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

Status: Submitted
Last Updated: 06/29/2018 04:52 PM

Technical Review Coversheet

Applicant: The Curators of the University of Missouri (U423A180058)
Reader #1: **********

		Points Possible	Points Scored
Questions			
Selection Criteria			
Quality of Project Design			
1. Project Design		35	35
Significance			
1. Significance		20	18
Quality of the Management Plan			
1. Management Plan		25	24
Quality of the Project Evaluation			
1. Project Evaluation		20	18
	Sub Total	100	95
Priority Questions			
Competitive Preference Priority			
Promoting STEM Education/Computer Science			
1. CPP1		3	3
	Sub Total	3	3
	Total	103	98

Technical Review Form

Panel #2 - Supporting Effective Educator Development - 2: 84.423A

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

Applicant: The Curators of the University of Missouri (U423A180058)

Questions

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 proposed project represents an exceptional approach to the priority or priorities established for the competition.

   (2) The extent to which the training or Professional Development services to be provided by the proposed project are of sufficient quality, intensity, and duration to lead to improvements in practice among the recipients of those services.

   (3) The extent to which the services to be provided by the proposed project involve the collaboration of appropriate partners for maximizing the effectiveness of project services.

   (4) The extent to which the services to be provided by the proposed project are focused on those with greatest needs.

   (5) The extent to which the design of the proposed project is appropriate to, and will successfully address, the needs of the target population or other identified needs.

Strengths:

1. The proposal includes instructional strategies that support the 4 C's (e26). Teachers facilitate, rather than lecturing, and students are active participants in their learning (e26). The approach is grounded in research of what works in problem based learning and leads to increased retention of content knowledge and enhance problem solving skills and higher order thinking skills (e26). The successful eMINTS program has been modified specifically for the rural context and has proven results in improving student achievement in math and making significant changes to teachers' practices (e29). Teachers will learn how to create high-quality standards-based lesson plans (e27). Participating classrooms will utilize technology to teleconference with universities to help students see they can achieve it. Online component will connect rural teachers to other teachers in their field. There is a component to train administrators (e35).

2. One full day a month of training, some face-to-face Professional Development (PD) that will be general and apply to all content areas and online PD about pedagogical content specific strategies (e36). This is effective because it utilizes different modes of training and addresses specific content needs. Training goes from Fall 2019-Spring 2021 and will have 40 sessions totaling over 140 contact hours and 14 in-class coaching visits from a district trainer (e36). This is effect because it is sustained over time and personalized to each individual. This proposal includes school-based support, district level support, trained administrators, and an online community (e38). This multi-tiered support system sets the stage for a successful implementation. PD sustained over time, with coaching and follow-up is more likely to change practice.

3. This proposal leverages the support of a variety of stakeholders. Participating school districts are involved (e42) and have provided a letter of commitment. American Institutes for Research (AIR) will be the evaluation partner for this proposal (e42). The past collaboration between eMINTS and AIR has been described as a model for collaboration between researchers and evaluators (e42). Professors from the University of Missouri Information Science and Learning Technologies and their undergraduate students will be involved (e42). Regional PD Centers and Rural School Consortia in Missouri and Kansas will support their local schools as a part of this proposal (e43). In addition, the Missouri and Kansas State Departments of Education will be involved and advocate for this project at the state level (e43). A final partner to include is Kansas City Audio Visual who provides a match in the proposal, will also secure discounts for project

technology and provide technical support and training for participating schools (e43). Support at the school, district, and state level, as well as partners with evaluators and a vendor will help provide a supportive structure for success. This project represents a multi-level system of support utilizing regions and schools that can provide support within their building, which will make the project more likely to succeed.

4. This proposal plans to work with 58 rural middle schools (e25) and specifically recruited high needs schools in concentrated areas of Missouri and Kansas. Almost 90% of the schools who have committed to participate qualify for the Small Rural School Achievement (SRSA) or the Rural Low-Income Program (RLIP) and almost 50% of them are classified as remote (e44). From the recruited schools, those with the highest levels of poverty, the lowest levels of performance, and the most remote schools will be selected (e44). Almost 70% of the students in participating schools qualify for free or reduced lunch (e44). Rural schools typically lack funding, adequate staffing, and access to high quality PD (e24). This proposal will be addressing schools with high needs in an effective manner supporting teachers to increase their students' achievement.

5. Research has shown that eMINTS has been successful in high needs rural schools and has been able to lessen the achievement gap for Title I students and free/reduced lunch students (e45). Eighty percent of the schools who have committed to participate in this project report that it is difficult or extremely difficult to recruit teachers. They also showed a significant need for quality, sustained PD (e45). Over half of the students in these schools scored below the basic level in math, language arts, and science (e45-46). This proposal will make a difference in teacher support through PD and result in student achievement.

Weaknesses:

N/A

Reader's Score: 35

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 importance or magnitude of the results or outcomes likely to be attained by the proposed project, especially improvements in teaching and student achievement.

   (2) The extent to which the costs are reasonable in relation to the number of persons to be served and to the anticipated results and benefits.

   (3) The potential for the incorporation of project purposes, activities, or benefits into the ongoing program of the agency or organization at the end of Federal funding.

   (4) The extent to which the results of the proposed project are to be disseminated in ways that will enable others to use the information or strategies.

Strengths:

1. This proposal plans to increase student achievement, while increasing problem-solving ability, self-regulation skills, and academic and STEM mindset for students in rural areas (e25). The proposal plans to train 58 principals and all of the teachers (just over 400) at their schools, and in turn impact the achievement of almost 27,000 students (e47). In addition, the proposal hopes to contribute to the field of research in rural areas, since that is significantly smaller than the research on urban schools (e48). The proposal also helps to impact the work for preservice educators at the university level (e48). Overall, this proposal has a significant direct impact, as well as the potential for an infinite amount of an indirect impact.

2. By utilizing a train-the-trainer model, the training costs of this implementation of the eMINTS project will be reduced (e48). In addition, district capacity will be built because of this model. Technology will also assist in keeping the costs manageable by replacing half of the face-to-face training via online PD sessions (e49). The proposal cites research-based

amounts of spending on PD and technology per student in order to attain a significant change in teacher practice and the costs in this proposal are well below the numbers cited (e49).

3. The train-the-trainer model will assist in participating school districts to be able to continue to provide training and support beyond the scope of this proposal (e50). Since administrators are also trained, they will be developing a strategic plan for sustainability of the project in their school. The proposal will result in strengthened partnerships between eMINTS, regional training centers, and participating districts that can be continued beyond the scope of the grant. Lessons learned from this proposal will inform future implementations of eMINTS in similar contexts (e49).

4. Research results will be submitted to national professional and practitioner journals, as well as regional and statewide publications (e51). They will target publications that feature a rural connection. The eMINTS website will serve as a portal for open access to project materials (e51). eMINTS typically presents at a variety of national and state level conferences. Social media will also be used to promote the project (e51).

Weaknesses:

3. The proposal is unclear as to whether or not there are any recurring costs to continue the project beyond the timeframe of the grant. It is unclear if there are recurring fees to access affiliate materials, when portions of the narrative mention that materials be freely accessible to all via open source (e284-285).

4. Many of the conferences listed as possibilities for presenting the project are not accessible to teachers due to costs and location. This proposal would have been stronger if there was a plan to target local areas for sharing and/or specifically the National Forum to Advance Rural Education.

Reader's Score: 18

Selection Criteria - Quality of the Management Plan

1. The Secretary considers the quality of the management plan for the proposed project. In determining the quality of the 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 adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

1. The eMINTS project has 3 major goals-increase the number of teachers using highly effective teaching strategies, increase academic achievement in math, science, and language arts and implement a multi-tiered system of support (e52). Each of the goals are aligned to one or more of the research questions and have specific measurable outcomes and objectives. The objectives are all time bound and most of the outcomes have a specific time frame mentioned (e52-54).

2. The management plan is divided into 5 different areas: overall project preparation, preparing districts and schools for implementation, implementing with fidelity, implementing a system for internal formative feedback, and disseminating project results and reports (e54). The five areas are broken down into major activities with an accompanying timeline, and the person(s) responsible. (e233-237).
3. This proposal uses the agile project management approach of SCRUM management-implementing short developmental cycles that focus on continuous improvement (e55). eMINTS staff is in constant communication with the

participating schools. All stakeholders are surveyed bi-annually for feedback on PD sessions, staff interactions, and project goals. Yearly focus groups will be conducted. Virtual implementation meetings will give feedback on a district's particular needs. Formative data will also be collected during PD sessions. The evaluation team (AIR) will collect formative assessment data through surveys and interviews. Case studies will also be used to inform successful approaches and identify local implementation challenges in rural schools (e55). eMINTS staff will use this vast feedback to make ongoing adjustments (e55). They will meet bi-weekly to evaluate data and collaboratively make decisions, Twice yearly, they will meet for several days to review goals, benchmarks, and make revisions to the program (e55). There will also be monthly calls with the evaluator to look at the formative data they collect and with the regional development centers to coordinate their work with the districts (e55).

Weaknesses:

3. This proposal fails to clearly delineate the steps that will be taken to implement programmatic changes. There is a significant amount of formative data collected, but no clear steps outlining how the changes will impact current and future participants.

Reader's Score: 24

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 WWC standards with or without reservations as described in the WWC Handbook.

   (2) The extent to which the methods of evaluation will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes.

   (3) The extent to which the methods of evaluation include the use of objective performance measures that are clearly related to the intended outcomes of the project and will produce quantitative and qualitative data to the extent possible.

   (4) The extent to which the methods of evaluation will provide valid and reliable performance data on Relevant Outcomes.

   Note: Applicants may wish to review the following technical assistance resources on evaluation: (1) WWC Procedures and Standards Handbooks: https://ies.ed.gov/ncee/wwc/Handbooks (2) "Technical Assistance Materials for Conducting Rigorous Impact Evaluations": http://ies.ed.gov/ncee/projects/evaluationTA.asp; and (3) IES/NCEE Technical Methods papers: http://ies.ed.gov/ncee/tech_methods/. In addition, applicants may view two optional webinar recordings that were hosted by the Institute of Education Sciences. The first webinar discussed strategies for designing and executing well-designed Quasi-Experimental Design Studies and is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=23. The second webinar focused on more rigorous evaluation designs, discussing strategies for designing and executing studies that meet WWC evidence standards without reservations. This webinar is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=18.

Strengths:

1. This proposal plans to partner with a well-known third-party evaluator that has a solid reputation in the field (e56). The summative component involves student and teacher outcomes and uses a design following WWC standards without reservations (e56). The proposal includes a chart with the 4 research questions, correlated with the data sources. This proposal includes a clearly delineated logic model (e232) and a chart that outlines the evaluation plan into Major Activities and Related Deliverables with a timeline (e287-289). Teacher attrition will not affect the data and since this is a school-wide program, treatment and control groups will be school-wide and the control group will not have access to the PD (e58). Standardized test scores will be used standardized by grade level, subject, and state (e58) to answer research question 1.

2. Research questions 5-9 will involve data that is more formative in nature and will contain both quantitative and

qualitative data (e61). This data will be evaluated jointly between eMINTS and AIR staff to support the continuous improvement process.

3. This proposal includes objective measures (test scores) that are directly related to program outcomes and because of the depth of the evaluation plan (e287-289) a variety of quantitative and qualitative data will be collected that will enable a deeper understanding of teacher learning and development throughout this project (e64).

4. This proposal clearly outlines a variety of outcomes they intend to measure. Standardized test scores are often used to evaluate student achievement and instruments used to measure research questions 2-4 will be based off of other instruments that have already been deemed valid and reliable (e59). Triangulation of data sources and cross-case analyses will be utilized as well (e64-65).

Weaknesses:

1. The third-party evaluator has been previously engaged with the eMINTS project. It may be more validating to use a different evaluator

2. The proposal states that indicators will be provided at the individual level and school level as appropriate (e63). This would be stronger if it was more clear what "as appropriate" means. Though there is a clearly delineated plan to collect the formative data, it is unclear how the data will be implemented in order to impact the current proposal versus future iterations of the project.

Reader's Score: 18

Priority Questions

Competitive Preference Priority - Promoting STEM Education/Computer Science

1. **Projects designed to improve student achievement or other educational outcomes in one or more of the following areas: Science, technology, engineering, math, or Computer Science. These projects must address the following priority area:**

   Increasing the number of educators adequately prepared to deliver rigorous instruction in STEM fields, including Computer Science, through recruitment, Evidence-Based Professional Development strategies for current STEM educators, or evidence-based retraining strategies for current educators seeking to transition from other subjects to STEM fields.

Strengths:

The eMINTS model is well suited to inter-disciplinary and integrated STEM projects (e30). This proposal is designed to assist teachers with integrating authentic engineering design tasks across core content areas to solve problems in their rural context (e30-31). Teachers involved in this project will learn to provide opportunities for students to engage with challenging math and science problem-solving pertinent to their particular context (e34).

Weaknesses:

None found

Reader's Score: 3

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

		Points Possible	Points Scored
Questions			
Selection Criteria			
Quality of Project Design			
1. Project Design		35	35
Significance			
1. Significance		20	20
Quality of the Management Plan			
1. Management Plan		25	24
Quality of the Project Evaluation			
1. Project Evaluation		20	18
	Sub Total	100	97
Priority Questions			
Competitive Preference Priority			
Promoting STEM Education/Computer Science			
1. CPP1		3	3
	Sub Total	3	3
	Total	103	100

Technical Review Form

Panel #2 - Supporting Effective Educator Development - 2: 84.423A

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

Applicant: The Curators of the University of Missouri (U423A180058)

Questions

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 proposed project represents an exceptional approach to the priority or priorities established for the competition.

   (2) The extent to which the training or Professional Development services to be provided by the proposed project are of sufficient quality, intensity, and duration to lead to improvements in practice among the recipients of those services.

   (3) The extent to which the services to be provided by the proposed project involve the collaboration of appropriate partners for maximizing the effectiveness of project services.

   (4) The extent to which the services to be provided by the proposed project are focused on those with greatest needs.

   (5) The extent to which the design of the proposed project is appropriate to, and will successfully address, the needs of the target population or other identified needs.

   Strengths:

   (1) The program proposed, eMINTS, is an instructional model that integrates strategies that are essential for STEM teaching, such as critical thinking, interdisciplinary teaching, collaborative learning, problem solving, connecting schools to work experiences, and familiarizing teachers with the use of technology (p. e25-e26, p. e30-e31, Appendix F, p. e240-254). The proposal focuses on improving the quality of teaching overall, but particularly teachers of mathematics, language arts, and sciences for students in grades 7 and 8 (Goal 2, p. e37). Research on eMINTS (p. e26-e29) shows evidence of effectiveness on these two STEM fields (mathematics and science), including in rural schools, the focus of the current project. The proposed project is thus a high-quality approach to teaching, including STEM teaching.

   (2) The project, as described on p. e36-e38, offers 140 contact hours with a mix of face-to-face and online activities, in addition to 14 in-class visits with the district trainer (p.e35-e36). A detailed description of the PD is found on Appendix F, p.e241-e254. The project will also prepare district trainers (p. e38) and administrators (p. e40), and will maintain an online community of practice (p. e41) to sustain the learning after the PD is completed. The application demonstrates a project that has sufficient quality, intensity and duration to improve teachers' knowledge and practice.

   (3) The eMINTS National Center is part of the University of Missouri (p.e41). For this project, the university has ensured the participation and support of an impressive list of partner), which include the Regional PD Centers and the Rural School Consortia in Missouri and Kansas, the Missouri State University Agency for Teaching, Leading and Learning, Greenbush Southeast Kansas Education Service Center. Southwest Plains Regional Service Center, and others (p. e42-e46). It has also the support from the departments of education in the target states; 58 rural middle schools in Missouri and Kansas are committed to participate (p. e42-e46; Appendix D, p. e131-e228). It is a strong partnership that comprises all key organizations.

   (4) According to the applicant (p. e44), 88% of the schools that have already committed to participate are small, rural middle schools; 46% of these schools are classified as remote and located in areas of economic depression (p. e44). School data displayed on Appendix F (p. e255-e260) show that the majority of schools have 50% or more of its students eligible for Free and Reduced Meals program and/or below performance on state assessments. The applicant clearly

demonstrates that the schools to be served are high-needs.

(5) The applicant proposes a well-designed, evidence-based instructional model. The project is tailored to the rural schools and prioritizes the teaching of Mathematics and Science at grades 7 and 8. The program proposed has been extensively researched with evidence of success. The project, if successfully implemented, has strong potential to improve teaching, including STEM teaching.

Weaknesses:

None found.

Reader's Score: 35

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 importance or magnitude of the results or outcomes likely to be attained by the proposed project, especially improvements in teaching and student achievement.

(2) The extent to which the costs are reasonable in relation to the number of persons to be served and to the anticipated results and benefits.

(3) The potential for the incorporation of project purposes, activities, or benefits into the ongoing program of the agency or organization at the end of Federal funding.

(4) The extent to which the results of the proposed project are to be disseminated in ways that will enable others to use the information or strategies.

Strengths:

(1) The five-year project proposes to serve 58 administrators, 406 teachers, and 26,796 students in 58 rural middle schools (grades 7-8) (p. e47). Based on previous research, the applicant expects an effect size for the project of 0.33 related to integration of technology in instruction and positive classroom interactions (p. e47). Impact of the project on student understanding of STEM and achievement is also estimated (p. e47). Considering these estimates, the project has the potential to produce relevant outcomes of robust magnitude

(2) Pages e48-e49 present a discussion on cost/benefits for the project. A review of the Budget Narrative (p. e289-297) shows that the participant schools (both the treatment and control groups) will be provided with technology material, including laptops for teachers and students. Stipends for teachers to attend the training are also included. In the first project year about half of the federal amount requested will go to hardware for the treatment schools (the same for the control group in year 3). Therefore, in addition to providing the schools with PD, the project brings technology into the schools. The costs are truly reasonable in view of the benefits.

(3) The project is not about creating a PD program, which already exists, but bringing it to more rural schools. There are no concerns about its continuity, since the University owns it. At the school level, the potential for continuity is strengthened by their stated interest on the program (p. e46; Appendix D, p. e131-e228), the added technology that they will be receiving, the preparation of local trainers (p. e50), the sustainability plan that school administrators are requested to prepare (p. e50), and the partnership with the Regional Resource Centers (p. e50). The applicant has demonstrated that the project has strong potential to be sustainable beyond the grant years.

(4) The dissemination plan on p. e51 is carefully designed and has the potential to reach a broad audience. It covers academic venues (conferences, peer reviewed journals, books), professional venues (participation in professional conferences, publication in practitioner journals, publications geared toward rural schools), and the use of social media.

Weaknesses:

None found.

Reader's Score: 20

Selection Criteria - Quality of the Management Plan

1. **The Secretary considers the quality of the management plan for the proposed project. In determining the quality of the 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 adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

(1) The project has three goals: Increase the number and quality of rural teachers; increase academic achievement in mathematics, language arts and science for 7th and 8th grade students in high-needs rural schools; and implement a multi-level support system for an efficient and effective model of eMINTS. Goals, objectives and outcomes, are detailed on p. e52-e54. Outcomes are measurable and have been informed by previous research.

(2) A management plan is presented on Appendix F, p. e232-e240. Table 1 (p. e233-e237) includes activities, timeline and responsibilities distributed through four goals: prepare for a successful project study; prepare the schools for a successful implementation; implement a system of internal feedback; and disseminate project information (p. e233). A description of the main activities within each project year is found on p. e55. Key personnel and time commitment are found in the budget narrative (p. e289).

(3) The continuous improvement process is based upon the implementation of short development cycles of plan/do/review (p. e55). Participants are surveyed bi-annually, focus groups are held at the end of the school year, formative assessments are applied during PD sessions, and virtual implementation team meetings are held (p. 56). Additionally, the evaluator will work closely with the applicant to share evidence from the evaluation (p. 56).

Weaknesses:

(3) Bi-annual and annual feedbacks are insufficient for a continuous improvement plan that is based on a plan/do/review model. While the applicant mentions methods, such as formative assessments and virtual meetings; it is important to understand whether the formative assessments are conducted before and after a PD series (pre/post design), and if the virtual meetings are monthly or even more frequently. Some information about the frequency of these activities would strengthen the plan and corroborate the initial statement of a plan/do/review continuous improvement approach.

Reader's Score: 24

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 WWC standards with or without reservations as described in the WWC

Handbook.

(2) The extent to which the methods of evaluation will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes.

(3) The extent to which the methods of evaluation include the use of objective performance measures that are clearly related to the intended outcomes of the project and will produce quantitative and qualitative data to the extent possible.

(4) The extent to which the methods of evaluation will provide valid and reliable performance data on Relevant Outcomes.

Note: Applicants may wish to review the following technical assistance resources on evaluation: (1) WWC Procedures and Standards Handbooks: https://ies.ed.gov/ncee/wwc/Handbooks (2) "Technical Assistance Materials for Conducting Rigorous Impact Evaluations": http://ies.ed.gov/ncee/projects/evaluationTA.asp; and (3) IES/NCEE Technical Methods papers: http://ies.ed.gov/ncee/tech_methods/. In addition, applicants may view two optional webinar recordings that were hosted by the Institute of Education Sciences. The first webinar discussed strategies for designing and executing well-designed Quasi-Experimental Design Studies and is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=23. The second webinar focused on more rigorous evaluation designs, discussing strategies for designing and executing studies that meet WWC evidence standards without reservations. This webinar is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=18.

Strengths:

(1) The evaluation uses a Randomized Control Trial (RCT) design to assess the impact of the program on teaching and learning, as described on p. e57-e61. Instruments for data collection are described on p. e57-e60. The instruments adopted for the formative evaluation have established psychometrics, as described on p. 59-e60. Appendix F-10 (p.e264-e266) details the analysis model. The proposed design meets the WWC standards without reservations.

(2) As stated on p. e61, evaluation findings will be shared with implementers through interim briefs with key findings, in addition to the yearly reports. On p. e56, the applicant states about a partnership with the evaluation for ongoing sharing of data.

(3) The research questions (Table 2, p. e57 and Table 3, p. e63) address the project's goals, as described in the logic model at p. e232. The formative evaluation (p. e63-e65) focuses on how the project is changing teacher knowledge and teaching practices, while the outcome or impact evaluation address the effectiveness of the project to provide improvements that are greater than those provided by the traditional PDs. Data collected/analyzed include surveys, interviews, focus groups (quantitative) and test scores (quantitative). It is a thorough plan that addresses the project goals.

(4) This is a well-designed RCT, complemented by a formative evaluation that focuses on continuous improvement. The evaluator discusses in details the potential magnitude of the evaluation findings (p. e60-e61). There is no doubt that the evaluation has the potential to provide valid and reliable data on the project's performance and important information for the education field, particularly related to rural schools.

Weaknesses:

(2) On p. e62, the evaluator states that data analyses will be conducted "on multiple points in time" (p. e62); more information about those multiple points in time are necessary to understand the role of the evaluation as a component of the continuous improvement plan. This role is not clear under the project evaluation section (p. e56-e67), not under the sub-section on feedback and continuous improvement (p. e55-e56) .

Reader's Score: 18

Priority Questions

Competitive Preference Priority - Promoting STEM Education/Computer Science

1. **Projects designed to improve student achievement or other educational outcomes in one or more of the following areas: Science, technology, engineering, math, or Computer Science. These projects must address the following priority area:**

   Increasing the number of educators adequately prepared to deliver rigorous instruction in STEM fields, including Computer Science, through recruitment, Evidence-Based Professional Development strategies for current STEM educators, or evidence-based retraining strategies for current educators seeking to transition from other subjects to STEM fields.

   Strengths:

   The project expands eMINTS to rural schools in two southern states. The program, eMINTS, is an instructional model that relies on the basic concepts of STEM: critical thinking, hands-on experiences, cooperative learning, interdisciplinary teaching, problem solving, and use of technology. The project will bring technology into the participant schools, and focus on improving achievement in mathematics and science, in addition to English, for students on grades 7 and 8. To achieve this focus, the project will essentially improve teachers' understanding of STEM, introduce them to the principles of STEM teaching, and familiarize them with the use of technology. Therefore, it has the potential to increase the number and quality of educators adequately prepared to deliver rigorous instruction in STEM fields, as required by the competitive preference priority.

   Weaknesses:

   None found.

Reader's Score: **3**

Status: Submitted
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Technical Review Coversheet

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

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Questions			
Selection Criteria			
Quality of Project Design			
1. Project Design		35	35
Significance			
1. Significance		20	19
Quality of the Management Plan			
1. Management Plan		25	25
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1. Project Evaluation		20	18
	Sub Total	100	97
Priority Questions			
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Promoting STEM Education/Computer Science			
1. CPP1		3	3
	Sub Total	3	3
	Total	103	100

Technical Review Form

Panel #2 - Supporting Effective Educator Development - 2: 84.423A

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

Applicant: The Curators of the University of Missouri (U423A180058)

Questions

Selection Criteria - Quality of Project Design

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   (3) The extent to which the services to be provided by the proposed project involve the collaboration of appropriate partners for maximizing the effectiveness of project services.

   (4) The extent to which the services to be provided by the proposed project are focused on those with greatest needs.

   (5) The extent to which the design of the proposed project is appropriate to, and will successfully address, the needs of the target population or other identified needs.

Strengths:

(1) The applicants have utilized their experience and expertise with prior projects implementing eMINTS to propose an expansion of this program specifically targeting high needs students in rural Missouri and Kansas who are not meeting basic requirements for proficiency at grade level. Pedagogy will be delivered online, subject area will occur via face-to-face instruction and collaborative interaction, in-class mentoring and coaching, and administrators and district level facilitators will also be trained. This approach ensures that the needs of all stakeholders will be addressed and help ensure the success of the project in the short- and long-term.
(2) The instruction and training appear to be of sufficient intensity, duration and quality and the applicants present evidence supporting this. Teachers will complete 40 session, 140 hrs of face-to-face and flipped online PD, 14 in-class sessions with district trainer, one full day of PD focused on use of the technology for learning and teaching each month; eMINTS will host in-class mentoring and coaching to help with reflective exercises and implementation and practice (pe35).
(3) The applicants have given detailed information about their partners, their expertise and specific responsibilities (pe42-43). AIR for example has 65 years' experience doing evaluation and professionals from the UMissouri also have an excellent track record in PD and the quality of these partners will ensure that the project achieves its goals, objectives and outcomes.
(4) Students in Kansas and Missouri are challenged by poverty (67% reduced or free-lunch) and lack of resources in rural areas. The impact of this is seen in the very high percentages of students who do not meet the basic or at-grade-level proficiency (pe44).
(5) The applicants have proposed an intervention project to increase student achievement that is designed to specifically address barriers in the education of students who attend schools in rural areas.

Weaknesses:

None found

Reader's Score: 35

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 importance or magnitude of the results or outcomes likely to be attained by the proposed project, especially improvements in teaching and student achievement.

   (2) The extent to which the costs are reasonable in relation to the number of persons to be served and to the anticipated results and benefits.

   (3) The potential for the incorporation of project purposes, activities, or benefits into the ongoing program of the agency or organization at the end of Federal funding.

   (4) The extent to which the results of the proposed project are to be disseminated in ways that will enable others to use the information or strategies.

   Strengths:

   (1) The applicants present previous evidence that shows that eMINTS significantly improved student achievement increasing the likelihood that the expanded implementation described in this proposal for teachers and students in rural Missouri and Kansas will be successful. With successful implementation of this project, the long-term impact on student achievement and the implications for generations to come and on local and regional economies in rural areas could be quite significant.
   (2) The cost of $547/student (pe49) seems quite reasonable and based on the potential positive impact the proposed project could have is outstanding.
   (3) The overall design of the program lends to its ready transferability after the period of Federal funding ends. This will be accomplished through the school-based implementation, district and regional trainers who will have the expertise to help teachers, trained administrators, and the availability of free resources online. (pe41).
   (4) The applicants have deep experience with dissemination of research and have outlined an excellent plan to achieve this goal (pe51). They will utilize conferences, workshops, journals, that have national, state, and regional reach. They have also explained how they will use digital technologies to extend their reach and inform others about their successful approach.

   Weaknesses:

   (3) Affiliate materials have a cost (pe284-285) and this could have a negative impact on teacher’s ability to participate after Federal funding has ended.

Reader's Score: 19

Selection Criteria - Quality of the Management Plan

1. **The Secretary considers the quality of the management plan for the proposed project. In determining the quality of the 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 adequacy of procedures for ensuring feedback and continuous improvement in the operation of the proposed project.

Strengths:

(1) The applicants have detailed the project's specific goals and objective measures and outcomes that are applicable to the education and training of teachers and students in rural school (pe52-54)—increase the number of rural teachers using teaching strategies that are highly effective, increase academic achievement for high-needs 7th and 8th graders, implement multiple level system of support for efficient and effective model of eMINTS that integrates STEM across subjects. All components are well designed and give high confidence that the project will be successful.
(2) The applicants present evidence of their prior success in eMINTS implementation (pe29), management of i3 and i2 validation grants and their training of 420 affiliate trainers in 10 states and Australia to the tune of $37m. On p452-56 the applicants list in depth the milestone targets in Appendix F.2 and F.3. The combination of these suggests that the management plan is designed for efficient implementation and monitoring of the proposed project.
(3) By manner of the program design, one activity leads to the next (eg. teachers trained, face-to-face discussion, feedback, engagement of community of online learners, observation by trained district facilitators) and thus each training component is interdependent providing built-in checks and balances that ensure that timely feedback (via one-on-one contact, surveys, virtually, formative assessments and interviews) can be obtained in order to address any problems that might arise. This approach is informed by evidence--SCRUM project management (pe55).

Weaknesses:

None found

Reader's Score: 25

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 WWC standards with or without reservations as described in the WWC Handbook.

   (2) The extent to which the methods of evaluation will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes.

   (3) The extent to which the methods of evaluation include the use of objective performance measures that are clearly related to the intended outcomes of the project and will produce quantitative and qualitative data to the extent possible.

   (4) The extent to which the methods of evaluation will provide valid and reliable performance data on Relevant Outcomes.

   Note: Applicants may wish to review the following technical assistance resources on evaluation: (1) WWC Procedures and Standards Handbooks: https://ies.ed.gov/ncee/wwc/Handbooks (2) "Technical Assistance Materials for Conducting Rigorous Impact Evaluations": http://ies.ed.gov/ncee/projects/evaluationTA.asp; and (3) IES/NCEE Technical Methods papers: http://ies.ed.gov/ncee/tech_methods/. In addition, applicants may view two optional webinar recordings that were hosted by the Institute of Education Sciences. The first webinar discussed strategies for designing and executing well-designed Quasi-Experimental Design Studies and is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=23. The second webinar focused on more rigorous evaluation designs, discussing strategies for designing and executing studies that meet WWC evidence standards without reservations. This webinar is available at: http://ies.ed.gov/ncee/wwc/Multimedia.aspx?sid=18.

Strengths:

(1) The study is a clustered randomized control trial of the eMINTS program in 58 rural middle schools from Kansas and Missouri with a crossover occurring after the study years (pe58). This design and the expected impact on 406 teachers and 26796 students over the five-year project is expected to meet WWC without reservations. They have also considered strategies to minimize group contamination and any potential teacher attrition and school level analyses.
(2) The applicants in Table 3 (pe62) have outlined an excellent plan for how they will use qualitative and quantitative

formative evaluations aligned with the project goals to obtain continuous feedback and assess the program as it is implemented.
(3) The applicants have developed clear performance measures including ELA scores, math, science, non-cognitive skills (STEM engagement, confidence, interest), teacher instructional practice, quality of lesson plans, and the specific tools to quantify them (Missouri or Kansas Assessments, STEM mindset, Self-Efficacy for Self-Regulated Learning Scale, CLASS-S). The approach is excellent and will result in useful qualitative and quantitative data directly related to the intended outcomes.
(4) The applicants have done power analyses to estimate (pe60) the minimum MDES suggesting that their methods of data collection and evaluation will be suitable for obtaining reliable data on the relevant outcomes.

Weaknesses:

(4) The applicants provide evidence that in some rural schools, students outperform low-income counterparts in urban schools (pe33). They do not fully discuss how the randomization amongst the targeted schools will ensure an adequate mix so as to minimize errors (pe44).

Reader's Score: **18**

Priority Questions

Competitive Preference Priority - Promoting STEM Education/Computer Science

1. **Projects designed to improve student achievement or other educational outcomes in one or more of the following areas: Science, technology, engineering, math, or Computer Science. These projects must address the following priority area:**

   Increasing the number of educators adequately prepared to deliver rigorous instruction in STEM fields, including Computer Science, through recruitment, Evidence-Based Professional Development strategies for current STEM educators, or evidence-based retraining strategies for current educators seeking to transition from other subjects to STEM fields.

Strengths:

The project addresses achievement in STEM by training teachers how to integrate STEM topics and engineering in a manner that will engage students and show how it is relevant to challenges found in rural areas.

Weaknesses:

None found

Reader's Score: **3**

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