

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

Status: Submitted

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## Technical Review Coversheet

**Applicant:** American Museum of Natural History (U336S140026)

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

	Points Possible	Points Scored
<b>Questions</b>		
<b>Selection Criteria</b>		
<b>Significance</b>		
1. Significance	15	15
<b>Quality of Project Design</b>		
1. Project Design	45	40
<b>Quality of the Management Plan</b>		
1. Management Plan	20	20
<b>Quality of the Project Evaluation</b>		
1. Project Evaluation	20	17
<b>Priority Questions</b>		
<b>Competitive Preference Priority 1</b>		
<b>Promoting STEM Education</b>		
1. CPP 1	5	5
<b>Competitive Preference Priority 2</b>		
<b>Implementing Academic Standards</b>		
1. CPP 2	2	0
<b>Total</b>	<b>107</b>	<b>97</b>

# Technical Review Form

Panel #8 - 2014 TQP Grant Review - 8: 84.336S

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

Applicant: American Museum of Natural History (U336S140026)

## Questions

### Selection Criteria - Significance

1. 1) The Secretary considers the significance of the proposed project.
- 2) In determining the significance of the proposed project, the Secretary considers the following factors:
  - i) The extent to which the proposed project is likely to build local capacity to provide, improve, or expand services that address the needs of the target population.
  - ii) The likelihood that the proposed project will result in system change or improvement.
  - iii) The extent to which the proposed project will prepare personnel for fields in which shortages have been demonstrated.

### Strengths:

(i) The applicant effectively demonstrates that the proposed TQP project designed to expand and promote STEM educated teachers to serve science teachers in high-needs schools. The proposed AMNH MAT-R project builds on an already piloted urban teacher residency to develop STEM competency in middle and high school students particularly among groups underrepresented in science such as African American and Hispanic students, English Language Learners (ELLs), and students with disabilities. (pgs. 2-4) In the targeted State of New York, Earth science is considered one of the gateway science courses to more advanced chemistry and physics and to AP-level science courses. The course is the first pathway course before the State Earth Science Regent exam. Thus, it is significant to developing competent teachers who are able capable of teaching the course content and increasing a student's chance of passing the exam. (pgs. 4-5)

(ii) The applicant clearly demonstrates that the proposed project has the potential for system improvement for science teachers in high need schools. The proposed teacher residency program is unique and innovative. The partnership with the American Museum of Natural History teacher preparation program offers a different level of preparation of science teachers. The program focuses not only on developing classroom teachers, but also on developing teachers with high-quality research-based science teaching practices, which is critical for new teachers to master effective student learning of key scientific concepts. The new and current science knowledge and research that program participants will learn onsite at the museum can be shared with mentor teachers, thus allowing them to learn alongside pre-service and new teachers within the teacher residency site school. (pgs. 4-8) The teacher residency program has the potential for improving the curriculum and increasing the interest in science for students.

(iii) The applicant effectively demonstrates that the proposed program to train earth science address not only a local and state problem, but also a national shortage of science teachers. (pgs. 8-10) The current shortage prevents many schools from offering an Earth science course, thus severely limiting students' opportunities to study this subject and prepare for the NYS Regents Examination in Earth science, or to prepare for higher education opportunities or careers in this field.

Additionally, the proposed project will address the shortage of minorities seeking teaching careers in science. The project is committed to identifying, recruiting, and supporting a diverse group of candidates with undergraduate science degrees (and higher), including both career changers and recent university graduates. For example, to help identify qualified applicants, the applicant partners with campus-based student organizations and governing bodies (e.g., Black, Hispanic, Native American, Veteran, and ELL student groups) as well as the NY Urban League and NYC's Sponsors for

Educational Opportunity (SEO). (pgs. 10-13)

Recruitment efforts include extensive outreach: (1) to undergraduate institutions with highly ranked geosciences programs; (2) to HBCUs, majority Black colleges, as well as highly diverse colleges in the region; (3) to professional networks for minorities in STEM fields; (4) to organizations that assist underrepresented students; and (5) through publications and websites that reach diverse student populations and/or science professionals. The applicant indicated that during the piloted programs, approximately 20% of residents in the three cohorts admitted to date have been from groups underrepresented in science education. (pgs.18-20)

**Weaknesses:**

No weaknesses noted.

**Reader's Score: 15**

**Selection Criteria - Quality of Project Design**

- 1) The Secretary considers the quality of the design of the proposed project.
- 2) In determining the quality of the design of the proposed project, the Secretary considers the extent to which the proposed project consists of a comprehensive plan that includes a description of:
  - i) The extent to which the proposed project is supported by strong theory (as defined in this notice).
  - ii) 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.
  - iii) The extent to which the proposed activities constitute a coherent, sustained program of training in the field.
  - iv) 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.
  - v) The extent to which the applicant demonstrates that it has the resources to operate the project beyond the length of the grant, including a multi-year financial and operating model and accompanying plan; the demonstrated commitment of any partners; evidence of broad support from stakeholders (e.g., State educational agencies, teachers unions) critical to the project's long-term success; or more than one of these types of evidence.

**Note:** In order to address this criterion, applicants are encouraged to develop logic models to demonstrate their project's theory of action. Applicants should connect available evidence of past history of successful outcomes to their logic models. Applicants may use resources such as the Pacific Education Laboratory's Education Logic Model Application ([www.relpacific.mcrel.org/PERR.html](http://www.relpacific.mcrel.org/PERR.html)) or the Northeast and Island's REL Skill Builder Workshops ([www.relnei.org/events/skill-builder-archive.html](http://www.relnei.org/events/skill-builder-archive.html)) to help design their logic models. In addressing this criterion, applicants are also encouraged to connect the project design to the intended impact of the project, including an explanation of how the project will affect the preparation, placement, retention, induction, and professional development of teachers, and ultimately student achievement. Finally, applicants are encouraged to discuss the role and commitment of each partner and how the IHE and LEA(s) plan to sustain their partnership beyond the life of the grant.

**Strengths:**

(i) The applicant clearly demonstrates that the proposed TQP program is grounded in strong theory. The applicant presented a comprehensive logic model aligned with goals, objectives and measurable outcomes. (pgs. 14-16) The MAT-R program includes work on the use of data to improve classroom instruction in such courses as Curriculum and Instruction for Teaching Earth Science in Secondary Schools, Developmental Variations: Development, Assessment, and Instruction with a Special Needs Focus; and Methods and Assessment of Student Science Research. In addition, the science content courses include the Earth Science Literacy Journal Seminar in which residents focus on analyzing research articles; and through the practicum and laboratory experiences, residents develop research and use data to conduct their own investigations. A hallmark of the MAT-R program is the multi-tiered system of support, assessment, and mentoring of the residents, who are guided by two mentors, who work closely together with Senior Specialists in Science and Teacher Education, who are doctoral-level science educators.

Overall, the Induction Program's five goals provide the basis for a strong theoretical program, which includes: (1) improve student science achievement; (2) accelerate new teachers' effectiveness in urban classrooms; (3) increase retention of new teachers in high-needs schools; (4) develop new teachers' capacity for reflective teaching practices and leadership roles; (5) improve new teachers' expertise in incorporating informal learning experiences and museum resources into their practices. (pgs. 17-19)

(ii) The applicant effectively demonstrates the proposed TQP training program will offer sufficient and up-to-date professional development that has the potential to lead to improvement in the teaching and learning practices of science education in the targeted schools. For example, the New Teacher Induction Program takes a multi-level approach to training science teachers. Teacher Residents and mentor teacher will have opportunities to engage in face-to-face professional development at the Museum focused on curriculum support. The professional development opportunities will be grounded in interactions with the institution's research aligned with up-to-date pedagogical content knowledge and the scientific research. (pgs. 20-23) The pairing of residency school mentor teachers and teacher residents will provide opportunities for collaborative learning and extensive preparation. Professional development will take place online and during monthly face-to-face meetings at the museum.

(iii) The applicant clearly demonstrates that the proposed TQP program is a sustainable training program with lots of promise for impacting teaching and learning in science education. The program has collaborated with high-needs partnership schools throughout the MAT pilot and the proposed project has secured partnership with four New York high-needs schools. The newly proposed program will expand the teacher residency program to add 45 new teachers to the cadre of nearly 70 who will already have completed the MAT degree with a Specialization in Earth Science. (pgs. 23-24)

The AMNH MAT-R program is a 15-month, 36-credit teacher residency program designed for optimal effectiveness in preparing and retaining highly-effective Earth science teachers for service in high-needs schools with diverse student populations, including ELLs and students with disabilities, with a significant focus on the use of data and technology. In addition to a full academic year of residency in high-needs public schools, the model includes two AMNH-based clinical summer field experiences, which is a Museum Teaching Residency prior to the school residency and a Museum Science Practicum Residency prior to entering the teaching profession. To support program residents and strengthen retention, the AMNH MAT-R includes significant mentoring, followed by a two-year New Teacher Induction Program. The year-long residency is integrated with a rigorous academic program including coursework in science and pedagogy related specifically to teaching in high-needs middle and high schools. Each of the proposed courses includes applications to the Museum and host school clinical settings to maximize development of pedagogical content knowledge. (pgs. 25-29)

(iv) The applicant effectively demonstrates that the proposed project engages in collaborative relationships with the university and the schools. The program has previously collaborated with high-needs schools throughout the MAT pilot. For the newly proposed TQP program, the AMNH now proposes to increase those partnerships to include four high-needs NY schools. The additional schools will expand the teacher residency program to add 45 new teachers to the cadre of nearly 70 who will already have completed the program with Specialization in Earth Science. The American Museum of Natural History (AMNH) has numerous longstanding partnerships with higher education institutions and extensive collaborative networks that will enrich the MAT-R program. (pg. 30)

(v) The applicant demonstrates that strategic planning conversations have taken place to secure continued funding for the innovative program. The American Museum for Natural History has a broad base of support and a long history of successful fundraising for education initiatives. The MAT-R program was specifically identified as an institutional priority in the Museum Strategic Plan. In addition to funds from private sources and from the institution, other sources of funding will be supplemented by TQP funding in 2014 and 2015 to include full support for the residency program and residents stipends from NYSED, as well as residency support and stipends for residents in 2015 from Noyce. (pg. 29)

**Weaknesses:**

(v) The applicant does not provide a sustainable plan for supporting the project after the grant period. More details regarding commitments were needed.

**Reader's Score: 40**

**Selection Criteria - Quality of the Management Plan**

**1. 1) The Secretary considers the quality of the management plan for the proposed project.**

**2) In determining the quality of the management plan for the proposed project, the Secretary considers the following factors:**

**i) 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.**

**ii) The qualifications, including relevant training and experience, of key project personnel.**

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

**Note: In order to address this criterion, applicants are encouraged to include in the application narrative a clear, well thought-out implementation plan that includes annual timelines, key project milestones, and a schedule of activities with sufficient time for developing an adequate implementation plan, as well as a description and qualifications of the personnel who would be responsible for each activity and the level of effort each activity entails. Applicants may also describe how the partnering organizations will communicate and coordinate in order to achieve project goals.**

**Strengths:**

(i) The applicant effectively demonstrates that the proposed project has developed strategic plan and procedures to oversee the implementation of the program over the life of the grant. The plan is comprehensive and clearly outlines roles and responsibilities for completing all project tasks and activities. The management aligns project tasks with milestones to benchmark the progression for completing activities, thus allowing time for refining and revising activities as needed. (pgs. 30-32)

(ii) The applicant clearly demonstrates that highly qualified and experienced educators will manage the proposed project. A Principal Investigator, who also served as a co-director of the AMNH's pilot MAT program since its inception, will carry out project oversight duties. The project will additionally utilize a collaborative project leadership team who will manage project design and implementation, induction and continued professional development, evaluation, and compliance. All of the key personnel have many years of experience and will bring a wealth of knowledge and insight to accomplishing the program's goals and objectives. For example, the co-director of the MAT pilot, is the Senior Director of Science Education and Director of AMNH's National Center for Science Literacy, Education, and Technology and has a doctorate in geology. She has 15 years of experience leading science education programs and product development at AMNH for formal and informal audiences, including those supported by NASA and NSF. (pgs. 32-33)

(iii)The applicant clearly demonstrates that multiple structures are in place to ensure continuous feedback and improvements are embedded in the program design. For example, as part of the institutional governance structure, an MAT-R Program Committee comprising of Deans, the collaborative leadership team, the PI and cross-divisional scientific and education teaching faculty members, will meet three times per year to address issues relating to faculty, admissions, student support and advisement, and curriculum. During these meeting the group will engage in continuous feedback regarding the NY Regents authorization for MAT degree-granting authority for the Richard Gilder Graduate School. (pgs. 34-35)

**Weaknesses:**

No weaknesses noted.

**Reader's Score: 20**

**Selection Criteria - Quality of the Project Evaluation**

**1. 1) The Secretary considers the quality of the evaluation to be conducted of the proposed project.**

**2) In determining the quality of the evaluation, the Secretary considers:**

**i) The extent to which the methods of evaluation provide valid and reliable performance data on relevant outcomes.**

**Note: In response to this selection factor, applicants are encouraged to include data on student learning.**

**ii) The extent to which the methods of evaluation are thorough, feasible, and appropriate to the goals, objectives, and outcomes of the proposed project.**

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

**Note: In addressing this criterion, applicants are encouraged to include a plan for how the project s evaluation will address the TQP Grant Program performance measures established by the Department under the Government Performance and Results Act of 1993 (GPRA), as well as the measures established in section 204(a) of the HEA. (The specific performance measures established for the overall TQP Grant Program are discussed under Performance Measures in section VI of this notice.) Further, applicants are encouraged to describe how the applicant s evaluation plan will be designed to collect both output data and outcome data, including benchmarks, to monitor progress. Finally, each applicant is encouraged to select an independent, objective evaluator who has experience in evaluating educational programs and who will play an active role in the design and implementation of the project s evaluation.**

**Strengths:**

(i) The applicant effectively demonstrates that an evaluation plan is in place to evaluate program outcomes. The MAT-R project's external evaluation will be conducted by the Center for Education Policy, Applied Research and Evaluation (CEPARE) at the University of Southern Maine. CEPARE was the external evaluator for the current MAT pilot program, thus indicating the evaluator has an understanding of the program's goals and potential for success. The evaluation design is central to determining the outputs, outcomes, and impacts of the teacher preparation program. The evaluation plan will be guided by the program logic model and designed to provide formative evaluation evidence relating to program improvements and summative evidence, which will include measures of success and program impacts. (pgs. 34-36)

The applicant will ensure both quantitative and qualitative evidence will be collected and analyzed. The sources of data are varied and may include, but limited to (1) administrative data (including GPRA and CAEP performance measures), (2) surveys, (3) observations, (4) interviews, and (5) document analysis. A mixed-method approach will enables the evaluators to document the complexities of the project, triangulate the evaluation evidence, provide useable and appropriate feedback to the project staff on a timely basis and evidence of success or failures. (pgs. 38-40)

(ii) The applicant provides evidence that multiple measures for evaluation will be utilized to ensure an appropriate evaluation of the goals, objectives and outcomes is accomplished. For example, the evaluation plan will gather information to inform outcomes through the following methods: (1) surveys of residents, graduates, and mentor teachers at mid-year and end-of year, and (2) surveys of other stakeholders (faculty, school administrators, etc.) annually, to elicit feedback and gauge partner involvement in program activities. (pgs. 38-39) The applicant thoroughly outlined in a table all of the proposed evaluation methods and aligned each one with outputs, outcomes and impacts. The plan effectively demonstrates that the proposed data collection methods have the potential for measuring the programs impact on preparing qualified teachers in science education.

(iii) The applicant effectively demonstrates that the evaluation procedures and progression plan has the potential to provide informative feedback and periodic assessment of progress toward achieving intended outcomes. The applicant comprehensively outlined in a table the evaluation timetable over the life of the project. (pgs.39-40) The information in the table provides adequate time for reviewing the data and projecting progress towards goals. The performance feedback will be share by the evaluators to the collective leadership team and the advisory committee in a timely manner.

**Weaknesses:**

(I) The applicant's evaluation plan is heavily detailed with quantitative data measures, the applicant may need to balance the evaluation to include more qualitative measures.

**Reader's Score: 17**

**Priority Questions**

**Competitive Preference Priority 1 - Promoting STEM Education**

**1. Projects that are designed to address one or both of the following priority areas:**

**a) Increasing the opportunities for high-quality preparation of, or professional development for, teachers or other educators of STEM subjects.**

**b) Increasing the number of individuals from groups traditionally underrepresented in STEM, including minorities, individuals with disabilities, and women, who are teachers or educators of STEM subjects and have increased opportunities for high-quality preparation or professional development.**

**Note: Applicants that respond to Competitive Preference Priority 1 and Absolute Priority 1 are still required to implement the required reforms within the whole teacher preparation program, as reflected in sections (a) and (b) of Absolute Priority 1.**

**In responding to this competitive preference priority, applicants are encouraged to include the following elements in their proposed projects:**

**1) Institutional collaboration to ensure that students in a college of education who intend to teach STEM courses have access to courses that build appropriate content knowledge. Such students should have access to course sequencing that is equal to the course sequencing for other STEM majors outside the college of education.**

**2) Emphasis on hands-on and inquiry-based STEM experiences for prospective teachers, including dedicated research or laboratory experiences, STEM discipline-specific pedagogical instruction, and explicit instruction in the interdisciplinary connections between learning sciences and STEM instruction; and**

**3) Early and multiple field-based instructional experiences for prospective teachers that are structured to provide exposure to a variety of teaching and learning environments, and that are coordinated and aligned with the teacher preparation curriculum.**

**Strengths:**

The applicant effectively demonstrates that the proposed project meets the criteria for CPP1. The Masters of Arts in Teaching Residency (MAT-R) program with specialization in Secondary Earth Science, a longstanding New York shortage area. Seizing an unprecedented opportunity to transform teacher preparation in Earth science with pilot funding from New York State in 2011, AMNH has become the only museum in the country to offer a standalone MAT program. The decision to focus on Earth science, is based on the critical shortage of certified Earth science teachers in New York State and, in particular, New York City. Earth science has been a longstanding area, with shortages reported as far back as 1999. As of 2006–07, 6.5% of science teachers in NYS and 16.5% of science teachers in NYC were not “highly qualified”; additionally, as of 2011, the turnover rate of NYC science teachers was 6% compared with 3% for NYS.

The shortage of certified teachers prevents many schools from offering any Earth science courses, thus diminishing students’ opportunities to study the subject, prepare for the NYS Regents exam in Earth science, graduate with a Regents degree, or be ready to pursue Earth science further. More generally, the shortage of effective science teachers negatively impacts student STEM achievement; research has consistently shown that improving the quality of teaching is critical to efforts to improve STEM education and achievement, which is key for the nation’s future workforce and competitiveness. (Abstract and pgs. 1-38)

**Weaknesses:**

No weaknesses noted.

**Reader's Score: 5**

**Competitive Preference Priority 2 - Implementing Academic Standards**

**1. Projects that are designed to support the implementation of internationally benchmarked, college- and career-ready academic standards held in common by multiple States and to improve instruction and learning, including projects in the following priority areas:**

- a) The development or implementation of professional development or preparation programs aligned with those standards.**
- b) Strategies that translate the standards into classroom practice.**

**Strengths:**

No strengths noted.

**Weaknesses:**

The applicant does not address CPP2.

**Reader's Score: 0**

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**Status:** Submitted  
**Last Updated:** 08/19/2014 10:48 AM



Status: Submitted

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## Technical Review Coversheet

**Applicant:** American Museum of Natural History (U336S140026)

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

	Points Possible	Points Scored
<b>Questions</b>		
<b>Selection Criteria</b>		
<b>Significance</b>		
1. Significance	15	15
<b>Quality of Project Design</b>		
1. Project Design	45	38
<b>Quality of the Management Plan</b>		
1. Management Plan	20	16
<b>Quality of the Project Evaluation</b>		
1. Project Evaluation	20	16
<b>Priority Questions</b>		
<b>Competitive Preference Priority 1</b>		
<b>Promoting STEM Education</b>		
1. CPP 1	5	5
<b>Competitive Preference Priority 2</b>		
<b>Implementing Academic Standards</b>		
1. CPP 2	2	0
<b>Total</b>	<b>107</b>	<b>90</b>

# Technical Review Form

Panel #8 - 2014 TQP Grant Review - 8: 84.336S

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

Applicant: American Museum of Natural History (U336S140026)

## Questions

### Selection Criteria - Significance

1. 1) The Secretary considers the significance of the proposed project.
- 2) In determining the significance of the proposed project, the Secretary considers the following factors:
  - i) The extent to which the proposed project is likely to build local capacity to provide, improve, or expand services that address the needs of the target population.
  - ii) The likelihood that the proposed project will result in system change or improvement.
  - iii) The extent to which the proposed project will prepare personnel for fields in which shortages have been demonstrated.

### Strengths:

i

The applicant provides a well-conceived and thorough description of the significance of the project. The project is designed to build capacity to provide support to Earth Science Teachers in high needs middle and high schools (pp1-3).

ii

The proposed project is likely to result in system change and improvement. The project plans to prepare 45 teachers to develop STEM competency(p1).

iii

The proposed project represents an exceptional approach to preparing personnel for shortages. The project is designed to establish a replicable model (p7) which will assist in the closing of achievement gaps and address the shortage of Earth Science Teachers in New York. (p8).

### Weaknesses:

None.

Reader's Score: 15

### Selection Criteria - Quality of Project Design

- 1) The Secretary considers the quality of the design of the proposed project.
- 2) In determining the quality of the design of the proposed project, the Secretary considers the extent to which the proposed project consists of a comprehensive plan that includes a description of:
  - i) The extent to which the proposed project is supported by strong theory (as defined in this notice).
  - ii) 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.

iii) The extent to which the proposed activities constitute a coherent, sustained program of training in the field.

iv) 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.

v) The extent to which the applicant demonstrates that it has the resources to operate the project beyond the length of the grant, including a multi-year financial and operating model and accompanying plan; the demonstrated commitment of any partners; evidence of broad support from stakeholders (e.g., State educational agencies, teachers unions) critical to the project's long-term success; or more than one of these types of evidence.

**Note:** In order to address this criterion, applicants are encouraged to develop logic models to demonstrate their project's theory of action. Applicants should connect available evidence of past history of successful outcomes to their logic models. Applicants may use resources such as the Pacific Education Laboratory's Education Logic Model Application ([www.relpacific.mcrel.org/PERR.html](http://www.relpacific.mcrel.org/PERR.html)) or the Northeast and Islands REL Skill Builder Workshops ([www.relnei.org/events/skill-builder-archive.html](http://www.relnei.org/events/skill-builder-archive.html)) to help design their logic models. In addressing this criterion, applicants are also encouraged to connect the project design to the intended impact of the project, including an explanation of how the project will affect the preparation, placement, retention, induction, and professional development of teachers, and ultimately student achievement. Finally, applicants are encouraged to discuss the role and commitment of each partner and how the IHE and LEA(s) plan to sustain their partnership beyond the life of the grant.

**Strengths:**

i

The proposed project is supported by theory to a limited extent. The applicant provides a logic model with inputs and outcomes(p12).

ii

The professional development services to be provided will lead to improvements in practices among teachers. The project will have implemented a 15 month residency program. The applicant provides a timeline of the project demonstrating the quality of the services to be provided. (p14).

iii

The applicant provides a vast array of services that demonstrate a commitment to a sustained program of training. Project services consist of: academic coursework, mentoring, residencies, and field work residencies. The applicant has well established partners and has attached a memorandum of understanding. The applicant describes its New Teacher Induction Program which consist of workshops, events, and mentoring. (pp20-22)

iv

The applicant has attached letters of support from its stakeholders. The applicant's partners participated in an 8 month feasibility study which informed the need for the project. The impact of the project is designed to promote achievement on the Earth Science Regents exams (p.17).

**Weaknesses:**

i

The applicant does not cite to relevant literature and research in the field that supports the utilization of project components such as mentoring, teacher residencies, etc. Further details are needed to ensure that the project services to be provided are supported by strong theory.

ii

none

iii

none

iv

none

v

The applicant does not provide a detailed sustainability plan.

**Reader's Score: 38**

### **Selection Criteria - Quality of the Management Plan**

1. 1) The Secretary considers the quality of the management plan for the proposed project.

2) In determining the quality of the management plan for the proposed project, the Secretary considers the following factors:

i) 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.

ii) The qualifications, including relevant training and experience, of key project personnel.

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

**Note:** In order to address this criterion, applicants are encouraged to include in the application narrative a clear, well thought-out implementation plan that includes annual timelines, key project milestones, and a schedule of activities with sufficient time for developing an adequate implementation plan, as well as a description and qualifications of the personnel who would be responsible for each activity and the level of effort each activity entails. Applicants may also describe how the partnering organizations will communicate and coordinate in order to achieve project goals.

#### **Strengths:**

ii

The applicant describes the background and qualifications of key project personnel. All of whom have relevant training and expertise that will lead to successful implementation of project goals. The applicant has collaborative project leadership team (pp37-39).

i

The applicant provides a timeline of key project tasks and milestones (pp39-40). The management plan is designed to promote the attainment of project goals and objectives.

iii

Performance feedback has been incorporated into project design. The applicant plans to ensure continuous improvement of the project. The applicant plans to utilize an external advisory board as a mechanism to address performance and implementation issues. (p.42).

#### **Weaknesses:**

i

The timeline does not include persons responsible for implementation. Further details are needed that delineate clearly defined roles and responsibilities for project staff.

**Reader's Score: 16**

### **Selection Criteria - Quality of the Project Evaluation**

1. 1) The Secretary considers the quality of the evaluation to be conducted of the proposed project.

2) In determining the quality of the evaluation, the Secretary considers:

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

Note: In response to this selection factor, applicants are encouraged to include data on student learning.

ii) The extent to which the methods of evaluation are thorough, feasible, and appropriate to the goals, objectives, and outcomes of the proposed project.

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

Note: In addressing this criterion, applicants are encouraged to include a plan for how the project's evaluation will address the TQP Grant Program performance measures established by the Department under the Government Performance and Results Act of 1993 (GPRA), as well as the measures established in section 204(a) of the HEA. (The specific performance measures established for the overall TQP Grant Program are discussed under Performance Measures in section VI of this notice.) Further, applicants are encouraged to describe how the applicant's evaluation plan will be designed to collect both output data and outcome data, including benchmarks, to monitor progress. Finally, each applicant is encouraged to select an independent, objective evaluator who has experience in evaluating educational programs and who will play an active role in the design and implementation of the project's evaluation.

**Strengths:**

i

The methods of evaluation provide valid and reliable performance data on project outcomes. The applicant identifies sources of data including: surveys, document analysis, observations, interviews and focus groups. The applicant provides a detailed evaluation plan with program measures and outcomes (pp43-44).

ii

The methods of evaluation are thorough and feasible and appropriate for the goals, objectives and outcomes for the project. The evaluation plan will assess the impact of program graduates on student learning. The applicant plans to collect the Annual Professional Performance Reviews for its teachers. It plans to compare the performance of its partners to other science teachers (pp45-48).

**Weaknesses:**

iii

The applicant does not provide a comprehensive description of its formative assessment component. Further details are needed to ensure that data is analyzed on a frequent and consistent basis and is used to make programmatic changes where appropriate.

**Reader's Score: 16**

**Priority Questions**

**Competitive Preference Priority 1 - Promoting STEM Education**

1. Projects that are designed to address one or both of the following priority areas:

a) Increasing the opportunities for high-quality preparation of, or professional development for, teachers or other educators of STEM subjects.

b) Increasing the number of individuals from groups traditionally underrepresented in STEM, including minorities, individuals with disabilities, and women, who are teachers or educators of STEM subjects and have increased opportunities for high-quality preparation or professional development.

**Note: Applicants that respond to Competitive Preference Priority 1 and Absolute Priority 1 are still required to implement the required reforms within the whole teacher preparation program, as reflected in sections (a) and (b) of Absolute Priority 1.**

**In responding to this competitive preference priority, applicants are encouraged to include the following elements in their proposed projects:**

**1) Institutional collaboration to ensure that students in a college of education who intend to teach STEM courses have access to courses that build appropriate content knowledge. Such students should have access to course sequencing that is equal to the course sequencing for other STEM majors outside the college of education.**

**2) Emphasis on hands-on and inquiry-based STEM experiences for prospective teachers, including dedicated research or laboratory experiences, STEM discipline-specific pedagogical instruction, and explicit instruction in the interdisciplinary connections between learning sciences and STEM instruction; and**

**3) Early and multiple field-based instructional experiences for prospective teachers that are structured to provide exposure to a variety of teaching and learning environments, and that are coordinated and aligned with the teacher preparation curriculum.**

**Strengths:**

The applicant describes its approach to promote the attainment of professional development opportunities in the STEM field. The project will produce a cadre of Earth Science Teachers. (p8).

**Weaknesses:**

None.

**Reader's Score: 5**

**Competitive Preference Priority 2 - Implementing Academic Standards**

**1. Projects that are designed to support the implementation of internationally benchmarked, college- and career-ready academic standards held in common by multiple States and to improve instruction and learning, including projects in the following priority areas:**

**a) The development or implementation of professional development or preparation programs aligned with those standards.**

**b) Strategies that translate the standards into classroom practice.**

**Strengths:**

None.

**Weaknesses:**

The applicant does not address.

**Reader's Score: 0**

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**Status:** Submitted  
**Last Updated:** 08/19/2014 10:48 AM

Status: Submitted

Last Updated: 08/22/2014 05:30 PM

## Technical Review Coversheet

**Applicant:** American Museum of Natural History (U336S140026)

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

	Points Possible	Points Scored
<b>Questions</b>		
<b>Selection Criteria</b>		
<b>Significance</b>		
1. Significance	15	15
<b>Quality of Project Design</b>		
1. Project Design	45	43
<b>Quality of the Management Plan</b>		
1. Management Plan	20	18
<b>Quality of the Project Evaluation</b>		
1. Project Evaluation	20	17
<b>Priority Questions</b>		
<b>Competitive Preference Priority 1</b>		
<b>Promoting STEM Education</b>		
1. CPP 1	5	5
<b>Competitive Preference Priority 2</b>		
<b>Implementing Academic Standards</b>		
1. CPP 2	2	0
<b>Total</b>	<b>107</b>	<b>98</b>

# Technical Review Form

Panel #8 - 2014 TQP Grant Review - 8: 84.336S

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

Applicant: American Museum of Natural History (U336S140026)

## Questions

### Selection Criteria - Significance

1. 1) The Secretary considers the significance of the proposed project.
- 2) In determining the significance of the proposed project, the Secretary considers the following factors:
  - i) The extent to which the proposed project is likely to build local capacity to provide, improve, or expand services that address the needs of the target population.
  - ii) The likelihood that the proposed project will result in system change or improvement.
  - iii) The extent to which the proposed project will prepare personnel for fields in which shortages have been demonstrated.

### Strengths:

- (i) The project improves science education for teachers through co-teaching between scientists and educators (p.e21). The project aims to increase Earth Science education, which is noted through data as a critical shortage area in New York (p.e23). What is unique about this program is that it places scientists and educators both in the role of co-teacher. This will ensure that while best teaching practices occur, a high level of rigor and authenticity will occur than if the classroom teacher taught the STEM focus alone.
- (ii) The project enables mentor teachers to learn alongside novice teachers (p.e21) to increase learning capacity in STEM areas. The mentors, who are veteran teachers, will then have the capacity to share their new knowledge with future mentees and other colleagues. These mentors are teacher leaders by the fact that they are mentoring other teachers. Many will serve in other roles of influence. This training and experience will provide them with strong practice that they will share with others and will incorporate into system improvements. This shows a very high likelihood that the program will result in system change.
- (iii) The project also incorporates methods to assist teachers in increasing content knowledge and in preparing for the NYS Regents exam (p.e23). With the advent of Common Core Standards and more rigorous expectations for science education, many of today's teachers are finding themselves unprepared. This program's blend of clinical experience with expert learning in STEM provides teachers with not only a strong pedagogical skill set, but also with an understanding of current trends and practice in STEM areas.

### Weaknesses:

None weaknesses noted.

Reader's Score: 15

### Selection Criteria - Quality of Project Design

- 1) The Secretary considers the quality of the design of the proposed project.
- 2) In determining the quality of the design of the proposed project, the Secretary considers the extent to

which the proposed project consists of a comprehensive plan that includes a description of:

- i) The extent to which the proposed project is supported by strong theory (as defined in this notice).
- ii) 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.
- iii) The extent to which the proposed activities constitute a coherent, sustained program of training in the field.
- iv) 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.
- v) The extent to which the applicant demonstrates that it has the resources to operate the project beyond the length of the grant, including a multi-year financial and operating model and accompanying plan; the demonstrated commitment of any partners; evidence of broad support from stakeholders (e.g., State educational agencies, teachers unions) critical to the project's long-term success; or more than one of these types of evidence.

**Note:** In order to address this criterion, applicants are encouraged to develop logic models to demonstrate their project's theory of action. Applicants should connect available evidence of past history of successful outcomes to their logic models. Applicants may use resources such as the Pacific Education Laboratory's Education Logic Model Application ([www.relpacific.mcrel.org/PERR.html](http://www.relpacific.mcrel.org/PERR.html)) or the Northeast and Islands REL Skill Builder Workshops ([www.relnei.org/events/skill-builder-archive.html](http://www.relnei.org/events/skill-builder-archive.html)) to help design their logic models. In addressing this criterion, applicants are also encouraged to connect the project design to the intended impact of the project, including an explanation of how the project will affect the preparation, placement, retention, induction, and professional development of teachers, and ultimately student achievement. Finally, applicants are encouraged to discuss the role and commitment of each partner and how the IHE and LEA(s) plan to sustain their partnership beyond the life of the grant.

#### **Strengths:**

- (i) An extensive literature into teacher preparation models is noted (p. e20), citing sources such as Informal Science Education Policies: Issues and Opportunities and "Proposing a Core Set of Instruction Practices and Tools for Teachers of Science." Also interesting are the numerous articles that address Finnish educational reform (Appendix H), such as "Considered Decision Making: The Development of a Policy and Practice Context Deliberately Designed to Support Quality Teaching in Finland" (p. e114), and "Miracle of Education: The Principles and Practices of Teaching and Learning in Finnish Schools" (p. e116). It is clear that the applicant invoked divergent thinking in an effort to incorporate system reforms that show promise. The application also synthesizes the literature into a coherent practice by offering best practices of co-teaching, teacher mentoring, and hands-on STEM experiences. The literature and the applicant's synthesis thereof builds an extremely strong theoretical base for the project.
- (ii) The project reflects a comprehensive design that addresses summer residencies, course sequence, and professional development activities (pp. e29-e33). Pedagogical skill acquisition is addressed with specific classes (p.e33-34), as well as clear science courses that will be an anchor point of the program that include earth science, climate, and space systems (pp.e32-33). This provides a well-rounded knowledge base for candidates as they experience field-work. Even after the coursework, candidates remain supported by mentors, who will provide them hands-on experience placing theory into practice and a collaboration partner. Clear goals for mentor selection and training strengthen the program, placing the most highly qualified individuals in these roles. What is unique about this program is that it does not focus merely upon the skills of teaching. It gives teachers additional contextual knowledge of up-to-date trends in areas of STEM. Then, once the formal coursework ends, the support of a mentor will allow the candidate to seek guidance on issues that arise through a sustained effort. The program provides a system of professional learning that continues throughout each phase of the candidate's progress, which makes the proposal for professional development extremely strong.
- (iii) Summer institutes are utilized as practicum activities that will engage the participants in hands on experiences with students and with mentors (pp. e31, e34-35). This is another example of the divergent thinking applied to the program. Candidates are provided supervised clinical experiences during summer months, an aspect most traditional programs do not provide. By the time candidates from the proposed project reach student teaching, they will have experienced a number of hands-on STEM teaching situations. This builds for them a system of prior knowledge upon which they can

pull to polish lesson design and implementation at the student teaching level. This will result in a more meaningful, authentic, and deeper student teaching experience.

(iv) The application includes descriptions of the roles that will occur between many partners, including AMNH's Richard Gilder Graduate School and Education Department (p.e46), as well as partnering with NYCDOE personnel to "embed [report card data] in induction program sessions and in a special session for mentors and host residency school staff," (p. e47). It is clear that a plan for the teaching assignment for candidates has been determined (p. e49) and will be supported by host schools. A very strong aspect of this partnership is the commitment to include one-month rotations both with ELL and special needs teachers. Such a partnership meets both the needs of the schools and the candidates, by (a) creating a base of experience from which the schools might pull in making hiring decisions; and (b) providing candidates experiences with diverse groups of students. It is evident that the project has included collaboration and meaningful input from a variety of partners.

(v): The program has already committed funds and has enlisted partners such as NOYCE to continue the project once grant funds end (p.e48). The fact that AMN has included this program as part of its strategic plan also offers the possibility that focus upon the program will continue even once USED funds end.

#### **Weaknesses:**

(iv): Specifics as to the partnership and roles and responsibilities of NYCDOE in this partnership effort are not included (p. e50). The application states, "NYCDOE commits expertise and resources related to PD for teachers, Mentors, and residents," (p. e50). Details as to exact resources and commitments would strengthen the plan and the quality of the partnership. (v): Specifics as to funding sources do not appear present in the narrative in relation to sustainability. Matching funding sources with exact amounts, percentages or efforts past the life span of the grant would strengthen the application. This would look more like a plan of sustainability that applies the commitments listed above.

**Reader's Score: 43**

#### **Selection Criteria - Quality of the Management Plan**

**1. 1) The Secretary considers the quality of the management plan for the proposed project.**

**2) In determining the quality of the management plan for the proposed project, the Secretary considers the following factors:**

**i) 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.**

**ii) The qualifications, including relevant training and experience, of key project personnel.**

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

**Note: In order to address this criterion, applicants are encouraged to include in the application narrative a clear, well thought-out implementation plan that includes annual timelines, key project milestones, and a schedule of activities with sufficient time for developing an adequate implementation plan, as well as a description and qualifications of the personnel who would be responsible for each activity and the level of effort each activity entails. Applicants may also describe how the partnering organizations will communicate and coordinate in order to achieve project goals.**

#### **Strengths:**

ii) A listing of key personnel along with their qualifications, training and experience is included (pp. e52-e57). Personnel are co-directors of current teacher residency programs, curricular centers, scientists, professors, and museum directors. All possess terminal degrees respective to their fields (Appendix F – pp. e81-e94). A review of their qualifications also evidences a wealth of experience in program administration. This will result in a well-rounded team that will make sound decisions in regards to teaching practices, content specific design, and fiscal management of the grant. The diversity of the leadership team also provides for rich collaboration, which will strengthen the program.

(iii) The plan includes the implementation of an external advisory board to refine and expand "its evaluation plan, processes, and products to include a rigorous process and plan for its continuous improvement." (p.e57). The use of the external advisory board not only provides accountability for all program leaders and partners, but provides for a periodic review of outcomes on a consistent basis. This will give program leaders the opportunity to make revisions as needed throughout the project as a result of the feedback. Using such a formative approach will better help the team stay focused upon program goals and redirect the program as needed to ensure that the project stays on track to meet its goals.

**Weaknesses:**

(i) The timeline on p.e54 is basic and lacks comprehensive detail in regards to the tasks that each individual key personnel member will undertake. The milestones (such as NYSED C3) do not appear to be aligned to direct actions of personnel. The plan should include the specific actions each personnel member will take to accomplish the goals and milestones. Each milestone should have meaningful actions that directly align to the milestone. For example, under "Review and revise current host residency school partnerships" (p.e54), activities that more directly delineate this work would strengthen the application. Tasks should be included to show what that work looks like. Examples include: "Approve host school applications by 7/15.; Receive verbal confirmation of participation from each host school by 7/15/15; Send MOUs to each host school by 7/15/15; Receive and confirm all MOUs by 8/1/15." Having such milestones and specifications would not only strengthen the application, but would also provide more clear direction to the program's key personnel.

**Reader's Score: 18**

**Selection Criteria - Quality of the Project Evaluation**

**1. 1) The Secretary considers the quality of the evaluation to be conducted of the proposed project.**

**2) In determining the quality of the evaluation, the Secretary considers:**

**i) The extent to which the methods of evaluation provide valid and reliable performance data on relevant outcomes.**

**Note: In response to this selection factor, applicants are encouraged to include data on student learning.**

**ii) The extent to which the methods of evaluation are thorough, feasible, and appropriate to the goals, objectives, and outcomes of the proposed project.**

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

**Note: In addressing this criterion, applicants are encouraged to include a plan for how the project s evaluation will address the TQP Grant Program performance measures established by the Department under the Government Performance and Results Act of 1993 (GPRA), as well as the measures established in section 204(a) of the HEA. (The specific performance measures established for the overall TQP Grant Program are discussed under Performance Measures in section VI of this notice.) Further, applicants are encouraged to describe how the applicant s evaluation plan will be designed to collect both output data and outcome data, including benchmarks, to monitor progress. Finally, each applicant is encouraged to select an independent, objective evaluator who has experience in evaluating educational programs and who will play an active role in the design and implementation of the project s evaluation.**

**Strengths:**

(i) The application includes multiple and significant qualitative measures such as interviews, document analysis and observations to measure performance (p.e59). A number of quantitative measures such as certification exam results, GPAs, teacher evaluation measures, and job placement rates are also included (p.e60). Overall student performance on Regents exams will also be utilized (p.e61). This is a multi-level approach that allows for the applicant to review quality of the program as well as its outreach and effects. Since increased student performance should be the driving force behind any teacher preparation program, the inclusion of that data is vital. When looking at the data comparatively, the applicant

will readily assess what impact the program has had on student achievement.

(iii) The strategies and measures that are outlined on page e60, which include a number of qualitative and quantitative measures such as retention rates and program completion rates will provide extensive measures that will help drive feedback and periodic assessment.

**Weaknesses:**

(ii) The project does not include specific measurable goals outside of participation numbers and qualitative measures. An inclusion of student expected outcomes would be beneficial here. Looking at that data in part (i) mentioned in Strengths will not prove beneficial to the applicant if there are no benchmarks for student performance. Examples include: "Student scores on the NY Regents exam in Science for students affected will show a 15% gain over the previous year," or "Aggregated Regent Exams scores for all students taught by residents will show a 25% gain over the course of three years." This measure is crucial for the applicant's success in properly utilizing the data it will collect under part (i) above.

**Reader's Score: 17**

**Priority Questions**

**Competitive Preference Priority 1 - Promoting STEM Education**

**1. Projects that are designed to address one or both of the following priority areas:**

**a) Increasing the opportunities for high-quality preparation of, or professional development for, teachers or other educators of STEM subjects.**

**b) Increasing the number of individuals from groups traditionally underrepresented in STEM, including minorities, individuals with disabilities, and women, who are teachers or educators of STEM subjects and have increased opportunities for high-quality preparation or professional development.**

**Note: Applicants that respond to Competitive Preference Priority 1 and Absolute Priority 1 are still required to implement the required reforms within the whole teacher preparation program, as reflected in sections (a) and (b) of Absolute Priority 1.**

**In responding to this competitive preference priority, applicants are encouraged to include the following elements in their proposed projects:**

**1) Institutional collaboration to ensure that students in a college of education who intend to teach STEM courses have access to courses that build appropriate content knowledge. Such students should have access to course sequencing that is equal to the course sequencing for other STEM majors outside the college of education.**

**2) Emphasis on hands-on and inquiry-based STEM experiences for prospective teachers, including dedicated research or laboratory experiences, STEM discipline-specific pedagogical instruction, and explicit instruction in the interdisciplinary connections between learning sciences and STEM instruction; and**

**3) Early and multiple field-based instructional experiences for prospective teachers that are structured to provide exposure to a variety of teaching and learning environments, and that are coordinated and aligned with the teacher preparation curriculum.**

**Strengths:**

(a) The application includes a clear plan of action that is STEM-based and utilizes strong scientific knowledge to incorporate strong STEM knowledge through course-based study (p.e32) and hands-on practice in STEM fields through Summer Workshops (p.e34). The program focuses both upon pedagogy and STEM specific training. What makes the program stand out is that participants will gain extensive knowledge of both pedagogy and STEM content, rather than abbreviated coursework offered in many traditional programs. STEM remains the primary focus throughout the project,

with multiple opportunities for candidates to increase their STEM experience through hands-on experience before, during, and after the actual student teaching experience.

**Weaknesses:**

No weaknesses noted.

**Reader's Score: 5**

**Competitive Preference Priority 2 - Implementing Academic Standards**

**1. Projects that are designed to support the implementation of internationally benchmarked, college- and career-ready academic standards held in common by multiple States and to improve instruction and learning, including projects in the following priority areas:**

**a) The development or implementation of professional development or preparation programs aligned with those standards.**

**b) Strategies that translate the standards into classroom practice.**

**Strengths:**

No strengths noted.

**Weaknesses:**

No weaknesses noted.

**Reader's Score: 0**

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**Status:** Submitted

**Last Updated:** 08/22/2014 05:30 PM