

## **Response**

### **To the Committee of Visitors (COV) Report**

#### **Graduate STEM Fellows in K-12 Education (GK-12) Program**

COV Meeting of June 21-22, 2011

The GK-12 program staff thanks the Committee of Visitors for their time, dedication and effort to review the program and to provide helpful comments and recommendations to the GK-12 program. The program staff appreciates the commendations and overall positive review of the program. Because GK-12 is scheduled for termination in FY2012 and no new competitions are expected, general responses are provided regarding the merit review process and selection of reviewers. More specific responses are provided regarding the management of the program.

#### **INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT**

##### **I. Quality and Effectiveness of Merit Review Process**

###### **Summary of COV Comments/Recommendations:**

Overall, the review methods and panel reviews were very appropriate for the program with opportunities to seek new reviewers (if necessary). The materials provided to reviewers were impressive and very detailed. The instructions to reviewers were thorough.

Despite best attempts of the Program Officers to train reviewers, there was still a lot of variation in the depth of analysis. While the Program Officers are making a strong effort to encourage more thorough reviews, ways to identify those lacking in thoroughness may be appropriate. This issue is probably not limited to this program and could be NSF-wide or present in many situations involving peer review. The Program Officers are to be commended for the steps they have taken to address this issue.

The summaries took the best of the individual reviews and also reflected the conversations that must have gone on about the proposal. Program officer review analysis was quite thorough and supported the decisions that were made. The Program Officers also did a nice job of trying to offer constructive comments on declined proposals.

There is a great deal of evidence in the COV portfolio that the Program Officers have been very responsive to the comments of the previous COV about the merit review process.

The sketchiness of some of the reviews may be a result of too heavy of a workload on reviewers. Decreasing the workload on each panelist might increase the overall quality of the reviews.

We commend the program officers for providing more details to the reviewers in an attempt to elicit better reviews (including what constitutes intellectual merit versus broader impact). We found evidence of this responsiveness in the materials we reviewed. More webinar training for reviewers (including examples of good/helpful and bad/unhelpful reviews) should be considered in the ongoing effort to generate better reviews.

Response:

*The GK-12 program staff appreciates the positive comments of the COV regarding the merit review process. The unevenness on the quality of the reviews has been a constant challenge for the program even when reviewers were assigned a smaller number of proposals. We agree with the COV that this issue may not be limited to GK-12 and it may be NSF-wide. Including examples of reviews in webinars might be helpful especially to less experienced reviewers. Another strategy that has been used to increase the quality of reviews is to monitor the reviews online as they come in, but this requires that reviews be submitted several days prior to the panel meeting.*

## **II. Selection of Reviewers**

### **Summary of COV Comments/Recommendations:**

Assessing a GK-12 proposal is a complicated endeavor because it involves a lot more than simply judging the scientific merits of the proposal. The increase in the complexity of proposals necessitates a larger base of reviewers. University faculty are required to evaluate the technical nature of the proposal and K-12 faculty are now participating to evaluate the effectiveness of the K-12 interactions.

Based on the evidence we were given, there was a breadth of expertise in the review panels. It is commendable that reviewers from the K-12 sector are involved.

More reviewers with expertise in educational program assessment and the social sciences would be valuable.

Also, because race and ethnicity are self-reported by panelists, there was not enough information to judge the extent to which panels were racially diverse.

Response:

*The GK-12 staff agrees with the COV that GK-12 proposals are complex to review because of the nature of the program. Efforts were made to include more social scientists as reviewers in spite of receiving a small number of proposals in the social sciences. The staff agrees with the COV that more panelists with expertise in educational assessment would have been of value.*

*The data provided to the COV on race and ethnicity were those self reported by panelists. However, GK-12 staff made great efforts over the years to have panels as diverse as possible with respect to gender, ethnicity, and race. In general, a minimum of 20% of panel members were from underrepresented minorities. In 2009, 32% of the panelists were underrepresented minorities; in 2008, the percentage was 38%. The GK-12 program believes this is a remarkable record.*

### **III. Management of the Program under review**

#### **1. COV Comments/Recommendations on Responsiveness of the program to emerging research and education opportunities:**

GK12 projects are interdisciplinary and tend to focus on research areas that are relevant to and of interest to the public. One of the concerns of the previous COV was a much greater number of funded projects in biology-related areas compared to other STEM disciplines. The move to a greater focus on interdisciplinary themes related to science and engineering grand challenges and societal needs is quite commendable.

The program also is producing a cadre of well-rounded scholars, many of whom are publishing both in their content areas and in education journals. There are very few, if any, other programs funded by the NSF that can say they have made such an impact on our universities.

Overall, we do not feel that the international program added much to the GK-12 program. While having an international research experience can be a personally catalytic experience, this seems to stray from the main mission of the GK-12 program and might best be funded elsewhere. The comments made by the previous COV in this regard are still valid and the question of whether this should be a core activity of the GK-12 program is still open.

Response:

*The GK-12 staff has also been pleased with the expansion of interdisciplinary projects and with the accomplishments of funded Fellows. Regarding the international component of the program, the idea has always been to provide additional opportunities for projects rather than becoming a core of the program. Because many interdisciplinary projects are global in nature, we view the connection of U.S. graduate Fellows with foreign scientists as a positive element.*

**2. COV Comments/Recommendations on program planning and prioritization process that guided the development of the portfolio:**

The portfolio of the program continues to be quite impressive and reflects excellent vision and management. Nonetheless, we are aware that the decision has been made to discontinue the program in its present form.

A challenge noted by the COV is where else within NSF the work of the GK-12 program could be done in the future. Since the goals and vision of the program are still very critical and are consistent with NSF's overall strategic plan and the national interest, NSF should be seeking ways to continue the major elements of this program in other directorates and Foundation-wide programs. The needs that led to the establishment of this program remain pressing.

It is also important to note that the GK-12 program has created a unique environment for training of graduate students that is not present in any other NSF traineeship program. The concern is that this environment will be very difficult to duplicate without the organized joint university-community effort that is catalyzed by this program.

Response:

*The GK-12 staff agrees with the COV that continuing the major elements of the GK-12 program is important for the NSF and for the nation. Program staff is working on identifying best practices for different areas of the program. A workshop in the fall of 2011 will take place to involve project representatives in this endeavor. A draft of a handbook on best practices will be the result of the workshop. This draft will be shared with the larger GK-12 community for further input and will be published online to serve as guidance for those who would like to continue GK-12 best practices.*

*Representatives from Foundation-wide programs will be invited to the GK-12 2012 annual meeting to explore ways other NSF Directorates and Offices might include some of the learning and practices of GK-12 into other programs.*

**3. COV Comment/Recommendations on responsiveness of program to previous COV comments and recommendations:**

The program was highly responsive to the previous COV comments and recommendations and has provided detailed information to the reviewers on the reviewing process.

There have been 25 site visits made since the last COV. This is certainly a positive development. A template for those site visits and two examples of site visit reports were provided to the COV.

It is commendable that Einstein Fellows have been integrated into the site visit team.

Two of the stated goals of the GK-12 program are diversity and transformation of graduate programs. Neither of these two goals were mentioned in the template. Given the importance of these goals, they should appear on the template.

Response:

*The GK-12 program will continue conducting site visits to projects and will continue including an Einstein Fellow in these visits. A challenge will be the limited funds available for conducting site visits. We agree with the COV that diversity and transformation of graduate programs should be included in the site visit template, and we will add them for future site visits.*

**IV. Portfolio Review**

In general, the program has achieved many of its goals but there remains a question of sustainability for many of the program's accomplishments. In particular, the COV notes the difficulty of achieving widespread infusion of GK-12 program elements across all STEM disciplines on host campuses. The application format and protocol should require information about institutional mechanisms for achieving sustainability in post-initiative phases. An absence of programmatic activity designed to achieve such aims has an impact on all STEM graduate student training.

Response:

*The GK-12 staff agrees with the COV that sustainability remains a challenge for many projects. Even though sustainability was an element required in the proposal, infusing GK-12 elements on a campus-wide basis and sustaining the efforts after the grant expires is difficult to attain. However, the program is identifying projects that have been successful at sustaining some practices to serve as models for existing projects. Lessons learned will be included in the handbook referenced above.*

## **OTHER TOPICS**

### **1. COV Comments/Recommendations on any program areas in need of improvement or gaps within program areas:**

- There seems to be little programmatic activity to leverage GK-12 to improve training of all STEM graduate students.
- Templates for proposals, site visits, and reviews, as well as standards for summaries, should all reflect the program's specific objectives.
- Specific professional development goals for K-12 teachers should be formulated.
- In reading over the reviews, the efforts to increase diversity were often mentioned and diversity efforts were viewed as an important ingredient in the review process. However, achieving diversity is quite another matter. The Abt Associates report shows only a modest percentage of minorities participate as fellows in this program, indicating that academia still has not been able to seriously address diversity issues.
- In reading over the annual reports, it appeared that some PIs did not address diversity issues. Though the checklist that is used by NSF Program Officers asks for the race/ethnicity of participants, it does not have a category for diversity issues. Perhaps the checklist can be changed to reflect the importance of diversity and recruitment efforts of the project. There might be other categories that should be included, like evidence for the transformation of the graduate program.

### Response:

*GK-12 staff agrees that templates can be modified to reflect program goals and diversity issues. Regarding the percentage of minorities participating in the program, the Abt report indicates that 14% of former Fellows and 15% of current Fellows were minorities. These numbers are higher than the percentage reported nationally for science doctorates awarded to U.S. citizens and permanent residents in 2005 (10%). There is also wide variation in the percentage of minorities in individual projects as reported in the NSF/AAAS recent publication: "The NSF GK-12 Program: A Decade of Innovation in Graduate STEM Training and K-12 Learning." The GK-12 staff agrees that more efforts are needed in academia to address diversity issues. The COV recommendation on professional*

*development goals for K-12 teachers can be addressed in the aforementioned handbook.*

**2. Comments/Recommendations on the program's performance in meeting program specific goals and objectives that are not covered by the above questions:**

A primary goal of the GK-12 program is to enable STEM graduate students to "bring their leading research practice and findings into K-12 settings." Evaluation data provided in the November 2010 Abt Associates summary report indicate that GK-12 is meeting this goal and accomplishing the key NSF objectives for this program. Performance is weakest with respect to institutionalization and diversity.

*Response:*

*Issues regarding institutionalization and diversity were previously addressed in the program responses.*

**3. Comments/Recommendations on agency-wide issues that should be addressed by NSF to help improve program's performance:**

- Given the decision that has been made to terminate the GK-12 program, an important issue for the NSF is how to either create a follow-on program or incorporate the unique benefits of the GK-12 program into other programs or Foundation-wide efforts.
- Initiatives such as IGERT and GK-12 are developed to achieve special outcomes. Before termination decisions are made, it should be clear that program goals have either been accomplished or that plans for imbedding them in Foundation-wide programs have been developed.

*Response:*

*Program staff is exploring ways to identify and incorporate some GK-12 elements into other NSF programs. NSF considers many factors in making the decision to terminate a program, but, as suggested by the COV, is re-evaluating the process for making these decisions as well as providing greater transparency of the basis for these decisions to the community.*

**4. Comments/Recommendations on any other issues the COV feels are relevant:**

The overlap of the GK-12 and IGERT COVs is commended and promises to draw out possible synergies between these two traineeship programs.

**5. Comments/Recommendations on how to improve the COV review process, format and report template:**

- Very little guidance on the project management aspects of this process were provided prior to this COV convening at NSF. More attention should be given to this aspect in following COVs with the idea of working from best practices.
- The amount of information that the COV is to process is immense. When this information is initially sent out, some kind of plan should be sent along with it to give more details about the best way to tackle the process — including a way to prioritize material review.

Response:

*These are excellent suggestions to be taken into account for future COV meetings for GK-12 and transmitted within NSF so that other COVs may benefit.*