Staff Reply
Committee of Visitors Report
for the
Teacher Professional Continuum (TPC) Progam

**PART A.   INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND
           MANAGEMENT**

*A.1 Questions about the quality and effectiveness of the program's use of merit review
procedures.*

Is the documentation for recommendations complete, and does the program
officer provide sufficient information and justification (a) for her/his
recommendation? (b) for the Principal Investigator(s)?

Beyond the headings of intellectual merit and broader impact, there seems to be little
standardization of headings and information reported across the Review Analysis reports
examined. It is recommended that in addition to intellectual merit and broader impact,
other headings in the Review Analysis reports for all projects be standardized.

> **NSF Response: The comment is true that we don't require a rigid
> standardization of headings. We have thought about imposing
> such standardization, but that would hobble a Program Officer's
> creativity. We do require that all review analyses mention
> conflicts of interest if there are any, whether or not any reviews
> are in conflict with the overall recommendation, etc., but we don't
> dictate that these comments be in any specific order or that they
> have to be mentioned even when they aren't an issue. We want to
> avoid turning the review analysis into a "fill in the blanks"
> exercise. Additionally, panelists will be reminded that the panel
> summary should be a synthesis of the panel discussion rather
> than a simple duplication of individual reviewers' comments.**

The nature of the justification provided to Principal Investigators of non-funded proposals
was not discernable because letters to these PIs were not accessible through eJacket.
"Proposal Decline Letter" hot buttons are not active and result in "Eletter access failure"
messages.

> **NSF Response: It was unfortunate that COV members could not
> see the letters to the PIs. Generally, those proposals considered
> to be "high declines" (competitive, but below the quality for which
> funding is available) receive information from the Program officer
> by way of a PO Comments letter, in addition to the context**

statement letter that all declinations receive. PO Comments typically provide PIs with ample information regarding the reasons for their proposal's declination.

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Have the individual reviews (either mail or panel) addressed both merit review criteria?

With respect to broader impact, all reviews sampled did address the potential impact the proposed work could have on policy, research, theory, and practice in the field of education. Reviewers might be reminded to include potential effects for underrepresented groups.

> **NSF Response: Reviewers will be reminded to consider the issue of broadening participation (e.g., gender, ethnicity, disability, geographic, etc.) as part of the overall examination of the broader impacts criterion.**

Additional comments with respect to implementation of NSF's merit review criteria:

In the review structure it may be useful to ask reviewers to comment about positive and negative aspects of the proposed project separate from and in addition to the project's intellectual merit. This would ensure that the importance of problems addressed would be identified as well as issues and problems that might undermine its potential contribution.

> **NSF Response: This is a good suggestion, and reviewers will be reminded in the future that addidtional commentary about the merit of a proposal can be expressed in Part B and Part C of the Report Template.**

A.3 Questions concerning the selection of reviewers.

Did the program make use of reviewers having appropriate expertise and/or qualifications?

Approximately 65% of TPC reviewers between 2003-06 were academics from universities and colleges (of which roughly 1.5% were from community colleges), but many other organizations have been represented including schools and school districts (15%), and museums, independent R&D organizations, individual consultants, and professional associations (17% combined). This is a strong and diverse range of qualifications and backgrounds. Only one reviewer from the business community was included in any panel during this 3-year period.

NSF Response: It is to be expected that representation from the business community would be small, but admittedly having only one reviewer in three years is too small. Program Officers will be advised to make stronger efforts to engage reviewers from the business community.

A.4 Questions concerning the resulting portfolio of awards under review.

Are awards appropriate in size and duration for the scope of the projects?

Projects that were funded for longer periods and at higher levels generally correlated with a larger scope of promised activities. For NSF, a meaningful measure of the connection between size, duration and scope would be to look at the extent to which projects actually met their timelines for various activities. In looking at the TPC project evaluation planned by Abt Associates, it seems they are looking at the intended scope of activities, not at what was actually accomplished. *The COV recommends that Abt Associates be asked to also look at the connection between actual scope of accomplished project activities and what was promised in the original proposal.*

NSF Response: This is a good suggestion. We will make this recommendation to Abt Associates.

Does the program portfolio have an appropriate balance across disciplines and subdisciplines of the activity and of emerging opportunities?

In its mission and goals, the TPC program does not seem to lend itself to projects focusing on emerging technologies. Indeed, there seem to be very few projects taking advantage of emerging technologies. The COV found three: 1) a proof of concept project promoting and investigating teachers' use of digital libraries in classrooms (0554440); 20 a proof of concept project investigating Internet2 as resource for PD for middle school teachers (0455784); and 3) full research project investigating how teachers use full wireless environment in high schools (0455795). In its mission and goals, the TPC program doesn't seem to lend itself to projects focusing on other emerging opportunities.

NSF Response: Program Officers have been disappointed by the limited number of proposals that intend to focus on emerging technologies. Currently, program officers are discussing ways to orient both reviewers and PIs to think about the classroom of the future, not necessarily the classroom of today.

PART B. RESULTS OF NSF INVESTMENTS

B.1 OUTCOME GOAL for PEOPLE: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."

Well-prepared citizens. Technology projects are developing potential technologists and well prepared citizens – those that become comfortable with the use and integration of technology in daily life. It is not always clear what NSF and EHR mean by technology – technology education, educational technology, technology in the service of science or careers in technologies that impact the quality of human life (the new vocational education). This later career technology education should not be lost among the many other variations of technology as such approaches to technology are important to the economy of communities.

> **NSF Response: This is a valid concern. Technological education and educational technology are two very different things to science education professionals. Certainly, technology education, technology in the service of science, and careers in technologies that impact the quality of human life are important. However, the TPC program did not receive very many proposals that deal with these areas, and therefore the number of awards has not been great. We acknowledge that greater effort is needed to encourage proposal submissions in these areas.**

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The TPC Program was short-lived, emerging from previously identified needs and merging into a new organizational structure after a mere three years. It would be useful if a future COV could review what actually happened as a result of the funded projects and their effectiveness, as this information was not available to this COV.

> **NSF Response: There are no plans to conduct another TPC COV. However, there will be a DR K-12 COV in 2010 or 2011. That COV would be interested in the history of the DR K-12 program, and some of the outcomes would be informative to that committee, just as some of the outcomes of the Teacher Enhancement program were useful to the TPC COV.**

It would be important for NSF/EHR to fund some follow-up studies to determine if the projects actually did what they promised and what could be learned from the project that has wider application to PreK-12 STEM teaching and learning.

NSF Response: Assessment of impact of TPC investments will be a part of the broader third-party evaluation undertaken by Abt Associates.

Most of the projects funded use typical modes of dissemination – articles, websites, and conference presentations. It would be useful if NSF could sponsor some additional ways to disseminate the new knowledge and resources produced by TPC. This is especially true of the more recent projects which are developing models of teacher preparation and ongoing professional development and of resources for professional development.

*NSF Response: Program Officers would support the idea of a dissemination vehicle for deliverables produced by TPC projects (and from other programs as well).

While current proposals require PI's to list current funding and results of previous funding and to include an introduction that focuses on existing knowledge, this COV feels that PIs should be required to check what materials are already available (produced by previous funding by NSF and other sources) and to detail how their work is different from or builds on that of other researchers and developers.

NSF Response: Reviewers and Program Officers are usually quick to identify proposals that have not researched what resources are already available or what research projects have already been done. However, it might be a good idea to specifically remind PIs to conduct a thorough background literature search before submitting a proposal.

As would be expected, the members of this COV have participated in other NSF activities as awardees and reviewers. We believe that there is much high quality knowledge and many resources that do not become well-known to the many stakeholders in PreK-12 STEM education and would urge NSF to consider ways that they, not just PI's, could disseminate information.

NSF Response: (See response above indicated with a *)

We also believe that NSF is the proper venue to support studies of PreK-12 STEM teaching and learning and urge NSF to consider ways to support cross project studies, similar to meta-analyses.

NSF Response: We will discuss the possibility of cross-project studies in the coming year.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

From the solicitation, and the increased precision of focus in the solicitation, it is clear that the TPC provided funding for research and resources at specific points on the STEM Teacher Professional Development Continuum but not the continuum as an entity. The members of the COV wonder if a review of the TPC Projects (and some the precursors) might begin to trace the placement of these points and the connections between them. This could lead to the development of teacher learning trajectories, similar to work being done to trace student learning trajectories. Several projects address a learning progression but do not link to other programs on learning progressions that NSF has funded.

NSF Response: The development and study of teacher learning trajectories is an important issues—and one that we will discuss in the future.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

The COV recognizes the attempts by NSF to balance stability of personnel and the regular introduction of fresh ideas that come with rotating personnel. This program seems to have an exceptionally high degree of changing personnel.

NSF Response: The high degree of turnover in leadership was exceptional. However, each section head was selected from among the Program Officers already working in the TPC program, so transition was usually smooth each time it occurred. As the COV members pointed out in section A.5.1, management of the program was successful in spite of the high turnover.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

The report template should be reviewed for clarity. The COV understand the reality of a Foundation-wide template, but some questions seem to be inappropriate for the education projects – research, knowledge development and resource development. Program specific clarification, such as in this case what would constitute a high-risk project, made available prior to commencement of the meeting would be helpful.

NSF Response: This is a common criticism of EHR COV committees. If EHR could develop its own COV template that differed from the one

required by all of the NSF directorates, many of the questions would be more appropriate and relevant.

This COV understands that we were the first in EHR to do a review using the electronic jackets and database. The TPC Program staff provided us with much information and access to these materials well ahead of time. However, the ejacket and database were new to us and we had a steep learning curve to develop ease and precision of use. This learning curve will likely decrease as more people use the ejacket and database. A web conference with COV and Program Officers would have been helpful along with instructions from the COV chair (assignments, focus areas, etc.) Given human nature, despite all the information in advance, many of us did not delve into the task until immediately before the meeting convened. A web conference might have forced earlier engagement. Similarly, a conference call might have been useful, but only if COV members were at a computer to access the database.

NSF Response: The web conference is an interesting idea. We have instituted such conferences for reviewers prior to review panels with great success. The creation of a secure IT architecture under which COV members can access the NSF database would enable us to utilize web-based processes to a greater extent. In the future, we will be looking in this direction.