “the creation of an elementary school continuum will have a positive impact on improving achievement and attainment” (Page e32). The framework narrative further includes evidence of research to support the inclusion of each core framework selected. The comprehensive and evidence based support included strengthen the quality of the project framework.

(3) The applicant provides a plan for continuous reflection and improvement. The project designed a management team, advisory council, and school teams and incorporated their involvement in feedback and continuous improvement loops tasked to gather feedback, share best practices, and address implementation issues. The applicant provides a meeting schedule, detailing quarterly, monthly, and weekly review meetings. Additionally, the applicant references an existing successful monitoring system (Plan-Do-Study-Act) to incorporate within the operations of the proposed project (page e34) to monitor the implementations of the proposed strategies.

Weaknesses:

(1) Target student academic outcomes are included in some objectives, but not all objectives are specific. Additionally, measurements for the goals and targets are minimally included, or show an inconsistent measurement of success. For example, student success is targeted at only a 5% increase, but participation targets are set for 75-90% (Page e30). Additionally, objectives frequently use measurements indicating the completion of the objective rather than a measurement indicative of the quality of success, such as attendance logs and records of participation. Neglecting to include a consistent parameter to measure student achievement fails to validate the success of the new strategies.

(2) The outcomes for interest via surveys collected are strong, but not all are objective measurements and indicate a criterion for success. For example, data collection methods for CS/STEM Coursework via real world linkages fail to include pre and post test data. The current method of “field trip attendance log” and “Participation Record” (Page e31) limits the analysis of the data, furthermore student knowledge, satisfaction, or preference is not provided with attendance results.

(3) While the proposal includes teacher voice at all layers of implementation, the proposal required a significant amount of additional hours from involved teachers in the form of professional development, after school, and summer experiences. The extensive involvement from teachers is a weakness that would impede sustainability of the project as
well as replication in other schools.

Reader's Score: 33

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) The management plan is detailed and aligns with goals and objectives presented in the project design. The proposed management plan includes a clear delineation of responsibilities and explicit timelines of project tasks that will ensure the project is on time and accurately implemented.

(2) The management plan is comprehensive and the applicant includes all the requirements on the credentialed staff and their responsibilities for implementing the project. For example, the established Project Advisor has a diverse and successful background with demonstrated experience and training (page e36). Additional personnel positions and descriptions provide a well thought out plan for how staffing will be used, selected project support personnel are experienced in their field as it applies to the project goals. New project support staff to be hired in conjunction with the execution of the project are clearly identified with relevant background experience requirements identified.

(3) The applicant identifies the existing support of districts, administrators, teachers, and community partners from “existing STEM reform initiatives” (Page e39) as evidence of their commitment to computer science and STEM initiatives and therefore the project (page e39). The proposal strengthens their commitment to maintaining sustainability through the integration of an EIR Advisory Council from year 1-4 that will culminate with a sustainability proposal in year 4, “this plan will address existing capacity using evaluation results to clarify programmatic elements that should be preserved with an emphasis on leveraging district and community resources” (Page e40). Additionally, the applicant includes letters of support from community members highlighting their financial support approximately $161,000 and specific contributions, such as field trips and activity materials (Page e69, e81). These existing supporters imply the existence of future support after Federal Funding ends.

Weaknesses:

(1) The sustainability of the project beyond the grant funding term is a concern. The application does not address teacher retention and attrition, however the project requires a significant amount additional hours from teachers. It would strengthen to proposal to include a proactive plan to address new teacher training and existing teacher retention. Additionally, the proposal does not address potential challenges this program will face regarding student attrition. For example, there is no plan to address data related to students who move out or in mid-year. The interrelated design of the whole school immersion plan necessitates trained teachers for execution of the program; not addressing these future issues is problematic. Another opportunity to increase sustainability would be providing opportunities to connect proposed program activities and competitions with established programs. Connecting new with existing opportunities would provide opportunities for schools to maintain successful program and save time while implementing several new strategies within their building.
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:

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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) The applicant proposal expands computer science to identified underrepresented students. Applicant identifies potential barriers and provides solutions related to the execution of the project. For example, the project identifies the potential barrier of providing services for students who are not native speakers. The applications provides a proactive plan to address these students through coordination between the two schools, the Project Director, Management Team, and ESOL Coordinator to ensure that translators are present. Additional proactive solutions include differentiation of curriculum materials designed for varying educational levels and an implementation of a multi-tiered system of support to address achievement gaps related to disproportionate gaps as a result of high poverty (Page e12-13).

(2) Targeted populations are defined and supported by data confirming their identification as underrepresented and low income students (page e17).

Weaknesses:

(1) There are no weaknesses related to the selection criteria.

Reader’s Score: 5

Status: Submitted
Last Updated: 06/14/2019 05:33 PM