FINAL EVALUATION REPORT

Teacher Renewal for Urban Science Teachers (TRUST)

Life Sciences Program

A Collaborative Project of the American Museum of Natural History
Brooklyn College and Hunter College of the
City University of New York (CUNY)

Report Prepared by

Dr. David L. Silvernail
Center for Education Policy, Applied Research and Evaluation
University of Southern Maine

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EXECUTIVE SUMMARY

Teacher Renewal for Urban Science Teachers (TRUST) Life Science Program

The TRUST Life Science program was designed to extend the original TRUST professional development program into the Life Sciences. Funded with a two-year grant from the Toyota USA Foundation, TRUST Life Sciences was a partnership that included the American Museum of Natural History (AMNH) scientists and educators and two higher education institutions (Brooklyn and Hunter Colleges of the City University of New York, CUNY) that prepare new teachers for NYC schools. TRUST Life Sciences Program encompassed summer institutes, online science courses, lecture series, and Museum resources for participants and their schools. The program was designed to prepare science educators at three different levels: school supervisors selected by AMNH, science teachers at the graduate level preparing for certification from Brooklyn College, and undergraduate Biology students enrolled in a teaching track (Teaching Academy) from Brooklyn and Hunter Colleges.

The evaluation evidence from this TRUST Life Science program clearly indicates that the professional development program was very effective for the participants. Participants increased their knowledge and understanding of Life Science content, both in breadth and depth. The program successfully expanded participants' instructional strategies, both through the summer institutes and SOS online courses, and participants learned how to use informal institutions and settings to provide improved instruction to New York City students. Equally important to the success of the activities in providing professional growth for the participants is the evidence from the first cohort of the impacts of these activities on their teaching. Participants not only learned what and how to improve their teaching, they actually implemented what they learned in their instruction. The knowledge learned, and new resources acquired were used in providing Life Science content to their students, and informal learning resources were used in providing instruction.

This evaluation evidence further confirms the effectiveness of the TRUST professional development model in preparing and enhancing teachers' and supervisors' science content knowledge and instructional skills. Many participants commented on the surveys or in interviews that they would like the Museum to expand the TRUST model into other science content areas and disciplines. Thus, given the evaluation evidence, the AMNH is encouraged to design ways to expand the TRUST program for the NYC teachers and supervisors in Earth and Life Science areas, as well as other content areas.

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Teacher Renewal for Urban Science Teachers (TRUST) Life Science Program

David L. Silvernail University of Southern Maine

INTRODUCTION

This report provides summative evaluation evidence on the Teacher Renewal for Urban Science Teachers (TRUST) – Life Sciences Program. The original TRUST program was a five-year (2003-2007)) National Science Foundation (NSF) funded grant of a collaborative project between the American Museum of Natural History (AMNH) in New York City and Brooklyn and Lehman Colleges of the City University of New York. This TRUST initiative was designed to recruit, prepare and retain certified Earth science teachers and science supervisors of New York City schools.

Evaluation evidence provided in the final report (Fall 2007) of the original TRUST program indicated the model used in designing, developing, and delivering the program was very effective in recruiting and preparing Earth science teachers. In addition, several factors were deemed important to the success of the program, including the problem-centered approach used in designing the program, a clear focus on increasing teachers' content knowledge, developing ongoing professional development activities for teachers, and building continuing learning communities among teachers, and the teachers with the museum scientists and staff.

The TRUST Life Science program was designed to extend the original TRUST professional development program into the Life sciences. Funded with a two-year grant from the Toyota USA Foundation, TRUST Life Sciences was a partnership that included AMNH scientists and educators and two higher education institutions (Brooklyn and Hunter Colleges of the City University of New York, CUNY) that prepare new teachers for NYC schools. TRUST Life Sciences encompassed summer institutes, online science courses, lecture series, and Museum resources for participants and their schools. The program was designed to prepare science educators at three different levels: school supervisors selected by AMNH, science teachers at the

graduate level preparing for certification from Brooklyn College, and undergraduate Biology students enrolled in a teaching track (Teaching Academy) from Brooklyn and Hunter Colleges.

The Museum TRUST Life Sciences program was designed to have the following important outcomes:

1. The preparation of Life Science teachers for elementary, middle and high schools.
2. The increased use of Museum resources and staff by formal higher education programs for teacher candidates.
3. The socialization of Biology undergraduates into the field of science teaching and into the culture of schools.
4. The increased knowledge of content and museum resources provided to school supervisors.

EXTERNAL EVALUATION PLAN

The external evaluation of TRUST was guided by a plan which was designed to collect evidence on the four intended outcomes. To guide the evaluation a logic model was developed for the project, and this model appears in Figure 1.

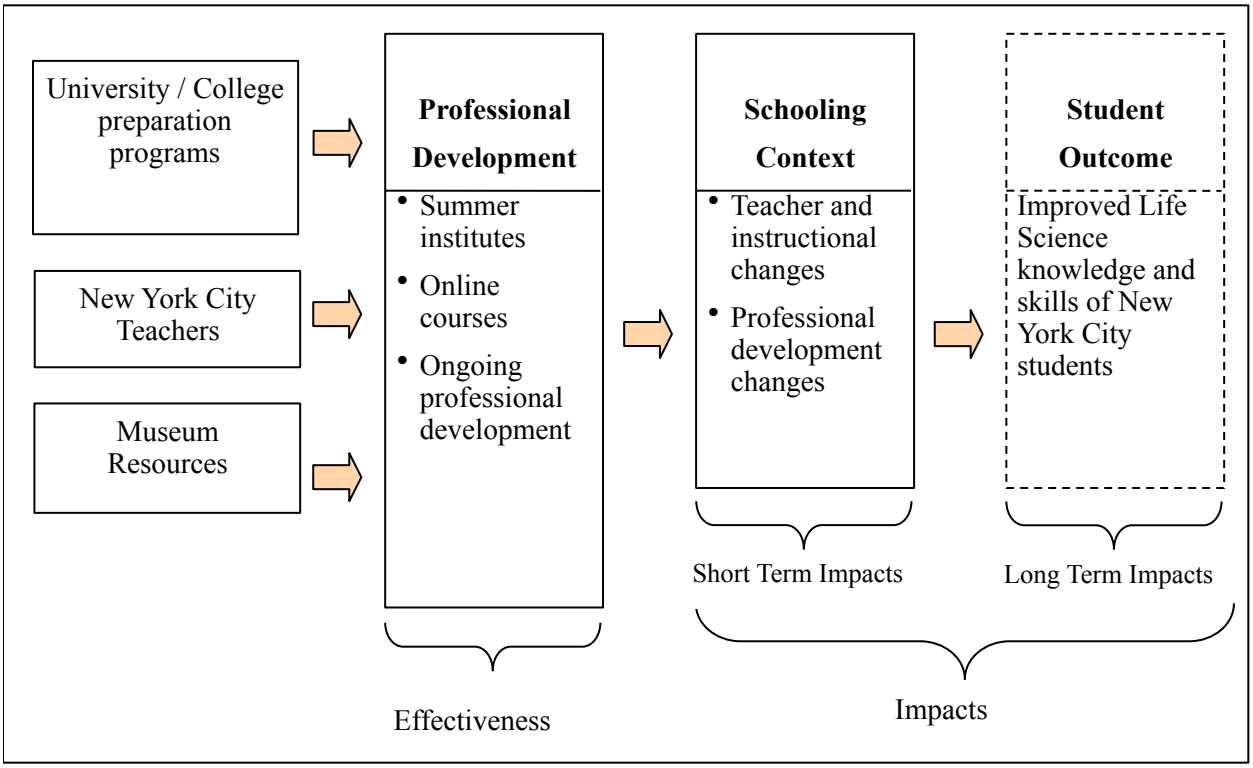

Figure 1: Project Logic Model

As may be seen from the logic model, the overarching focus of the evaluation was to determine the Effectiveness and Short Term Impacts of the project. The Long Term Impacts

were beyond the scope of the project, but the logic model reflects the assumption that effectiveness and short term impacts are prerequisite for achieving long term impacts.

To provide a comprehensive framework for the triangulation of evidence, and to increase the validity, reliability, and generalizability of findings, the evaluator used multiple methods and varied sources of data. Methods that were used over the course of the project included:

1. Surveys: Surveys were used throughout the project to assess the breadth of the effectiveness and impact of the various program components and activities. All teachers and supervisors participating in the project were surveyed after the summer institutes and one year after interventions.
2. Structured Interviews: Structured interviews were conducted with a stratified purposive sample of new teachers, administrators, education faculty, Museum personnel, and project personnel. These interviews augmented the survey evidence, and provided greater depth and understanding of how the project and its various components affected participants.
3. Observations: Observations of project activities (e.g. summer institutes, courses, participant action projects) were used in assessing program effectiveness.
4. Document Analysis: Documents produced by the project staff were reviewed for their contribution to program effectiveness.

The remainder of this report presents the evaluation evidence for this program, a summary assessment, and recommendations for future actions.

EFFECTIVENESS EVIDENCE

The effectiveness evidence was focused on three key professional development activities: (1) summer institute; (2) online courses; and (3) ongoing professional development opportunities.

Summer Institutes

Two summer institutes were conducted for two different cohorts of participants. At the end of each institute, participants completed evaluation surveys. The surveys used with the first cohort were a series of open-ended questions and prompts asking participants to reflect on what they had learned, how they had learned it, and how it helped them to be better teachers and supervisors. Typical comments, that reflected views expressed many times by participants, included these about how participants gained better knowledge about Life Sciences:

- *Every lecture was intellectually stimulating. Each focused around the essential questions of the day and was easy to follow.*
- *The lectures on Biodiversity were new and informative and enlightening. Information being presented can be interpreted and translated for classroom use.*
- *The most intellectually satisfying was that I found that I was able to understand the fundamental ideas and concept of the biodiversity and gained valuable knowledge from the teachers, educators and AMNH scientists that allowed me to share some experiences and knowledge.*
- *In the past week I have learned more about biodiversity than I have in years of formal classes. Best of all, the medium in which I learned translates directly to the classroom. This learning was not done in a vacuum or alone but as we learned, we shared lesson plan ideas and gained contacts that are priceless.*

Participants also remarked on the survey and during interviews that the institute helped them understand how the format of the institute had contributed to their learning and prepared them to be better teachers and supervisors. Typical comments included the following:

- *I found that looking at the different areas within the museum with someone knowledgeable was very interesting and taught me a lot.*
- *I found the guided tours through halls and dioramas most satisfying. Even if I was to read all of the plaques in front of the dioramas I would not get nearly the amount of info and relative material as I have from Adriana's, Lisa's, Christina's tutelage.*
- *I enjoyed learning different methods and styles of teaching.*
- *I so appreciated the close connection and availability of the staff. I have learned many ways to encourage inquiry, the importance of how the geology of an area directly relates to the Biodiversity present there. I can especially use geology to explain the Biodiversity (plant and animal).*
- *I learned how to apply my scientific knowledge (I am a bio major in undergrad studies) in a classroom setting, to students. I have learned the importance of alternate assessments and expressions to relate info and to assign projects.*
- *This experience allowed me to reconnect with different ways of teaching science in urban high schools. I appreciate being able to learn from expert lecturers and then immediately see exhibits which support important concepts.*

- *This experience reinforced my knowledge of Biodiversity and Biology as a whole and gave me specific examples to speak of/demonstrate as illustrations for various units on Living Environment course. It also was an excellent training in leading tours with students at the museum and organization of field trips.*

As may be seen from these comments, participants found the institute to be a valuable professional development activity. Participants found the organization and delivery of the institute to be most effective. As may be seen from participants' rating of the institute organization reported in Table 1, participants gave the organization of the institute high marks.

Table 1
Assessment of Institute Organization

Components	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Planning and organization of each day				16%	51%	33%
1. Responses to student questions			2%	2%	52%	43%
1. Pacing of the sessions		2%	10%	29%	36%	24%
1. Presenter(s)			3%	5%	41%	51%
1. Relevance to you and addressing your situation		5%	2%	23%	44%	26%
1. Relevance to addressing your needs as a developing teacher			2%	28%	44%	26%

Over 80% of the participants thought the planning and organization of each day was effective (i.e., rated "Effective" or "Very Effective") and over 9 out of 10 participants found the presenters to be effective and responsive to participant questions.

In terms of the institute content and resources, Table 2 reports participants' level of agreement in assessing these components. Over 95% of the participants agreed (i.e. checked the

Table 2
Assessment of Content and Resources

Components	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Faculty made difficult ideas clear				5%	52%	43%
1. Faculty showed thorough knowledge of the subject					31%	69%
1. Faculty were available for consultation and feedback				4%	33%	63%
1. The science content of the course is relevant to my development as a teacher				14%	41%	45%
1. The activities and assignments in the course helped me develop a deeper understanding of the science content				16%	41%	43%
1. The resources provided were helpful in developing a better understanding of the nature of scientific work				11%	41%	48%

"Agree" or Strongly Agree" boxes) that the museum faculty were very knowledgeable, made difficult ideas clear, and were available for consultations and feedback. And these assessments were similar for both the scientist faculty and educator faculty. Of particular note were participants' comments about how the two faculties complimented each other in supporting participants' learning. A sample of participant comments included:

- *Scientists are educators and vice versa. I learned a lot from both of them.*
- *I'm not sure who the scientist are and who the educators are.*
- *I found that both educators and scientists were in touch with how to apply learning as a teacher and as a student of science. That is to say, the scientists did not fail to mention a teaching strategy and the educators were thoroughly knowledgeable in science area.*

- *I found that the scientists are more for my learning while the educators were more helpful with things you can take back to the classroom.*
- *The scientists have the content and show their deep understanding and curiosity that drove them to their knowledge. The educators are the "linking pins" to our classrooms.*
- *I found the experience [summer institute] quite informative since I was able to explore the concept of biodiversity and evolution in rich detail. With the help of various experts who work on these topics everyday, along with the colorful dioramas at the museums itself, [I gained] a better comprehension of the topics. What I also found interesting was the different exercises that were distributed to us in order for us to conduct them with a student perspective*.

One of the undergraduate teacher candidates reported similarly about their experience:

- *The opportunity to participate in the AMNH summer institute ended up being both interesting and valuable for me as a prospective teacher. I became familiar with the layout and holdings of the museum (even in the back storage rooms where we were taken for a special tour- - I'll never forget the preserved komodo dragon!) I anticipate that this will help me better visualize how to use the museum as a teaching resource in the future. I also appreciated the ecological focus of many of the seminar presentations, which gave me ideas about how to create lesson plans that address our current global ecological crisis. The reading lists and materials provided by the organizers of the institute are also valuable resources.*

Teachers also commented multiple times that they had substantially improved their content knowledge. In Year Two of the project these self-reported improvements were assessed more systematically by asking participants to rate their levels of understanding before and after participating in the institute. Table 3, on the next page, reports these self-assessments after Week One of the 2008 summer institute, and Table 4, on a subsequent page, these assessments after the second week of the institute. Levels of understanding could range from 0 (None) to 2 (Moderate) to 4 (Very High). As may be seen from the reported averages, levels of understanding before participating in the institute trended in the moderate range (1.5 – 2.5), and trended in the High to Very High range (3.00 – 4.00) after completing the institute. Clearly, participants believed they had substantially improved their understanding of Life Science content

by participating in the institute. This evidence, combined with the evidence reported earlier about the organization and delivery of the institutes clearly indicates the institutes were an effective professional development activity.

A second professional development opportunity that was available to participants throughout the school academic school year were a series of online content courses available to the TRUST participants and to educators nationwide. Called Seminars on Science (SOS), both Brooklyn and Hunter Colleges accepted the Life Science-related courses for credit for the TRUST participants. During the first year, 13 of the total number of 35 participants (37%) enrolled in one of more of these SOS courses. While this participant rate may be considered acceptable, it was substantially below the goal the project staff had set for themselves. Thus, at the end of Year One, participants were surveyed to determine their reasons for enrolling or not enrolling in a SOS course. Reasons for non-participation varied, but two key reasons given by survey participants were lack of time and/or limited financial resources. Accordingly in Year Two, the project staff made project budget adjustments so that participants were given greater financial assistance to enroll in a SOS course. This strategy proved effective in that the enrollment rate increased to 62% for the second cohort.

Table 3
Level of Understanding Before and After the Leadership Institute

Item	Levels of Understanding	
	Before	**After**
Biodiversity is the variety of life at all its levels, from genes to ecosystems, and the ecological and evolutionary processes that sustain it.	2.29	3.50
Ecosystem diversity is determined by the interactions among species, such as predation, competition, parasitism, and mutualism.	2.52	3.43
Biodiversity has extrinsic and intrinsic values.	1.81	2.81
Ecosystem Services are the processes by which the environment produces resources that we often take for granted such as atmospheric and climate regulation, pollination, nutrient recycling, clean water, timber and habitat for fisheries.	2.24	3.33
The process of scientific inquiry includes gathering, organizing, reporting, and interpreting scientific data.	3.24	3.52
Species are surveyed through sampling and identification.	2.95	3.38
The differential distribution of species (i.e. oak species) along a transect depends on different biotic and abiotic factors.	2.24	3.24
Sustainable development is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."	2.52	3.00
The classification of biodiversity reflects its phylogeny.	1.95	2.62

Table 4
Level of Understanding Before and After the Leadership Institute

Item	Levels of Understanding	
	Before	**After**
Many thousands of layers of sedimentary rock provide evidence for the long history of the earth and for the long history of changing life forms whose fossilized remains are found in the rocks.	2.55	3.29
Molecular evidence substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched off from one another.	2.55	3.57
Major mechanisms for evolution are natural selection, sexual selection, and genetic drift.	2.71	3.43
Natural selection provides the following mechanism for evolution: some variation in heritable characteristics exists within every species; some of these characteristics give individuals an advantage over others in surviving and reproducing; and the advantaged offspring, in turn, is more likely than others to survive and reproduce. As a result, the proportion of individuals that have advantageous characteristics will increase.	2.81	3.48
The major force driving speciation is geographic isolation. Once isolated, a population can be expected to differentiate over time. Genetic variation is ever-present, and mutations become fixed through processes such as genetic drift, natural selection, or sexual selection.	2.52	3.40
The Biological Species Concept defines a species as "groups of interbreeding natural populations that are reproductively isolated from other such groups.	2.48	3.30
The Phylogenetic Species Concept defines a species as "a group of individuals with a distinct evolutionary history, which is established by the presence of one or more unique features."	1.81	3.15
If evolution is true, we should be able to reconstruct the evolutionary history in the form of a tree-like diagram.	2.43	3.45
A cladogram is a scientific hypothesis. Parsimony is one of the criteria systematists apply for choosing among alternative hypotheses. The most parsimonious hypothesis is represented by the shortest tree (the tree that required the least number of character changes along the branches of the tree).	1.57	3.05
Rather than the culmination of a linear process, humans are much better viewed as the single surviving terminal twig on a very luxuriantly branching tree.	1.62	3.20
The trait that most dramatically sets modern humans apart is their symbolic consciousness. Only humans can recreate the world using symbols and manipulate these symbols to create abstract realms of thought.	2.10	3.40

Participants who enrolled in SOS courses in the first year (Year Two participants' data not available in time for inclusion in this report) found the online courses helpful. Two-thirds reported that the online course(s) had provided a useful extension of the summer institute, and 70 percent of the participants reported that the online courses had provided them additional ideas and resources for use in their own classroom.

A third set of professional development activities were provided to the TRUST Life Science participants in the form of museum memberships, invitations to the museum lectures and seminars, and the availability of the Discovering the Universe Moveable Museum exhibit for visits to schools. Participation rates in these activities are reported in Table 5. As reflected in

Table 5
Participation in Museum Activities

1.Digital Universe Water Educator's Evening	54%		6. Chancellor's Day PD	25%
2. Lamont-Doherty Earth Observatory Open House Institute	29%		7. Discovering the Universe Program/ Moveable Museum	29%
3. Geological Society of America annual Meeting Educator's Evening	13%		8. Halls of Human Origins Sackler Education DNA Lab	33%
4. Election Day PD	33%		9. Halls of Human Origins Sackler Education Fossils Lab	33%
5. Fall Scientific Lecture Series at the Museum	29%			

the table, approximately a third of the participants in Year One indicated they participated in one of more of the professional development opportunities, and over one-half attended the Digital Universe Water Educator's Evening event. These participation rates in museum activities were considerably higher than pre-TRUST, as reported by participants.

To summarize then on the effectiveness of the professional development components of this project, they were all designed to increase teachers' and supervisors' Life Science content knowledge, to provide them new resources and ideas for use in their curriculum and instruction, and to introduce them to a wide array of informal learning opportunities. Evaluation evidence collected from participants in these various professional development activities indicate they were effective in achieving the desired goals.

IMPACT EVIDENCE

Turning to the impacts of these professional development activities, Year One participants completed an end-of-year survey designed to determine impacts (Year Two survey data will be collected at the end of the 2008-09 school years). Impacts were examined primarily in three areas: (1) use of new resources and approaches; (2) use of informal learning resources and settings; and (3) continued professional development.

Table 6 reports participants' perceived impacts of the TRUST Life Science program on their use of new resources and approaches in their teaching and supervision. The results indicate that over 9 out of 10 respondents indicated they now use museum resources in preparing and providing instruction (i.e., "Agree" or Strongly Agree"). Similarly, approximately 90% of the

Table 6
Impacts of New Resources and Approaches

Components	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
I refer to my TRUST Life Science materials for references and to prepare my lessons.	4.3%	0.0%	4.3%	39.1%	**52.2%**
Continued access to Museum resources has been very helpful to my teaching.	4.3%	0.0%	4.3%	26.1%	**65.2%**
I use essential questions as ways to organize my teaching units.	4.3%	8.7%	0.0%	**52.2%**	34.8%
I continue to keep a science journal with questions or new ideas.	4.5%	31.8%	4.5%	**36.4%**	22.7%
I now ask my students to keep a science journal as part of their science work.	4.5%	**31.8%**	9.1%	**31.8%**	22.7%
I am more confident evaluating or reflecting on my own work to improve my instruction.	4.5%	4.5%	9.1%	**59.1%**	22.7%

respondents now use essential questions in organizing and teaching their lessons. These impacts are true both for teacher participants and supervisors. Typical comments made on the survey or during interviews included:

- *I'm able to use more examples from my own experiences in the Lifes Science program. This includes the specific hands on lessons as well as questioning methods used during instruction.*
- *I have created lessons that are more inquiry based and hands on.*
- *I have become more focused on my Aim and making sure it is a research question and not a simple quick answer.*
- *I just feel more confident and less restricted in my choice of teaching style.*

Table 7 reports impacts in terms of greater use of informal learning resources.

Table 7
Impacts of using Informal Learning Resources

Components	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
I have been able to find ways to share the summer experiences with students in my school.	0.0%	0.0%	13.0%	**52.2%**	34.8%
I understand the importance of learning outside the classroom to teach Life Science.	4.3%	0.0%	0.0%	39.1%	**56.5%**
I have taken my students outside the classroom for instruction this year.	0.0%	9.1%	4.5%	40.9%	**45.5%**
I have given homework assignments that require "informal" resources such as film, NOVA series, or visits to parks or museums.	4.3%	21.7%	8.7%	21.7%	**43.5%**
I feel that I can now use the Museum and local parks for instruction in Life Science.	4.5%	0.0%	0.0%	45.5%	**50.0%**

Almost all of teachers and supervisors indicated that one of the major impacts of the program has been to increase their understanding of the importance of learning in informal settings. And more importantly, they have acted on their increased understanding. Between 80 - 90% of the respondents reported using the museum and parks in their teaching, and approximately two-thirds reported assigning student projects that required the use of informal learning resources. Teachers remarked:

- *TRUST has had a big impact in my instruction with regard to activities and using the museum as a resource.*
- *I am more likely to look for outside resources when giving references to students or to point students in that direction when asking them to find references.*

- *I have use the activities and modules introduced during the TRUST program to create lesson plans that were relied on real time data and issues that are current in science.*

In the case of impacts of the program on participants' own professional growth, participant self-assessments are reported in Table 8. Between 70-80% indicated they felt more confident in reading science reports and journals, and in providing professional development sessions for colleagues.

Table 8
Impacts on Own Personal Development

Components	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
I feel more confident about reading scientific reports, journals, or seeing scientists in my TRUST courses and institute.	4.3%	17.4%	8.7%	39.1%	**30.4%**
Continued opportunities for professional development through participation in museum activities have been very helpful to my teaching.	4.3%	0.0%	4.3%	43.5%	**47.8%**
I have felt more confident to do professional development sessions for my school or region after TRUST.	0.0%	4.5%	18.2%	36.4%	**40.9%**
I have taken personal trips or gone on local outings to deepen my own knowledge of Life Science.	4.3%	4.3%	8.7%	30.4%	**52.2%**
I would like to stay involved with the TRUST program so I feel I am in a community of people with resources and common interests.	4.5%	0.0%	0.0%	27.3%	**68.2%**

Typical comments were:

- *I feel more confident in areas that I felt I was weak in. I also have great resources (the books given during TRUST) to help answer questions and create lessons.*
- *I am more confident and knowledgeable teaching about biodiversity and evolution.*

And almost all participants, teachers and supervisors alike, see their continued involvement with the museum and the scientists as important to their teaching and professional future professional growth.

SUMMARY EVALUATION

In summary, the evaluation evidence from the TRUST Life Science program clearly indicates that the professional development program was very effective for the participants. Participants increased their knowledge and understanding of Life Science content, both in breadth and depth. The program successfully expanded participants' instructional strategies, both through the summer institutes and SOS courses, and participants learned how to use informal institutions and settings to provide improved instruction to New York City students. Equally important to the success of the activities in providing professional growth for the participants is the evidence from the first cohort of the impacts of these activities on their teaching. Participants not only learned what and how to improve their teaching, they actually implemented what they learned in their instruction. The knowledge learned, and new resources acquired were used in providing Life Science content to their students, and informal learning resources were used in providing instruction.

This evaluation evidence further confirms the effectiveness of the TRUST professional development model in preparing and enhancing teachers' and supervisors' science content knowledge and instructional skills. Many participants commented on the surveys or in interviews that they would like the museum to expand the TRUST model into other science content areas and disciplines. And the partnership with CUNY colleges proved very beneficial for the colleges. As one CUNY division chair reported:

- *The TRUST life summer institutes helped the Science Education program at Brooklyn college to expand our institutional partnership with the museum to benefit teachers of Life Science, using the unique intellectual and tangible resources of the American Museum of Natural History. For the past five years Brooklyn college School of Education, Department of Geology, and the AMNH have offered summer institutes to teachers of Earth Science with funding from the National Science Foundation. These institutes served as a foundation for the development of an entirely new 30-credit program in Teaching Earth Science focusing on teaching with local cultural and natural resources beginning in 2009. The TRUST Life Summer Institutes have served as a similar core for an emerging partnership for the preparation of Life Science teachers. The Brooklyn College School of Education and the Department of Biology anticipate a new program in Teaching Life Science beginning in summer 2009, in partnership with the New York City Department of Education Teaching*

Fellows program. This alternative certification program will feature elements of the TRUST Life program including the summer institute and the online Seminars on Science courses. From the perspective and participants in TRUST Life, , the experience provided a deep introduction to evidence for and methods of teaching about Evolution and Biodiversity that successfully enabled teachers from diverse religious backgrounds to teach evolution to similarly diverse student populations. For most participants in TRUST Life, this was the first exposure to concepts in evolution from an evidence-based perspective. The TRUST Life Summer Institute in conjunction with the online Seminar on Science provided participants who were initially certified in teaching Physical Sciences with the core knowledge in Biodiversity, Ecology and Evolution to teach the Life Science component of the New York City Spiral Curriculum and inspired a number of Elementary School teachers to continue study in Biology to become certified to tech Life Science. Brooklyn College is grateful to the Toyota Foundation for supporting this initiative.

Thus, given the evaluation evidence, the museum is encouraged to design ways to expand the TRUST program for the NYC teachers and supervisors in Earth and Life Science areas, as well as other content areas.