

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

Status: Submitted

Last Updated: 06/07/2019 11:45 AM

Technical Review Coversheet

Applicant: Tufts University (U411C190006)

Reader #1: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	25
Quality of Project Design		
1. Project Design	35	35
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	20
	Sub Total	80
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	5
	Sub Total	5
	Total	85

Technical Review Form

Panel #11 - EIR Early Phase Tier 1 - 11: 84.411C

Reader #1: *****

Applicant: Tufts University (U411C190006)

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:

Through involvement with 32 elementary schools in the Norfolk Public School district, which is one of the lowest performing districts in Virginia, the project will serve high need students, increase content knowledge, and provide strategies for the introduction of computer science strategies to under performing students (p. e22). Addressing technical content in the lower grades requires insight and vision, since there is no guarantee that the student body is prepared to begin new and innovative instructional techniques. By increasing content knowledge at the onset, there is a greater opportunity for students to engage in rigorous instruction that is new and refreshing. The applicant describes the project's manner of introduction of computer science in early education as an addition to the foundational content areas of math and literacy. Students learning to code through the project builds on computational thinking through new and existing activities such as: Scratch, Scratch Jr. &, and LOGO (p. e26). The students may find that some of the coding principles that learn are similar to some of the technology they use at home on the computer or smart phone.

Weaknesses:

NA

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:

The application provides a comprehensive table which specifies 3 goals, complete with objectives, and outcomes with associated measures that are relevant to computer science (p. e29). The application presents more complete information about instruments and measurement in Appendix I (p. e114-116). The surveys and other quantitative measures that were proposed are very good instruments to use when seeking to make a case for an effective intervention, there is strength in numbers when funding is dependent upon tangible results. The outcomes that the project proposes to achieve are specific to curriculum alignment, implementation, and leadership capacity building (p. e29-30).

The application contains a comprehensive logic model in Appendix G (p. e111), which details what teachers need to improve student learning. The conceptual Framework provided is relative to the curriculum and professional development needed to integrate the computer science curriculum into this K-2 environment (p. e31). Appendix G provides resources, activities, outputs, and short-mid-and long-term outcomes for the 4-year project period (p. e111). A critical outcome of this conceptual framework is training and recruiting teachers to work with the Tech leaders. The importance lies in the fact that there is a need for technical professionals in all fields, by having teachers and tech leadership cooperating, there is a learning community that is being developed that will sustain the project and the curriculum.

Curriculum and professional development will be undertaken in phases to integrate research and practice, through the use attention to feedback and continuous improvement. The proposed curriculum will be drafted based on prior work by DevTech, the draft curriculum will be reviewed and refined, and a subsequent program guide will be developed (p. e33).

The curriculum will be piloted, and the results assessed. Continuous improvement will be addressed through training from the leadership group (p. e34).

Weaknesses:

NA

Reader's Score: 35

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 application noted a comprehensive management plan which involves collaboration between the DevTech research group, the Norfolk Public Schools (NPS) team, and the external evaluation team (p. e35). With three organizations combining their time and talents, there is a collaborative benefit from the different perspectives involved. The development of a professional learning community is dependent upon stakeholders bringing their individual talents to the table and having a common vision, which is apparent in this project. The working relationship between these three entities will allow the project to be carried out on time and within budget. Table 2 is provided in the application to detail the timelines and milestones for the objectives, along with responsible groups and tasks (p. e 36-37).

The application provided the qualifications, training, and experience of 3 key personnel; one leader for each group: Professor Bers, of the DevTech research group; Angela de Mik of the NPS team; and Patricia Moore Shaffer of the external evaluation team (p. e37-38).

The application outlined how support would be sustained through the free provision of Scratch Jr., the curriculum, and

professional development materials. All in the school district would have access to these resources as well as support from the Scratch Foundation (p. e40). The project having resources available to students and parents free of charge is a benefit to the extension of learning from the students to their families.

Weaknesses:

NA

Reader's Score: 20

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 presents a proposal that addresses Absolute Priority 3 through the development of a computer science curriculum for the target population of high need students in need of support. The project will also improve student learning and teacher knowledge related outcomes through this rigorous curriculum (p. e17). Resulting from the project will be an integrated K-2 computer science curriculum, and teaching materials used along with professional development to sustain the work and scale to other states (p. e19).

Weaknesses:

NA

Reader's Score: 5

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Technical Review Coversheet

Applicant: Tufts University (U411C190006)

Reader #2: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	23
Quality of Project Design		
1. Project Design	35	29
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	19
Sub Total	80	71
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	5
Sub Total	5	5
Total	85	76

Technical Review Form

Panel #11 - EIR Early Phase Tier 1 - 11: 84.411C

Reader #2: *****

Applicant: Tufts University (U411C190006)

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 appropriately addressed how their project will increase knowledge or understand educational problems, issues or effective strategies. For example, proposed strategies are suitable for replication (increasing knowledge) in other settings. Their dissemination procedures address Professional Development that entails: forming and training Tech Leaders; providing feedback and modification during curriculum development and pilot testing; participating in an online ECT graduate program; implementing procedures in school programs; and documenting dissemination of best practices through Scratch Jr Sharing resources website under DevTech management. Evaluation and programming process are defined, appropriate, effective, and provide guidance for quality assurance. e34 ,e28,e33, e32

2.The applicant has shown the effectiveness of their project. They have proposed interventions that will address the problem and demonstrated how their proposed program (based on best available evidence) could build on previous existing strategies developed by ScratchJr founders. For example, to demonstrate the success of their model, the applicant focuses on a new literacy integration curriculum in early childhood. The project will be developing and field testing in 2 new schools, and implementing the project in 15 schools to determine if there is an effective outcome in knowledge and learning. To enhance their program, they will manage district/partner relationships; oversee data collection and tracking processes; and collaborate with schools and teacher leadership. e28, e12, e36

Weaknesses:

1.None Noted

2.The applicant has not clearly described existing curricula, programs or courses offered within their target schools. This is needed to provide an overall depiction of how their strategies will enhance or scale current initiative. It is impossible to assess if ScratchJr and its initiatives are new or alternatives to existing plans or duplicative services. e28, e12, e36

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 applicant has identified goals and objectives for their project. For example, summative outcomes (intended changes) and activities correlate with the goal of their program and address project implementation. Objective performance measures relate to the intended outcomes (changes) of the project, and will produce quantitative and qualitative data from observations, focus groups, interviews. e29

2.The applicant has presented a conceptual framework that identifies key components of the project and addresses quality activities for that framework. For example, they have detailed a plan that demonstrates evidence-based activities (outputs) and provided an appropriate rationale regarding services that will be offered within their program. For example, in order to demonstrate how research supports the design of their project and how it will be incorporated into their program, they have noted the effectiveness of their guided strategy; and have cited studies such as (Kafai, Y. (2006). Playing and Making Games for Learning: Instructional and Constructionist Perspectives for Game Studies. Games and Culture,1(1), 36-40) that explain that there is the likelihood that K-2 student achievement increases in computer science, literacy and math with consistent replication in each group. e111, e333

3.The applicant has provided a clear depiction of how continuous feedback and improvement methods are integral to the design of the proposed project. For example, curriculum development, pilot training, and planning will be utilized throughout their program. Their continuous improvement methods include documentations of interval performance measures that could serve as assessment milestones. Intervals such as, Spring 2020 and biannual assessments have been discussed and include plans to modify the program as needed. The DevTech, NPS teams and the external evaluator will collect, analyze, review quantitative and qualitative data, and supervise the data process. e39, e42, e36, e33

Weaknesses:

1.The applicant has not demonstrated that goals will realistically be met in a timely manner. Measurable goals or objectives that can be used to gauge the progress of the project have not been provided. For example, quantifiable targets that correlate with goals such as, " Build capacity leaders, technology coordinators and coaches to replicate the work in group 2 and sustain work following grant period" have not been established. Therefore, it is difficult to determine if the applicant's goals are realistic and if proposed outcomes are fashioned to effectively result in the successfully accomplishment of the stated objective. e29

2.None Noted

3.None Noted

Reader's Score: 29

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 applicant has provided the necessary information to effectively assess the efficiency of their management plan. For example, information regarding timelines and how milestone activities will be accomplished and supported in order to achieve outputs; specific committed staff responsibilities; and descriptions of their roles are indicated. Key personnel includes: (Principal Investigator) who will provide directions for research project, coordinate and supervise staff; (Project Manager) who will be responsible for coordinating on-line resources; (Project Coordinator) (TBN) who will serve as the Tufts liaison to the Norfolk Public Schools; (External Evaluator) and Project Director who will oversee the program and has administrative skills to provide information to key administrators in order to fulfill proposed objectives and effectively implement the proposed project. The implementation, evaluation plan, and strategies to achieve the objectives within budget on time are documented. e339

2.The applicant proposes key personnel to ensure that there will be proper oversight of key programmatic operations during implementation stages of the project. For example, detailed appropriate professional qualifications, experience, and administrative skills to effectively fulfill the objectives of the project are explained. For example, Project Director: (PhD) (Stanford School of Education; computational thinking, youth coding, and childhood technology experience); ScratchJr Project Manager: (methodology expertise and doctoral student); Project Coordinator: (background in CS education, curriculum and instruction.); and Project Manager:(primary liaison with NPS and the evaluation team) will be hired. Qualifications of the key personnel are appropriate to the respective positions. e38

3.The applicant noted that the proposed program (ScratchJr) is a free service and available to the public as well as all school districts. The Scratch Foundation has supported the use of the project since 2014 and will continue to be supported by the Foundation. e26

Weaknesses:

1.None Noted

2.The applicant does not provide qualifications, experience requirements, or a contingency plan for unhired personnel. It is unclear if all personnel will be in place, and will be qualified and trained by the beginning of the grant period. e38

3.None Noted

Reader's Score: 19

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 addresses field-initiated innovations with a focus on Computer Science for grades K-2. The project is designed to involve 7,505 students and 450 educators in the at-risk districts in Virginia in high minority schools with more than 70% of the students economically disadvantaged and have low graduation rates. Programs/strategies are designed to improve the low-performing schools with a concentration of high need students by implementing differentiated instruction, assessments, technology, and curriculum adjustment to prepare students for the necessary skills to succeed the 21st Century Global Learning. e 40

Weaknesses:

None Noted

Reader's Score: 5

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Technical Review Coversheet

Applicant: Tufts University (U411C190006)

Reader #3: *****

	Points Possible	Points Scored
Questions		
Selection Criteria		
Significance		
1. Significance	25	20
Quality of Project Design		
1. Project Design	35	30
Adequacy of Resources/Quality of Management Plan		
1. Resources/Management Plan	20	18
Sub Total	80	68
Priority Questions		
Competitive Preference Priority		
Competitive Preference Priority		
1. Absolute Priority 3	5	5
Sub Total	5	5
Total	85	73

Technical Review Form

Panel #11 - EIR Early Phase Tier 1 - 11: 84.411C

Reader #3: *****

Applicant: Tufts University (U411C190006)

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 identifies two specific needs (e21) – (1) the need for developmentally appropriate (CS/CT) curriculum for K-2 and (2) the need for rigorous research-based professional development models for K-2

The project builds on earlier work targeting military dependent students' (e22) and seeks to extend that work to Norfolk's high-need K-2 student body. Project may be demonstration of a promising new strategy.

ScratchJr, as a programming language for K-2 students, is an appropriate component of a larger strategy (e26) and a (pilot) research study shows it supported literacy practices (e27).

Weaknesses:

The applicant does not situate this curriculum (or differentiate it) from other available K-2 curriculums that would clarify its potential contribution to increased knowledge or the ways in which it would lead to a better understanding of the problem.

The applicant indicates that there is a need for 'rigorous research-based professional development models for K-2' (e21, e27) but does not speak to any available research on PD models that would illuminate the gap that this research seeks to fill. (e21)

Although providing scalable strategies for introducing CS in high-need schools (e22) is important, curriculum is required for introducing CS in schools and therefore would not be a promising new strategy. There are no-cost K-2 CS curriculum readily available that contain plugged and unplugged activities. It is not clear how what is proposed here is different. It is not stated that other curricula are not developmentally appropriate or in some other way deficient. the promising new (innovative) strategy that would address the stated need for rigorous research-based professional development models for K-2 is not clear. (e27)

A curriculum that uses ScratchJr, a developmentally appropriate programming language, is not necessarily developmentally appropriate. The applicant does not detail the creation of developmentally appropriate unplugged activities as part of the curriculum. (e27)

Reader's Score: 20

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:

Goals - (1) develop integrated CS curriculum for K-2, (2) 'achieve high-fidelity implementation' that improves student outcomes and teacher knowledge and (3) build capacity of leaders to replicate and sustain work - are clearly specified (e29, e30). This is a strength because these goals address the critical elements for improving instruction. Additionally, multiple objectives for each goal are specified. It is clear that the curriculum will be aligned to standards. (e29). Standards aligned curricula is a key lever for equitable access to rigorous content.

A conceptual framework for curriculum, including associated curricular principles, is detailed (e30)

A framework for professional development – including full day seminars and tiered-coaching – is detailed (e32)

A process for revising the initial draft of the curriculum is stated.

Data collected via classroom visits will inform curricular revisions. (e33, e34)

A process for obtaining feedback to revise and improve professional development is discussed. (e34)

Weaknesses:

Some objectives lack clarity; It is not clear to which set(s) of standards the curriculum will be aligned (e29)

Professional development is not sufficient to ensure implementation fidelity It is also not clear what 'high-fidelity' implementation means or how the extent of fidelity will be measured (e29). This is a weakness because fidelity of implementation must be determined through regular classroom visits.

Reader's Score: 30

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:

Application specifies appropriate district level staff and identified relevant responsibilities for curriculum development and professional learning.(e38)

Activities/milestones aligned to goal 1 are comprehensive and likely to achieve the objectives of the proposed project. (e36-37)

Activities/milestones aligned to goal 3 are comprehensive and likely to achieve the objectives of the proposed project. (e36-37)

Key personnel have stellar qualifications relative to compute science research; The principal investigator has significant grant management experience, including NSF grants. (e37)

The curriculum developed would be available online at no cost. This is a strength because there should be no barriers to its continued use and because it builds internal capacity of the school district to continue the work. (e40)

Weaknesses:

Activities for goal 2 (e.g. 'implementation of curriculum', 'professional development group 1') are broad and not clearly defined. Because the activities are broad with multiple persons responsible, it is not clear who is responsible for completion milestones for accomplishing specific project tasks. (e36-37)

The potential for continued support for professional learning seminars and tiered coaching is minimal. There may be a need to update the curriculum as updates to ScratchJr become available. It is not clear who would provide continued support for curriculum and any requisite revisions should they become necessary. (e40)

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:

The applicant provides research that evidences the potential for studying CS to improve sequencing ability (e25) and the popularity of programming initiatives/CS education (e24). The applicant also provides data on the popularity of ScratchJr (e26) and the research basis for programming with LOGO in early learning spaces (e25).

Applicant makes the case for computer science as a (national) priority, and CS as a priority beginning in Kindergarten. A stated goal is implementation that improves student outcomes and teacher knowledge of computer science.

Weaknesses:

None

Reader's Score: 5

Status: Submitted

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