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

Status: Submitted
Last Updated: 07/18/2019 11:43 AM

Technical Review Coversheet

Applicant: National Math and Science Initiative (U411C190037)
Reader #1: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Quality of the Project Evaluation			
1. Project Evaluation		20	15
	Sub Total	20	15
	Total	20	15

Technical Review Form

Panel #3 - EIR Early Phase Tier 2 - 6: 84.411C

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

Applicant: National Math and Science Initiative (U411C190037)

Questions

Selection Criteria - Quality of the Project Evaluation

1. **The Secretary considers the quality of the evaluation to be conducted of the proposed project. In determining the quality of the evaluation, the Secretary considers the following factors:**

   (1) The extent to which the methods of evaluation will, if well implemented, produce evidence about the project's effectiveness that would meet the What Works Clearinghouse standards with or without reservations as described in the What Works Clearinghouse Handbook (as defined in this notice).

   (2) The extent to which the evaluation will provide guidance about effective strategies suitable for replication or testing in other settings.

   (3) The extent to which the methods of evaluation will provide valid and reliable performance data on relevant outcomes.

   (4) The extent to which the evaluation plan clearly articulates the key project components, mediators, and outcomes, as well as a measurable threshold for acceptable implementation.

Strengths:

On p.39, interrupted time series design is clearly articulated and meets WWC standards with reservations. A group of 100 comparison schools will be matched on pre-test and demographic variables

On p.41, a plan is articulated to survey both treatment and control teachers related to instructional practices

Appendix I addresses power analysis and includes relevant data and calculations to allow for study replication for both student and teacher populations

The evaluation uses data collected from established measures including the AP CS exam and an NSF funded teacher instrument. The explanation of underlying assumptions related to power are included in appendix I. This plan could be used in its entirety by another grantee with similar goals and interventions.

- On p.42, the use of an externally validated measure of teacher use of computer science in the classroom is employed as a key measure. Data on psychometric properties of assessments in included in appendix I.
- On p.38, evaluator is identified beforehand
- In Appendix I, key measures, milestones, underlying assumptions and complete power calculations are included

Weaknesses:

On p.41, it is noted that 150 teachers will be surveyed with an online assessment. Non-response bias potential is not addressed. The use of stipends is noted, but these are not evident in budget narrative. The use of cash incentives on a grant-funded project should be addressed in application via IRB for fiscal agent applicant.

Both teachers and students will leave the treatment and control schools and AP CS courses during the study period. Should this level of attrition be significant or pose a differential validity threat, the WWC "with reservations" design could

be compromised. The proposal does not include an explanation of how these cases will be handled in the degrees of freedom of the regression model in appendix I.

The data related to teachers is entirely reliant on self-reports. There appear to be no direct observations of teaching, summer activities, workshops, planning sessions or meetings of stakeholders. There is no mention of evaluation firm visiting the site at all during the project performance period.

There is no schedule for site visits from evaluation firm. Unclear if this evaluation will all be done remotely based on information provided.

Figure 4 included objectives related to both demographic compositions of AP classes and self-reported confidence in pursuit of a computer science career. These variables are not measured.

Figure 4 notes an increase in the number of schools offering the AP courses, but impact 2 on p.39 measures an "increase" in student participation rates. It appears some schools don't offer the course at baseline, while others do, which is a confounding variable.

Reader's Score: **15**

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Technical Review Coversheet

Applicant: National Math and Science Initiative (U411C190037)
Reader #2: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Quality of the Project Evaluation			
1. Project Evaluation		20	17
	Sub Total	20	17
	Total	20	17

Technical Review Form

Panel #3 - EIR Early Phase Tier 2 - 6: 84.411C

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

Applicant: National Math and Science Initiative (U411C190037)

Questions

Selection Criteria - Quality of the Project Evaluation

1. **The Secretary considers the quality of the evaluation to be conducted of the proposed project. In determining the quality of the evaluation, the Secretary considers the following factors:**

   (1) The extent to which the methods of evaluation will, if well implemented, produce evidence about the project's effectiveness that would meet the What Works Clearinghouse standards with or without reservations as described in the What Works Clearinghouse Handbook (as defined in this notice).

   (2) The extent to which the evaluation will provide guidance about effective strategies suitable for replication or testing in other settings.

   (3) The extent to which the methods of evaluation will provide valid and reliable performance data on relevant outcomes.

   (4) The extent to which the evaluation plan clearly articulates the key project components, mediators, and outcomes, as well as a measurable threshold for acceptable implementation.

Strengths:

The evaluation methods could potentially produce evidence about the project's effectiveness that meet What Works Clearinghouse standards with reservations. The applicant proposes a quasi-experimental comparative interrupted time series design to examine project impact on student achievement (pg. 18). Treatment and comparison schools will be matched using baseline Advanced Placement (AP) exam performance and school demographic data (pg. 19). A difference-in-differences design will be used to assess project effect on teacher instructional practices. The teacher treatment and comparison group sample sizes are acceptable as is the power analysis (pg. 20).

Various data will be collected to assess fidelity of program implementation, including attendance sign-in sheets and log-in and usage data from virtual PLCs (pg. 22). The applicant expects that the treatment group will be sufficient in size so that results can be generalized to other settings (pg. 23). Several robust measures will be administered to provide quality data and inform the evaluation. These measures include the AP Computer Science Principles exam and the High School Computer Science Teacher Questionnaire. The evaluation plan explicitly and substantially describes the key project components, mediators, outcomes, and measurable thresholds for acceptable implementation. For example, the evaluation will involve examination of one key mediator: program impact on teachers' instructional practice (pg. 19). Reasonable thresholds were offered, such as "75% of participants confirm the technology was received and was usable" (pg. 22).

Weaknesses:

The applicant does not sufficiently describe sample size and attrition in the research design. Although the project will involve 50 treatment and 100 comparison schools (pg. 18), it was unknown how many students would be included in the sample groups and the number expected to take the AP Computer Science Principles exam. The applicant also does not address potential attrition of students and teachers, which is a consideration for any quasi-experimental research design.

Reader's Score: **17**

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