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

Status: Submitted
Last Updated: 08/08/2018 03:20 PM

Technical Review Coversheet

Applicant: Sonoma State University (U411C180146)
Reader #1: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		30	25
Quality of the Project Design and Management Plan			
1. Project Design/Management		50	43
	Total	80	68

Technical Review Form

Panel #17 - EIR Early Phase Tier 1 (Content) - 17: 84.411C

Reader #1: **********

Applicant: Sonoma State University (U411C180146)

Questions

Selection Criteria - Significance

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

(1) The national significance of the proposed project.

(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.

(3) The extent to which the proposed project demonstrates a rationale (as defined in the NIA).

(4) The extent to which the proposed project represents an exceptional approach to the priority or priorities established for the competition.

Strengths:

- (1) The narrative highlights the importance of STEM education within a national context. It portrays the role that the proposed project may play in meeting the national need about STEM education. In this particular case, a creative way to teach and expand computer science curriculum with a career and college path, professional development, industry strategic partnerships, and individualized learning. The proposed program has been already piloted and has a success track record. It serves high need student populations. Several citations and data were provided to corroborate the validity of the narrative and to contextualize the national importance of the project. If effectively implemented, the project may have a national impact by creating a career path incorporating computer science.
- (2) The proposed strategies and plans are provided with a variety of details and build on an existing computer science curriculum model focused a career and college path. The curriculum and instruction components are substantially described. Student engagement and learning is an important component of the project (pg. e33). The data collection system is mostly self-sustainable (pg. e30). The curriculum has a career and college readiness approach allowing students to be employable at the end of the program through internships (pg. e31). There are curriculum adjustments based on a continuous improvement approach (pg. e30). The mentioned strategic partners have letters of support in the appendix.
- (3) The narrative addressed the generalities of the project rationale as defined in the NIA. It provides considerable data to support the claims of the project (pg. e32). The narrative based a potential success rate based on former data. It highlights a career and college readiness path for students. The absolute priorities are addressed. Student engagement is a priority in the proposed project (pg. e33). Teachers' input for continuous improvement is considered (pg. e33).
- (4) The narrative addresses how the project meets the absolute priorities by establishing partnerships between schools and providing students access to work-based learning experiences in STEM fields. In this particular case, a career path incorporating computer science. The narrative also elaborates on the curriculum extensively. For example, it addresses the lack of qualified personnel within rural communities and the implementation of virtual learning communities to compensate that deficiency.

Weaknesses:

- (2) The professional learning communities are a missing link between the program and the realities of a high school and a school district. Without the buy-in from teachers and campus administrators, the program may not be effectively implemented. Also, the proposed project implies changing some of the traditional approach from a high school and its career and technology program. Teachers will be exposed to a considerable amount of professional development

hours. Without professional learning communities playing a critical role in the equation, it is hard to see the program being effectively executed.

- (4) The professional learning community concept could have been further expanded by including school administrators, as well as the buy-in process to incorporate the program into a high school dynamic.

This criterion was thoroughly discussed and my score reflects my professional assessment of this section.

Reader's Score: 25

Selection Criteria - Quality of the Project Design and Management Plan

1. **In determining the quality of the proposed project design, 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 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.

(3) The extent to which performance feedback and continuous improvement are integral to the design of the proposed project.

(4) The mechanisms the applicant will use to broadly disseminate information on its project so as to support further development or replication.

Strengths:

- (1) Goals and objectives are clearly stated. The measurement tools are clearly specified: student achievement data, high school credits, career path, and participation rates. The proposed projected provided a detailed logic model in the appendix. Good adjustment and progression of professional developments throughout specific timeframe. Some details are provided in regards to how the professional learning communities may be implemented on a monthly basis. Also, the plan provides some details in terms of the lesson planning process (pg. e38).
- (2) The provided details of the management plan were comprehensive with key personnel, responsibility, and timelines. The project progression was clearly explained (Figure 2). The specifics about the personnel and consequential dynamics were clearly explained.
- (3) The narrative provides a variety of details in regards to assessments and constant improvement through data collection at different venues. Some of the key personnel in the project have a proven record implementing the program in school districts and high schools (pg. e43). Some details are provided in regards to online professional developments, which may be essential in rural communities. The infrastructure aspect (high bandwidth for internet) and budgetary consequences are addressed with specific examples (pg. e45).
- (4) Good details on how to disseminate and replicate the project. Potential presentations at different venues together with the expansion of current strategic partnerships seem to have a good platform to contribute with the project dissemination (pg. e46). Partnerships and letters of support are included in the appendix.

Weaknesses:

- (1) The data collection and measurement tools does not include national assessments such as AP exams, SAT, PSAT, and ACT. Ultimately, the way to prove that the proposed program has a significant impact on STEM education is by measuring it with national data. Also, it is not clear if the students will end up gaining dual credits with neighbor community colleges. That could serve also as a measurement tool if wanting to prove national significance.
- (2) The professional learning communities continue being a missing link between the program and the realities of a high school and a school district. Without the buy-in from teachers and campus administrators, the program may not be effectively implemented.

- (3) The narratives do not fully address how the program will be effectively implemented within a school district context. For example, the proposed project implies changing some of the traditional approach from a high school and its career and technology program. Teachers will be exposed to a considerable amount of professional development hours. Without professional learning communities playing a critical role in the equation, it is hard to see the program being effectively executed.

- This criterion was thoroughly discussed and my score reflects my professional assessment of this section.

Reader's Score: **43**

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Last Updated: 08/09/2018 04:35 PM

Technical Review Coversheet

Applicant: Sonoma State University (U411C180146)
Reader #2: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		30	30
Quality of the Project Design and Management Plan			
1. Project Design/Management		50	50
	Total	80	80

Technical Review Form

Panel #17 - EIR Early Phase Tier 1 (Content) - 17: 84.411C

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

Applicant: Sonoma State University (U411C180146)

Questions

Selection Criteria - Significance

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

   (1) The national significance of the proposed project.

   (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.

   (3) The extent to which the proposed project demonstrates a rationale (as defined in the NIA).

   (4) The extent to which the proposed project represents an exceptional approach to the priority or priorities established for the competition.

Strengths:

The application provided clear details to show national significance by stating that Learning by Making (LbyM) is an innovation that will increase their nation's economic competitiveness by creating, improving and expanding STEM learning and engagement in rural America. (1 –e27 to e28)
The application provided adequate data to show the significance of the project by stating that in the U.S., 53% of all school districts are rural, and a third of all students attend rural schools (Johnson, Showalter, Klein & Lester, 2014). In addition, the application also provided clear data
to show that LbyM will implement solutions to "rural brain drain" (Fishman, 2015) through its emphasis on CTE partnerships and increasing technology competencies of teachers. (1 – e28)
The application adequately shows that the proposal involves the demonstration of promising new strategies by stating that building on the results of the LbyM pilot test in eight rural classrooms, the proposed project aims to further develop the innovation through an iterative process of continuous improvement to improve learning outcomes for a larger population of rural high-need students. (2 – e29 to e30)
The application provides adequate details to promising new strategies by stating that building on their previous i3 work, they will expand their work with individual school districts to create a STEM pathways curriculum that integrates computer science competencies within CTE programs. (2 – e30)
The application provides details to show their rationale by stating that during the 2016-17 academic year, WestEd conducted a rigorous, high-quality study of the i3-funded LbyM pilot (LbyM-p) STEM curriculum on the impact of the curriculum in increasing rural high school students' mathematics and science outcomes and enhancing their teachers' instructional practices and technological competency. To show a clear rationale the application states that the results of this study provides the rationale that their planned intervention is likely to improve student outcomes. (3 – e32 to e33)
The application provides details to clearly show that the proposed project has an exceptional approach by stating that LbyM Approach to Invitational Priority 1 which relates to Personalized Learning and is needed because in rural classrooms there is a mixture of student abilities within a single class as schools are often too small to offer separate AP courses (Goodpaster, Adedokun, and Weaver, 2012). The application states that by offering a series of challenges as part of each unit, as well as Going Further exercises, LbyM supports a wide range of abilities within a single classroom. (4 – e35)

Weaknesses:

No weaknesses noted.

Reader's Score: 30

Selection Criteria - Quality of the Project Design and Management Plan

1. **In determining the quality of the proposed project design, 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 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.

(3) The extent to which performance feedback and continuous improvement are integral to the design of the proposed project.

(4) The mechanisms the applicant will use to broadly disseminate information on its project so as to support further development or replication.

Strengths:

The application provides adequate details to show their goals, objectives and outcomes are clearly measurable by stating their goal of expanding local partnerships to develop STEM and computer science pathways that provide access to work-based learning experiences. The application also provided clear objectives and outcomes to address their goals. For example, the application stated the goal of In Years 1-5, 80% of students will be able to identify the courses needed to prepare for college readiness in a STEM major. (1 – e36)
The applicant provide clear details to show expected outcome measures for each goal by stating the they will use district pathway documents, annual survey, and attendance logs to measure project goals and objectives. (1 – e37)
The application provides clearly defined responsibilities such as the Project Director providing project leadership and fiscal and USED requirements along with dissemination of activities and overseeing the PDSA process. (2 – e39 to e40)
The application clearly shows a table with timelines and milestones. For example, the application stated that in June 2019 and annually the project will have a 5-day teacher summer institutes at SSU for Phase 1 teachers. (2 – e40)
The application provided clear details to show continuous improvement by providing a . In addition, the applicant discussed that the LbyM Leadership Team will consider each specific problem that they are trying to solve, and develop an initial strategy to address the problem while ensuring that they collect sufficient data to determine the effectiveness of the strategy as implemented. (3 – e40 to e41)
To further provide clear details about performance feedback and continuous improvement the application provides details to show that the LbyM Leadership and WestEd Evaluation teams will review the results of applying the strategy to the problem, and determine further modifications needed to address the problem. If the results of this PDSA cycle are not in accordance with their initial predictions, they will repeat the cycle to ensure continuous improvement. (3 – e41)
The application provides clear details to show their plans to disseminate project information by stating WestEd will present evaluation results from the LbyM formative research studies and impact study at a variety of annual conferences, including the California Educational Research Association. In addition, the application stated that WestEd will target the International Journal of Innovation and Research in Educational Sciences and the International Journal of STEM.

This criterion was thoroughly discussed and my score reflects my professional assessment of this section.

Weaknesses:

No weaknesses noted.

Reader's Score: **50**

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Technical Review Coversheet

Applicant: Sonoma State University (U411C180146)
Reader #3: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		30	26
Quality of the Project Design and Management Plan			
1. Project Design/Management		50	46
	Total	80	72

Technical Review Form

Panel #17 - EIR Early Phase Tier 1 (Content) - 17: 84.411C

Reader #3: **********

Applicant: Sonoma State University (U411C180146)

Questions

Selection Criteria - Significance

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

(1) The national significance of the proposed project.

(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.

(3) The extent to which the proposed project demonstrates a rationale (as defined in the NIA).

(4) The extent to which the proposed project represents an exceptional approach to the priority or priorities established for the competition.

Strengths:

1) The national significance addresses a local and national problem, which is economic competitiveness in the field of STEM, specifically science, math and computer science. The project does a good job of identifying the need to increase in number and quality the area of STEM workers. Evidence shows that US students ranked 19th in science and 30th in math among 35 industrially developed countries (p. 2). Also, of national significance is the impact on high-need students of rural areas that will be exposed to new STEM-based computer science pathways and work-based learning that will be made possible through industry partnerships.

Positive components include
-Alignment with CTE pathways, which will support college and career readiness.

2) The project is building on the success of a previously completed USED i3 Development grant. This project's plan was developed around the data revealed in the previous grant's evaluation. Additionally, the project used data and knowledge from an additional project, TEEMS.

Creation of new partnerships support and expand current CTE programs
Restructured professional development that will train teachers how to support students in work-based learning experiences

The project will have the ability to support the (already developed) Career and Technical Education (CTE) pathways that will be supported and enhanced through work-based learning experiences.

Students will obtain skills in computer science, electronics, and problem solving- all of this supports the nation's need of competitiveness. Additionally, they will support "regional economic development strategies and through work-based learning allow students to take advantage of the community's natural resources.

3) The project's rationale based on the positive impact from the previous grant allow the plan to utilize the knowledge of current strategies which can positively impact "socioeconomically disadvantaged" students in rural areas. The rationale does a thorough job of connecting the teachers' need for improved knowledge of computer science (in other content areas), work-based learning experiences and college/career readiness skills in students.

4) This proposal is exceptional because it meets absolute priority area 3 by engaging in LbyM programming and field-

based learning experiences that allow students to build knowledge in the area of computer science. This will be implemented with a quality, established and well known program, Logo, to support teachers' professional learning with computer science and students access to new STEM learning.

Additionally, the use of Logo as an established, user-friendly program supports the needs of rural area teachers that cannot easily access professional development.

Weaknesses:

1) No weakness in this area.

2) No weakness in this area.

3) Professional development being restructured is an automatic response to the geographic challenges of the rural areas. However, teachers may benefit from building professional learning networks with others of the same cohort and PD providers (project team).

4) Teacher professional development must be prioritized and the project plans to utilize distance-learning technology due to the geographic challenges. This could be used as a secondary form of professional development or as a follow up to the face-to-face delivery. It is essential that teachers gain a strong foundation within the LbyM curriculum in order to best support students.

Reader's Score: 26

Selection Criteria - Quality of the Project Design and Management Plan

1. **In determining the quality of the proposed project design, 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 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.

(3) The extent to which performance feedback and continuous improvement are integral to the design of the proposed project.

(4) The mechanisms the applicant will use to broadly disseminate information on its project so as to support further development or replication.

Strengths:

1) The project's goals, objectives and outcomes are detailed nicely and include the parallel alignment to local business/organization partnerships, professional development and the expansion of LbyM curriculum.

2) The timeline and milestones clearly shows Phase I will include schools already implementing LbyM curriculum. Phase 2 includes the selection of new schools, and the plan clearly shows how the schools will be selected by using criteria which includes rural, high need schools that are able to provide the requested match and are ready to implement.

3) The PlanDoStudyAct (PDSA) framework will be followed throughout to ensure consistent improvement by collecting and analyzing data around the practices being implemented. The project team will utilize the PDSA framework coupled with the formal evaluation tools. As the project grows the team will utilize experiences made possible through partnerships for "marketing" the learning and sharing out the message around STEM careers that align with skills taught in the

programming.

4) Dissemination for the project will be completed by sharing at local and national conferences. The SSU team will format these presentations through hands-on activities, which will allow new learners to engage with the programming. The WestEd evaluation team will share the evaluation results with the What Works Clearinghouse.

Weaknesses:

1) No weaknesses in this area.

2) In Phase 2 it is noted that schools will be selected using a set of criteria. Two of the criteria included the ability to provide the match and readiness for implementation of LbyM. Nothing was mentioned about how the readiness would be measured. Nothing was mentioned about how much of the criteria would be required to be selected. Lastly, there was no mention of ability to include a school even if the match was unavailable by the school(s), but other areas of criteria were met. The letters of support are provided to compensate $5,000 per year for their commitment; however, funding may always be cut as education funds may change from year to year. It is not unrealistic to believe that a financial match may not always be a viable option for possible schools. Financial commitments are also impacted by time of the school year as well.

3) The project addresses teachers during Year 1 and 2 will receive 80 hours of annual professional development and this will be measured by an annual teacher survey. The implementation of teacher surveys administered after each major PD session may lend itself to more continuous improvement. Goal 2- Objective 2.2

The project Goal 2- Objective 2.3 states that “at least 40 hours of PD will be formatively evaluated by West Ed.” The project will be providing 80 hours, therefore, only half of the PD will be formatively evaluated. The ability to have an external evaluation ensures ongoing assessment and ability to pause and make mid-course corrections that may be needed to best meet the needs of the participants. This can also be seen in Objective 2.5

4) No weaknesses in this area.

Reader's Score: **46**

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