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

Status: Submitted
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Technical Review Coversheet

Applicant: National Math and Science Initiative (U411A150009)
Reader #1: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		10	0
Strategy to Scale			
1. Strategy to Scale		35	0
Quality of Project Design and Management Plan			
1. Project Design/Mgmt. Plan		35	0
Quality of the Project Evaluation			
1. Project Evaluation		20	18
	Sub Total	100	18
Priority Questions			
Competitive Preference Priority			
Improving Cost-Effectiveness and Productivity			
1. CPP 1		3	0
Enabling Broad Adoption of Effective Practices			
1. CPP 2		5	0
	Sub Total	8	0
	Total	108	18

Technical Review Form

Panel #1 - i3 Scale-up Panel - 1: 84.411A

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

Applicant: National Math and Science Initiative (U411A150009)

Questions

Selection Criteria - Significance

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

   (1) 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.

   (2) The potential replicability of the proposed project or strategies, including, as appropriate, the potential for implementation in a variety of settings.

   (3) The extent to which the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available.

   Strengths:

   NA

   Weaknesses:

   NA

Reader's Score: **0**

Selection Criteria - Strategy to Scale

1. **In determining the applicant 's capacity to scale the proposed project, the Secretary considers the following factors:**

   (1) The extent to which the applicant demonstrates there is unmet demand for the process, product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application.

   (2) The extent to which the applicant will use grant funds to address a particular barrier or barriers that prevented the applicant, in the past, from reaching the level of scale proposed in the application.

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

   Strengths:

   NA

   Weaknesses:

   NA

Reader's Score: 0

Selection Criteria - Quality of Project Design and Management Plan

1. **In determining the quality of the project design and management plan for 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 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 clarity and coherence of the applicant' s multi-year financial and operating model and accompanying plan to operate the project at a national or regional level (as defined in this notice) during the project period.

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

   Strengths:

   NA

   Weaknesses:

   NA

Reader's Score: 0

Selection Criteria - Quality of the Project Evaluation

1. **In determining the quality of the project evaluation to be conducted, 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 Evidence Standards without reservations.

   (2) The clarity and importance of the key questions to be addressed by the project evaluation, and the appropriateness of the methods for how each question will be addressed.

   (3) The extent to which the evaluation will study the project at the proposed level of scale, including, where appropriate, generating information about potential differential effectiveness of the project in diverse settings and for diverse student population groups.

   (4) The extent to which the evaluation plan includes a clear and credible analysis plan, including a proposed sample size and minimum detectable effect size that aligns with the expected project impact, and an analytic approach for addressing the research questions.

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

   (6) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

Strengths:

The applicant presents a strong and credible evaluation plan that is likely to show evidence of high-quality project implementation and effectiveness. The applicant proposes to use a randomized control trial with random assignment of treatment schools and delayed control groups which would meet What Works Clearinghouse evidence standards without reservations. The applicant has a strong well established evaluation lead. The proposed project budget appears to be more than sufficient to carry out the evaluation effectively. The evaluation efforts are embedded in the project timelines, activities, and milestones which supports all the key components of the evaluation. The applicant proposes a solid plan to communicate, report, and disseminate evaluation results on a regular basis. There is a strong detailed logic model on page 25 that includes measurable project outcomes and expected project impact. The applicant also includes rich discussion on previous studies and evidence of project success on page 15 and illustrates how that research applies to and will be used in the study being proposed to produce similar results. The sample size, minimum detectable effect size was thoroughly discussed on page 45 to include specifics such as .80 power and details on how they plan to avoid making a Type 1 error. The applicant addresses diverse student groups and diverse settings expectation in one of the research questions about gender, race, and ethnicity.

Weaknesses:

The three evaluation questions on page 39 while uniquely categorized and focused do not align with the project objectives identified on page eight. There are too many evaluation questions. The applicant failed to sufficiently address how they would evaluate the pre-AP scores that they proposed as part of their assessment data collection.

Reader's Score: 18

Priority Questions

Competitive Preference Priority - Improving Cost-Effectiveness and Productivity

1. Competitive Preference Priority 1 Improving Cost-Effectiveness and Productivity (zero or 3 points)

Under this priority, we provide funding to projects that address one of the following areas:

(a) Substantially improving student outcomes without commensurately increasing per-student costs.

(b) Maintaining student outcomes while substantially decreasing per student costs.

(c) Substantially improving student outcomes while substantially decreasing per-student costs.

Other requirements related to Competitive Preference Priority 1:

An application addressing this priority must provide

(1) A clear and coherent budget that identifies expected student outcomes before and after the practice, the cost per student for the practice, and a clear calculation of the cost per student served;

(2) A compelling discussion of the expected cost-effectiveness of the practice compared with alternative practices;

(3) A clear delineation of one-time costs versus ongoing costs and a plan for sustaining the project, particularly ongoing costs, after the expiration of i3 funding;

(4) Identification of specific activities designed to increase substantially the cost-effectiveness of the practice, such as re-designing costly components of the practice (while maintaining efficacy) or testing multiple versions of the practice in order to identify the most cost effective approach; and

(5) A project evaluation that addresses the cost-effectiveness of the proposed practice.

Strengths:

NA

Weaknesses:

NA

Reader's Score: 0

Competitive Preference Priority - Enabling Broad Adoption of Effective Practices

1. **Competitive Preference Priority 2 Enabling Broad Adoption of Effective Practices (zero or 5 points)**

   Under this priority, we provide funding to projects that enable broad adoption of effective practices. An application proposing to address this priority must, as part of its application:

   (a) Identify the practice or practices that the application proposes to prepare for broad adoption, including formalizing the practice (i.e., establish and define key elements of the practice), codifying (i.e., develop a guide or tools to support the dissemination of information on key elements of the practice), and explaining why there is a need for formalization and codification.

   (b) Evaluate different forms of the practice to identify the critical components of the practice that are crucial to its success and sustainability, including the adaptability of critical components to different teaching and learning environments and to diverse learners.

   (c) Provide a coherent and comprehensive plan for developing materials, training, toolkits, or other supports that other entities would need in order to implement the practice effectively and with fidelity.

   (d) Commit to assessing the replicability and adaptability of the practice by supporting the implementation of the practice in a variety of locations during the project period using the materials, training, toolkits, or other supports that were developed for the i3-supported practice.

   Strengths:

   NA

   Weaknesses:

   NA

Reader's Score: 0

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Last Updated: 09/01/2015 01:54 PM

Technical Review Coversheet

Applicant: National Math and Science Initiative (U411A150009)
Reader #2: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		10	0
Strategy to Scale			
1. Strategy to Scale		35	0
Quality of Project Design and Management Plan			
1. Project Design/Mgmt. Plan		35	0
Quality of the Project Evaluation			
1. Project Evaluation		20	19
	Sub Total	100	19
Priority Questions			
Competitive Preference Priority			
Improving Cost-Effectiveness and Productivity			
1. CPP 1		3	0
Enabling Broad Adoption of Effective Practices			
1. CPP 2		5	0
	Sub Total	8	0
	Total	108	19

Technical Review Form

Panel #1 - i3 Scale-up Panel - 1: 84.411A

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

Applicant: National Math and Science Initiative (U411A150009)

Questions

Selection Criteria - Significance

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

   (1) 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.

   (2) The potential replicability of the proposed project or strategies, including, as appropriate, the potential for implementation in a variety of settings.

   (3) The extent to which the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available.

   Strengths:

   N/A

   Weaknesses:

   N/A

Reader's Score: **0**

Selection Criteria - Strategy to Scale

1. **In determining the applicant 's capacity to scale the proposed project, the Secretary considers the following factors:**

   (1) The extent to which the applicant demonstrates there is unmet demand for the process, product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application.

   (2) The extent to which the applicant will use grant funds to address a particular barrier or barriers that prevented the applicant, in the past, from reaching the level of scale proposed in the application.

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

   Strengths:

   N/A

   Weaknesses:

   N/A

Reader's Score: 0

Selection Criteria - Quality of Project Design and Management Plan

1. **In determining the quality of the project design and management plan for 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 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 clarity and coherence of the applicant' s multi-year financial and operating model and accompanying plan to operate the project at a national or regional level (as defined in this notice) during the project period.

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

   Strengths:

   N/A

   Weaknesses:

   N/A

Reader's Score: 0

Selection Criteria - Quality of the Project Evaluation

1. **In determining the quality of the project evaluation to be conducted, 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 Evidence Standards without reservations.

   (2) The clarity and importance of the key questions to be addressed by the project evaluation, and the appropriateness of the methods for how each question will be addressed.

   (3) The extent to which the evaluation will study the project at the proposed level of scale, including, where appropriate, generating information about potential differential effectiveness of the project in diverse settings and for diverse student population groups.

   (4) The extent to which the evaluation plan includes a clear and credible analysis plan, including a proposed sample size and minimum detectable effect size that aligns with the expected project impact, and an analytic approach for addressing the research questions.

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

   (6) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

Strengths:

The project logic model is included on p. 25 and shows the relationship among the activities, outputs, and intended outcomes. The three basic components of the project are to provide support for teachers, students and schools to increase the number of students taking and earning qualifying scores on AP math, science and English exams. This is based on the hypothesis that improving classroom teaching will improve student outcomes which will be tested using appropriate statistical techniques as described on pp. 39-40. The external evaluator will be UCLA CRESST which has previous experience in evaluating i3 grants and conducting rigorous research studies (p. 50). Evaluation methods include a randomized cluster trial with 20 randomly assigned treatment and 20 randomly assigned control schools (which will receive delayed treatment) which will allow for the ability to meet WWC evidence standards without reservations. Other evaluation methods include a comparative interrupted time series using comparison schools selected using propensity score matching. The evaluation will also measure and evaluate the fidelity of implementation among the treatment schools. The applicant has identified 11 research questions (pp. 40-41) related to the examination of the impact of student outcomes, the effects of program implementation, and to the qualitative outcomes and how they related to fidelity of implementation. Student-level data will be collected to determine any differential impacts by gender/race/ethnicity (p. 41). The applicant provides a detailed analysis plan on pp. 41-44 and in Appendix J-6. To further evaluate the impact of the program, the applicant will compare CRP school student data with that of data from non-CRP schools in the same state. The applicant explains in detail (pp. 45-47) the statistical power analysis used to calculate the MDES as reported in Appendix J-6. The [redacted] budget allocated for project evaluation appears to be reasonable and appropriate to accomplish the evaluation activities proposed.

Weaknesses:

Part of the proposed program is a pre-AP component for up to 32,000 students in grades 3-12, but there does not appear to be an evaluation element for this, possibly except for the utilization of surveys, interviews, focus groups and observations. However, this was not made explicit by the applicant. Since this appears to be an important part of the program, intended outcomes and evaluation methodology should have been more specific.

Reader's Score: 19

Priority Questions

Competitive Preference Priority - Improving Cost-Effectiveness and Productivity

1. **Competitive Preference Priority 1 Improving Cost-Effectiveness and Productivity (zero or 3 points)**

   Under this priority, we provide funding to projects that address one of the following areas:

   (a) Substantially improving student outcomes without commensurately increasing per-student costs.

   (b) Maintaining student outcomes while substantially decreasing per student costs.

   (c) Substantially improving student outcomes while substantially decreasing per-student costs.

   Other requirements related to Competitive Preference Priority 1:

   An application addressing this priority must provide

   (1) A clear and coherent budget that identifies expected student outcomes before and after the practice, the cost per student for the practice, and a clear calculation of the cost per student served;

   (2) A compelling discussion of the expected cost-effectiveness of the practice compared with alternative practices;

   (3) A clear delineation of one-time costs versus ongoing costs and a plan for sustaining the project, particularly ongoing costs, after the expiration of i3 funding;

(4) Identification of specific activities designed to increase substantially the cost-effectiveness of the practice, such as re-designing costly components of the practice (while maintaining efficacy) or testing multiple versions of the practice in order to identify the most cost effective approach; and

(5) A project evaluation that addresses the cost-effectiveness of the proposed practice.

Strengths:

N/A

Weaknesses:

N/A

Reader's Score: 0

Competitive Preference Priority - Enabling Broad Adoption of Effective Practices

1. **Competitive Preference Priority 2 Enabling Broad Adoption of Effective Practices (zero or 5 points)**

Under this priority, we provide funding to projects that enable broad adoption of effective practices. An application proposing to address this priority must, as part of its application:

(a) Identify the practice or practices that the application proposes to prepare for broad adoption, including formalizing the practice (i.e., establish and define key elements of the practice), codifying (i.e., develop a guide or tools to support the dissemination of information on key elements of the practice), and explaining why there is a need for formalization and codification.

(b) Evaluate different forms of the practice to identify the critical components of the practice that are crucial to its success and sustainability, including the adaptability of critical components to different teaching and learning environments and to diverse learners.

(c) Provide a coherent and comprehensive plan for developing materials, training, toolkits, or other supports that other entities would need in order to implement the practice effectively and with fidelity.

(d) Commit to assessing the replicability and adaptability of the practice by supporting the implementation of the practice in a variety of locations during the project period using the materials, training, toolkits, or other supports that were developed for the i3-supported practice.

Strengths:

N/A

Weaknesses:

N/A

Reader's Score: 0

Status: Submitted
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Last Updated: 09/02/2015 04:17 PM

Technical Review Coversheet

Applicant: National Math and Science Initiative (U411A150009)
Reader #3: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		10	8
Strategy to Scale			
1. Strategy to Scale		35	35
Quality of Project Design and Management Plan			
1. Project Design/Mgmt. Plan		35	30
Quality of the Project Evaluation			
1. Project Evaluation		20	0
	Sub Total	100	73
Priority Questions			
Competitive Preference Priority			
Improving Cost-Effectiveness and Productivity			
1. CPP 1		3	3
Enabling Broad Adoption of Effective Practices			
1. CPP 2		5	5
	Sub Total	8	8
	Total	108	81

Technical Review Form

Panel #1 - i3 Scale-up Panel - 1: 84.411A

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

Applicant: National Math and Science Initiative (U411A150009)

Questions

Selection Criteria - Significance

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

(1) 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.

(2) The potential replicability of the proposed project or strategies, including, as appropriate, the potential for implementation in a variety of settings.

(3) The extent to which the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available.

Strengths:

The applicant provided strong evidence to show that the project involves the development or demonstration of promising new strategies that build on existing strategies. This is demonstrated by the applicant writing that a growing body of evidence indicates that College Readiness Program (CRP) which was previously known as the Advanced Placement Training and Incentive Program [APTIP] or the Advanced Placement Incentive Program [APIP]) has significant and longer-term positive postsecondary and economic impacts. The program's consistent elements produce reliably successful and sustained outcomes across settings, states, subject areas, and students, including those students traditionally underrepresented in STEM. The applicant showed that their strategy will build on existing strategies by discussing that across studies, research questions consistently relate to the extent to which implementation of CRP is associated with increased percentages of high school students taking AP exams and increased percentages of students scoring 3 or higher on these exams, particularly in math, science, and English. The National Math and Science Initiative (NMSI) plans to implement the College Readiness Program (CRP) as an intervention in 10 LEAs, reaching 40 schools. CRP raises the academic bar in public schools by demonstrating that more students, especially high-need students, can master rigorous AP coursework, with a particular emphasis on math and science. (pp. e 116, 10)

The applicant provided clear details to show that the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available. For example, the applicant wrote that in Detroit, only 37 of the 5,620 African American and Hispanic 11th and 12th graders earned a qualifying score on a math or science AP exam in 2013; in St. Louis that number was only five of 2,782. To show there is a national need the applicant wrote that the average percentage of African American and Hispanic 11th and 12th graders earning a qualifying score on a math or science AP exam across the LEAs (excluding North Dakota and Cleveland) was only 1.7%. In North Dakota, there were only 18 qualifying math and science AP scores for every 1,000 high school juniors and seniors this is less than one-fifth the number for the U.S. To show that the proposed project will address a challenge the applicant discussed that CRP dares to tackle the STEM crisis at the high school level, when evidence shows it can be very difficult to catch up those students who lag behind. In addition, the applicant wrote that participating CRP schools rethink their AP culture by adopting open enrollment and recruiting more students, including high need and traditionally underrepresented students, into AP courses, thereby allowing many more students to succeed at that level. (pp. 19)

Weaknesses:

The applicant did not provide details to show their plans for replicability in a variety of settings. The increase in test scores for schools implementing CRP does not demonstrate a plan for replicability.

Reader's Score: 8

Selection Criteria - Strategy to Scale

1. **In determining the applicant 's capacity to scale the proposed project, the Secretary considers the following factors:**

   (1) The extent to which the applicant demonstrates there is unmet demand for the process, product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application.

   (2) The extent to which the applicant will use grant funds to address a particular barrier or barriers that prevented the applicant, in the past, from reaching the level of scale proposed in the application.

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

   Strengths:

   The applicant provided evidence to show the extent to which the applicant demonstrates there is an unmet demand for the process product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application. This is demonstrated by the applicant discussing that when NMSI issued an RFP to assess interest from local communities in replicating CRP in 2008, it received applications from organizations in 28 states. In addition, the U.S. Department of Defense (DoD) partnered with NMSI because of the significant demand for the program on military bases across the country, where continuity of high-quality curriculum and instruction is a particular concern for military families. Given the success of this regionally based approach, NMSI is now prepared to scale up eight regional hubs across the country. (pp. 21, 22)

   The applicant clearly articulated the extent to which grant funds would be used to address particular barriers that prevented the applicant, in the past, from reaching the level of scale proposed in the application. For example, the applicant discussed that they will directly address barriers to scale related to upfront investment required to implement CRP; availability of STEM-qualified mentor teachers to implement the program in selected regions; and school-level conditions that enable successful implementation of CRP. In addition, to addressing barriers, the applicant also wrote that by conducting activities to enable broad adoption of CRP practices, they will pave the way for addressing policy barriers that can limit adoption. (pp. 22, 23)

   The applicant clearly details the mechanisms they will use to broadly disseminate information on its project to support further development or replication. For example, the applicant wrote that at the conclusion of the grant period, we will publish a guidebook to train teachers on how to adopt content-rich instructional techniques to set high classroom expectations and shift students to advanced levels of thinking and learning. In addition, the applicant provided details to show how they planned to disseminate information by writing that project results from the UCLA independent evaluation will be disseminated both through the NMSI website and the Center for Research on Evaluation in Standards and Student Testing (CRESST) website (www.cresst.org), at regular conferences and workshops, and in peer reviewed publications. (pp. 24, 25)

   Weaknesses:

   No weaknesses noted.

Reader's Score: 35

Selection Criteria - Quality of Project Design and Management Plan

1. **In determining the quality of the project design and management plan for 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 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 clarity and coherence of the applicant' s multi-year financial and operating model and accompanying plan to operate the project at a national or regional level (as defined in this notice) during the project period.

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

Strengths:

The applicant provided details to show their goals, objectives, and outcomes to be achieved by the proposed project are clearly specified and measurable. For example, the applicant discussed that they will reach approximately 60,000 students over the course of the project, including 28,000 students directly enrolled in AP courses and an additional 32,000 students in grades 3–12. (pp. 28, 29)

The applicant clearly shows 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. This is demonstrated by the applicant providing a table to show activities and milestones such as in Year 1 and 2 the CRP team will enroll teachers in the NMSI system, and will also be responsible for starting student study sessions. NMSI's project leaders have experience managing large, complex, and rapidly growing projects, and their leadership team for this grant includes the Chief Financial Officer, who has overseen the budgets for several federal grants including the 2011 i3 validation grant. (pp. 31, 32)

The applicant provides clear details to show their adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project. This is shown by the applicant discussing that performance management and continuous improvement are a cornerstone of NMSI's CRP. NMSI plans to implement a continuous improvement process that reflects the need to engage LEA and school-based partners and maintain flexibility to course-correct quickly. To enable continuous improvement, the applicant plans to use data-driven decision making to refine approach. The applicant also discussed their plan for feedback at frequent intervals. (pp. 37)

Weaknesses:

The applicant did not provide details to show details showing clarity and coherence of their multi-year financial and operating model and accompanying plan to operate the project at a national or regional level during the project period.

Reader's Score: 30

Selection Criteria - Quality of the Project Evaluation

1. **In determining the quality of the project evaluation to be conducted, 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 Evidence Standards without

reservations.

(2) The clarity and importance of the key questions to be addressed by the project evaluation, and the appropriateness of the methods for how each question will be addressed.

(3) The extent to which the evaluation will study the project at the proposed level of scale, including, where appropriate, generating information about potential differential effectiveness of the project in diverse settings and for diverse student population groups.

(4) The extent to which the evaluation plan includes a clear and credible analysis plan, including a proposed sample size and minimum detectable effect size that aligns with the expected project impact, and an analytic approach for addressing the research questions.

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

(6) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

Strengths:

N/A

Weaknesses:

N/A

Reader's Score: 0

Priority Questions

Competitive Preference Priority - Improving Cost-Effectiveness and Productivity

1. **Competitive Preference Priority 1 Improving Cost-Effectiveness and Productivity (zero or 3 points)**

Under this priority, we provide funding to projects that address one of the following areas:

(a) Substantially improving student outcomes without commensurately increasing per-student costs.

(b) Maintaining student outcomes while substantially decreasing per student costs.

(c) Substantially improving student outcomes while substantially decreasing per-student costs.

Other requirements related to Competitive Preference Priority 1:

An application addressing this priority must provide

(1) A clear and coherent budget that identifies expected student outcomes before and after the practice, the cost per student for the practice, and a clear calculation of the cost per student served;

(2) A compelling discussion of the expected cost-effectiveness of the practice compared with alternative practices;

(3) A clear delineation of one-time costs versus ongoing costs and a plan for sustaining the project, particularly ongoing costs, after the expiration of i3 funding;

(4) Identification of specific activities designed to increase substantially the cost-effectiveness of the practice, such as re-designing costly components of the practice (while maintaining efficacy) or testing multiple versions of the practice in order to identify the most cost effective approach;

and

(5) A project evaluation that addresses the cost-effectiveness of the proposed practice.

Strengths:

The applicant provided details to show their plans for improving cost-effectiveness and productivity. For example, the applicant wrote that based on a project cost of [redacted] that includes the direct and indirect costs of the project, including NMSI's 50% match, but excluding the cost of the independent evaluation and related activities, the cost per student enrolled in AP courses is $940 and includes 28,000 students enrolled in AP courses tracked as part of the evaluation study to assess impact; the cost per student drops to $439 when they include both AP students and pre-AP students reached by teachers in grades 3–12 trained as part of NMSI's Laying the Foundation (LTF) program (32,000 additional students). To show further cost reduction the applicant wrote that NMSI seeks to further reduce the per-student cost of CRP to make broad and rapid scale-up even more cost effective. They have identified several components of the approach for which they will pilot redesign during this grant period to increase productivity and enable a cost-effective approach. (pp. 3, 4)

Weaknesses:

No weaknesses noted.

Reader's Score: 3

Competitive Preference Priority - Enabling Broad Adoption of Effective Practices

1. Competitive Preference Priority 2 Enabling Broad Adoption of Effective Practices (zero or 5 points)

Under this priority, we provide funding to projects that enable broad adoption of effective practices. An application proposing to address this priority must, as part of its application:

(a) Identify the practice or practices that the application proposes to prepare for broad adoption, including formalizing the practice (i.e., establish and define key elements of the practice), codifying (i.e., develop a guide or tools to support the dissemination of information on key elements of the practice), and explaining why there is a need for formalization and codification.

(b) Evaluate different forms of the practice to identify the critical components of the practice that are crucial to its success and sustainability, including the adaptability of critical components to different teaching and learning environments and to diverse learners.

(c) Provide a coherent and comprehensive plan for developing materials, training, toolkits, or other supports that other entities would need in order to implement the practice effectively and with fidelity.

(d) Commit to assessing the replicability and adaptability of the practice by supporting the implementation of the practice in a variety of locations during the project period using the materials, training, toolkits, or other supports that were developed for the i3-supported practice.

Strengths:

The applicant provided details to show their plans for enabling the broad adoption of effective practices. For example, the applicant wrote that this project would enable broad adoption in several ways such as NMSI developing a program that supports the strategic implementation of one of the only nationwide STEM college readiness programs, and the College Board's Advanced Placement (AP) program. The applicant also discussed that this will help broaden adoption because the AP program is already offered in 14,000 schools nationwide. (pp. 5)

Weaknesses:

No weaknesses noted.

Reader's Score: **5**

Status: Submitted
Last Updated: 09/02/2015 04:17 PM

Status: Submitted
Last Updated: 09/04/2015 04:09 PM

Technical Review Coversheet

Applicant: National Math and Science Initiative (U411A150009)
Reader #4: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		10	9
Strategy to Scale			
1. Strategy to Scale		35	34
Quality of Project Design and Management Plan			
1. Project Design/Mgmt. Plan		35	34
Quality of the Project Evaluation			
1. Project Evaluation		20	0
	Sub Total	100	77
Priority Questions			
Competitive Preference Priority			
Improving Cost-Effectiveness and Productivity			
1. CPP 1		3	3
Enabling Broad Adoption of Effective Practices			
1. CPP 2		5	5
	Sub Total	8	8
	Total	108	85

Technical Review Form

Panel #1 - i3 Scale-up Panel - 1: 84.411A

Reader #4: **********

Applicant: National Math and Science Initiative (U411A150009)

Questions

Selection Criteria - Significance

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

   (1) 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.

   (2) The potential replicability of the proposed project or strategies, including, as appropriate, the potential for implementation in a variety of settings.

   (3) The extent to which the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available.

   Strengths:

   Evaluation results show the intervention has a positive effect on AP exams completion rates and achievement of qualifying scores. Persistence and higher education success factor were found as well. Success of at-risk students in the program is demonstrable (p. 16). Past performance holds the promise of effective scalability. The development of school wide capacity that supports AP enrollments is a powerful component . The selected partners represent an ideal mix of differentiated and complex public school systems where the intervention should demonstrate success at scale. Student success in science AP courses accelerates and enhances an increase in the proportion of college students selecting STEM careers.

   Weaknesses:

   Validation results do not mention the proportion of AP exam completers matriculating in college STEM programs .

Reader's Score: **9**

Selection Criteria - Strategy to Scale

1. **In determining the applicant 's capacity to scale the proposed project, the Secretary considers the following factors:**

   (1) The extent to which the applicant demonstrates there is unmet demand for the process, product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application.

   (2) The extent to which the applicant will use grant funds to address a particular barrier or barriers that prevented the applicant, in the past, from reaching the level of scale proposed in the application.

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

Strengths:

The distribution of leadership and management into hubs is an effective strategy to achieve scale (p.21). Applications from districts exceed capacity to serve local needs. Success in the broad based, diverse, complex partner districts should serve to reduce barriers for similar school districts.

Weaknesses:

Recruitment of STEM qualified mentors needs further description and clearer methods. Dissemination strategy focus on research and higher education communities (e.g. CRESST) and may not reach prospective district clients.

Reader's Score: 34

Selection Criteria - Quality of Project Design and Management Plan

1. **In determining the quality of the project design and management plan for 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 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 clarity and coherence of the applicant' s multi-year financial and operating model and accompanying plan to operate the project at a national or regional level (as defined in this notice) during the project period.

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

Strengths:

The management plan helps client districts build local curriculum, instructional, and social capacity to increase enrollment in AP courses and to prepare student for AP course success at lower cost levels (p.25). Integration of resources of teacher support, the Teacher Portal (p.26), out-of-class supports, and financial incentives are likely to contribute of success at scale. The applicant has set bold student achievement goals. (p.29).

Weaknesses:

Goals do not include enrollment of students in STEM majors at the college level, an effective measure for the absolute priority selected.

Reader's Score: 34

Selection Criteria - Quality of the Project Evaluation

1. **In determining the quality of the project evaluation to be conducted, 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 Evidence Standards without reservations.

(2) The clarity and importance of the key questions to be addressed by the project evaluation, and the appropriateness of the methods for how each question will be addressed.

(3) The extent to which the evaluation will study the project at the proposed level of scale, including, where appropriate, generating information about potential differential effectiveness of the project in diverse settings and for diverse student population groups.

(4) The extent to which the evaluation plan includes a clear and credible analysis plan, including a proposed sample size and minimum detectable effect size that aligns with the expected project impact, and an analytic approach for addressing the research questions.

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

(6) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

Strengths:

n/a

Weaknesses:

n/a

Reader's Score: 0

Priority Questions

Competitive Preference Priority - Improving Cost-Effectiveness and Productivity

1. **Competitive Preference Priority 1 Improving Cost-Effectiveness and Productivity (zero or 3 points)**

   Under this priority, we provide funding to projects that address one of the following areas:

   (a) Substantially improving student outcomes without commensurately increasing per-student costs.

   (b) Maintaining student outcomes while substantially decreasing per student costs.

   (c) Substantially improving student outcomes while substantially decreasing per-student costs.

   Other requirements related to Competitive Preference Priority 1:

   An application addressing this priority must provide

   (1) A clear and coherent budget that identifies expected student outcomes before and after the practice, the cost per student for the practice, and a clear calculation of the cost per student served;

   (2) A compelling discussion of the expected cost-effectiveness of the practice compared with alternative practices;

   (3) A clear delineation of one-time costs versus ongoing costs and a plan for sustaining the project, particularly ongoing costs, after the expiration of i3 funding;

   (4) Identification of specific activities designed to increase substantially the cost-effectiveness of the practice, such as re-designing costly components of the practice (while maintaining efficacy) or testing multiple versions of the practice in order to identify the most cost effective approach; and

(5) A project evaluation that addresses the cost-effectiveness of the proposed practice.

Strengths:

Cost efficiencies are clearly delineated in terms of cost reductions per student for AP courses. A strong argument is made for working within schools in comparison with cost of starting new schools. Regional hubs, local mentors, and related local capacity development resources make scalability affordable.

Weaknesses:

none

Reader's Score: 3

Competitive Preference Priority - Enabling Broad Adoption of Effective Practices

1. **Competitive Preference Priority 2 Enabling Broad Adoption of Effective Practices (zero or 5 points)**

Under this priority, we provide funding to projects that enable broad adoption of effective practices. An application proposing to address this priority must, as part of its application:

(a) Identify the practice or practices that the application proposes to prepare for broad adoption, including formalizing the practice (i.e., establish and define key elements of the practice), codifying (i.e., develop a guide or tools to support the dissemination of information on key elements of the practice), and explaining why there is a need for formalization and codification.

(b) Evaluate different forms of the practice to identify the critical components of the practice that are crucial to its success and sustainability, including the adaptability of critical components to different teaching and learning environments and to diverse learners.

(c) Provide a coherent and comprehensive plan for developing materials, training, toolkits, or other supports that other entities would need in order to implement the practice effectively and with fidelity.

(d) Commit to assessing the replicability and adaptability of the practice by supporting the implementation of the practice in a variety of locations during the project period using the materials, training, toolkits, or other supports that were developed for the i3-supported practice.

Strengths:

The reorganization of centralized functions into a hub service model, and the training of mentors at localities will results in enhanced local capacity development. This is an effective strategy for continuous expansion.

Weaknesses:

none

Reader's Score: 5

Status: Submitted
Last Updated: 09/04/2015 04:09 PM

Status: Submitted
Last Updated: 09/03/2015 06:22 PM

Technical Review Coversheet

Applicant: National Math and Science Initiative (U411A150009)
Reader #5: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Significance			
1. Significance		10	9
Strategy to Scale			
1. Strategy to Scale		35	35
Quality of Project Design and Management Plan			
1. Project Design/Mgmt. Plan		35	33
Quality of the Project Evaluation			
1. Project Evaluation		20	0
	Sub Total	100	77
Priority Questions			
Competitive Preference Priority			
Improving Cost-Effectiveness and Productivity			
1. CPP 1		3	3
Enabling Broad Adoption of Effective Practices			
1. CPP 2		5	5
	Sub Total	8	8
	Total	108	85

Technical Review Form

Panel #1 - i3 Scale-up Panel - 1: 84.411A

Reader #5: **********

Applicant: National Math and Science Initiative (U411A150009)

Questions

Selection Criteria - Significance

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

(1) 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.

(2) The potential replicability of the proposed project or strategies, including, as appropriate, the potential for implementation in a variety of settings.

(3) The extent to which the proposed project addresses a challenge for which there is a national need for solutions that are better than the solutions currently available.

Strengths:

- The need for students to be proficient in math and science is statistically and clearly defined.
- (p9)
- The focus on improving AP scores for all students is supported by recent research and meets the appropriate national need grant criteria for solutions that are better than ones currently available. This is a strength because it empowers teachers to meet the needs of students in multiple regions. (p9/e25)
- The applicant uses strong data on which to make significant conclusions regarding previous program effectiveness. (p13)
- Due to diversity among schools using CRP in previous programs, it is clear that this grant program can be used in most any school nationwide. (p17)
- The proposal addresses the need to gear up the academic expectations for students in earlier grades. This is a unique strategy with strong potential to prepare more students for AP level curricula and with higher levels of achievement.

Weaknesses:

- The proposal could have used a stronger action plan for replicability.

Reader's Score: **9**

Selection Criteria - Strategy to Scale

1. **In determining the applicant 's capacity to scale the proposed project, the Secretary considers the following factors:**

(1) The extent to which the applicant demonstrates there is unmet demand for the process, product, strategy or practice that will enable the applicant to reach the level of scale that is proposed in the application.

(2) The extent to which the applicant will use grant funds to address a particular barrier or barriers that

prevented the applicant, in the past, from reaching the level of scale proposed in the application.

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

Strengths:

o The applicant provides sufficient statistics that ensure a strong need for this proposal. Some statistics are based on positive outcomes from their Validation grant. (p21)

o The applicant focuses on teaching talent within the schools it serves, breaking down financial barriers of travel expense from trainers outside the geographic areas of the schools. This also strengthens the proposal by empowering local talent to follow-up with project ideals once funding expires. (p23)

o Schools will have the personnel resources and toolkits (virtual and hard-copy) to continue this project long after the grant funding expires. These resources may be utilized by schools outside the LEAs. (p24)

Weaknesses:

No weaknesses were identified.

Reader's Score: 35

Selection Criteria - Quality of Project Design and Management Plan

1. **In determining the quality of the project design and management plan for 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 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 clarity and coherence of the applicant' s multi-year financial and operating model and accompanying plan to operate the project at a national or regional level (as defined in this notice) during the project period.

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

Strengths:

o Support systems are identified to address specific needs of students, teachers and schools. (p27)

o Substantial monetary awards may serve as motivators for both teachers and students. (p28)

o Goals are clear and measurable, with specific measurement tools predetermined. (p28-29)

o The applicant has established concrete criteria for selecting partner schools. The commitment from schools strengthens the proposal by ensuring buy-in from these schools regarding the activities and philosophy of the project. (p35)

o Specific measures are identified to guarantee ongoing continuous improvements to the project. (p37)

Weaknesses:

o Materials and equipment items, for student support, do not specify which grade level students will receive them. It is also vague as to what these items include. (p27)

Reader's Score: 33

Selection Criteria - Quality of the Project Evaluation

1. **In determining the quality of the project evaluation to be conducted, 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 Evidence Standards without reservations.

   (2) The clarity and importance of the key questions to be addressed by the project evaluation, and the appropriateness of the methods for how each question will be addressed.

   (3) The extent to which the evaluation will study the project at the proposed level of scale, including, where appropriate, generating information about potential differential effectiveness of the project in diverse settings and for diverse student population groups.

   (4) The extent to which the evaluation plan includes a clear and credible analysis plan, including a proposed sample size and minimum detectable effect size that aligns with the expected project impact, and an analytic approach for addressing the research questions.

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

   (6) The extent to which the proposed project plan includes sufficient resources to carry out the project evaluation effectively.

   Strengths:

   NA

   Weaknesses:

   NA

Reader's Score: 0

Priority Questions

Competitive Preference Priority - Improving Cost-Effectiveness and Productivity

1. **Competitive Preference Priority 1 Improving Cost-Effectiveness and Productivity (zero or 3 points)**

   Under this priority, we provide funding to projects that address one of the following areas:

   (a) Substantially improving student outcomes without commensurately increasing per-student costs.

   (b) Maintaining student outcomes while substantially decreasing per student costs.

   (c) Substantially improving student outcomes while substantially decreasing per-student costs.

   Other requirements related to Competitive Preference Priority 1:

   An application addressing this priority must provide

   (1) A clear and coherent budget that identifies expected student outcomes

before and after the practice, the cost per student for the practice, and a clear calculation of the cost per student served;

(2) A compelling discussion of the expected cost-effectiveness of the practice compared with alternative practices;

(3) A clear delineation of one-time costs versus ongoing costs and a plan for sustaining the project, particularly ongoing costs, after the expiration of i3 funding;

(4) Identification of specific activities designed to increase substantially the cost-effectiveness of the practice, such as re-designing costly components of the practice (while maintaining efficacy) or testing multiple versions of the practice in order to identify the most cost effective approach;
and

(5) A project evaluation that addresses the cost-effectiveness of the proposed practice.

Strengths:

Cost saving measures are identified, making funding more effective during the life of the grant as well as providing sustainability beyond the grant period. (p20) Current costs for the CRP programs are $940/student, but will drop to $439 upon completion of the i3 grant. This cost is identified as significantly lower than finances required to initiate a new college readiness-focused high school, while still accomplishing the goal of improving student learning in math, science and English. (p 4) Costs will also be efficient by identifying master teachers in each region and utilizing their skills in the NMSI mentorship initiative. (p 4) Hosting teacher training locally will reduce costs by eliminating the need for travel and potentially having to pay substitute teachers during the training period. (p5)

Weaknesses:

No weaknesses were identified

Reader's Score: 3

Competitive Preference Priority - Enabling Broad Adoption of Effective Practices

1. **Competitive Preference Priority 2 Enabling Broad Adoption of Effective Practices (zero or 5 points)**

Under this priority, we provide funding to projects that enable broad adoption of effective practices. An application proposing to address this priority must, as part of its application:

(a) Identify the practice or practices that the application proposes to prepare for broad adoption, including formalizing the practice (i.e., establish and define key elements of the practice), codifying (i.e., develop a guide or tools to support the dissemination of information on key elements of the practice), and explaining why there is a need for formalization and codification.

(b) Evaluate different forms of the practice to identify the critical components of the practice that are crucial to its success and sustainability, including the adaptability of critical components to different teaching and learning environments and to diverse learners.

(c) Provide a coherent and comprehensive plan for developing materials, training, toolkits, or other supports that other entities would need in order to implement the practice effectively and with fidelity.

(d) Commit to assessing the replicability and adaptability of the practice by supporting the implementation of the practice in a variety of locations during the project period using the materials, training, toolkits, or other supports that were developed for the i3-supported practice.

Strengths:

The National Math and Science Institute's College Readiness Program (CRP) has a proven record of success for improving student outcomes, including data that demonstrates significant impact on Advanced Placement (AP) courses in math, science and English. (p3) Their research shows that NMSI has made a significant impact on teaching and learning

and that the applicant is prepared to use CRP to meet similar needs in other LEAs. For these reasons, the i3 grant is certainly replicable and will benefit an extensive number of teachers and students. (p6)

Weaknesses:

No weaknesses were identified.

Reader's Score: **5**

Status: Submitted
Last Updated: 09/03/2015 06:22 PM