

NSF RESPONSE TO COV REPORT

RESEARCH ON GENDER IN SCIENCE AND ENGINEERING

Human Resource Development
Education and Human Resources

Committee of Visitors of September 10-11, 2009

In response to the COV report submitted by the Committee of Visitors (COV) for the Research on Gender in Science and Engineering (GSE) program, GSE staff has prepared the following responses to issues raised by the COV team.

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

A.1 MERIT REVIEW PROCEDURES

1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?

"The COV recommends that GSE allocate funds in the budget to cover site visits as well as reverse site visits."

The GSE program does not conduct site visits to the Extension Service Projects because in many cases there are no sites, per se, to visit. Extension Service Projects are designed to reach out to practitioner communities, and for the most part activities take place in far flung locations rather than on a "campus" or "location" that would be conducive to a visit. Taking a site visit team to one of the training sessions might be an option, but the disruption such a team might produce would be counter to the training objectives and might not yield useful information. The reverse site visit allows for teams from the project to present material in a comprehensive manner and for dialog between the site visit reviewers and the project teams. Evaluators are always included to supply evaluation data and insight. It has worked well for the program and has led to significant project redirections when necessary. The program officer does travel to the training sites for the various Extension Service Projects. The program officer will continue this practice and perhaps extend this activity to include site reports from these visits to be uploaded into the jackets.

MERIT REVIEW CRITERIA

2. Are both merit review criteria addressed

"It is the Committee's position that the question of whether or not both criteria are addressed is not as meaningful today as it was fifteen years ago when the dual criteria were not as well established in NSF policy and procedure...The Committee recommends that the NSF consider what merit review criteria-related issues it now wants to address and to formulate a new question or series of questions that would facilitate a more substantive

assessment of how individual reviewers, panels, program officers, and even PIs address intellectual merit and broader impacts in the context of proposals."

The GSE program will consider adding questions to the next COV template that would attempt to capture nuances involving the two merit review criteria of particular importance to the program.

3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?

"Individual reviewers consistently provide more extensive and varied comments on the strengths and weaknesses related to a proposal's intellectual merit than those related to broader impacts...The COV challenges the NSF to revisit how intellectual merit and broader impacts are considered and weighted across NSF programs and for projects within individual programs."

Because the GSE program is focused both on excellent research and broadening participation in science, intellectual merit and broader impact assessments are often intrinsically intertwined. Frequently reviewers experience some difficulty deciding what should be included in intellectual merit and what in the broader impacts fields. The program does offer some guidance on this, but inevitably issues that could be addressed under both intellectual merit and broader impacts are included in the first section (intellectual merit) and not reiterated under broader impacts. Thus, the impression might be that one or the other is given more weight in the review. This is not necessarily the case, however, and the program officer will make greater efforts to ensure that reviewers and panelists separate intellectual merit and broader impacts criteria in the reviews and panel summaries to better reflect the weight each received in the decision making process.

4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?

"...the COV finds that the panel summaries are less effective as a means of providing rationale for consensus (or lack thereof) than for summarizing the individual views of panel members... The COV feels panel summaries sometimes default to covering all comments about intellectual merit and broader impacts without providing a true and clear rationale for a proposal's rating."

The program agrees that panel summaries are not always explicit about the specific criteria the panel members use to place a proposal in the "highly recommend," "recommend," or "do not recommend" categories. The program officer will adjust panel orientation materials to reflect the necessity of capturing not just the complete panel discussion, but also the reasons for placing proposals in a specific recommended category.

7. Is the time to decision appropriate?

"The COV suggests that GSE program staff monitor dwell times in FY2009 and FY2010 to see if this trend [of longer dwell time rates] continues. If it does, then the COV recommends that an effort be made to ascertain the cause(s) and find appropriate solutions to resolve or reduce their potential negative impact on dwell times."

The program staff will continue to monitor dwell time rates to ensure that the program remains within the seventy percent NSF goal of processing proposals within six months. The program will strive to decrease dwell time across the three tracks.

A.2 SELECTION OF REVIEWERS

2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?

"Although the data show that reviewers now represent a solid cross-section of underrepresented groups, institutional types, and geographical regions, there are ongoing opportunities to diversify the reviewer pool. The COV suggests that the GSE focus its efforts on increasing the participation of reviewers from community colleges and minority-serving institutions... A stepped up effort to add or increase representation from underrepresented states—especially those in Mountain States region—is highly recommended."

We will continue to seek new peer reviewers with expertise in gender studies and STEM education, from all states and especially from underrepresented groups and minority-serving institutions.

A.3 PORTFOLIO OF AWARDS

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

"The COV found it somewhat challenging to assess 'appropriateness' of the awards in terms of size, duration, and scope of GSE projects because the referent is unclear. The Committee considered several approaches on how future COVs could better assess the appropriateness of awards. We think the following information would be helpful:

- Actual awards amounts compared to the amounts requested by the PI.
- Additional or other external funding (if any) that the PI secured and that contributed to the project's completion.
- How the GSE's budget allocations and awards granted relate to the pool of meritorious awards that would all be funded if 'unlimited funds' were available."

The program will attempt to gather data for the next COV on actual versus requested award amounts as suggested in bullet one above. The program rarely requests drastic changes in award amounts from requested amounts, however. Budget revisions usually are required to adjust specific line items, not to change overall award amounts, although this does happen on rare occasions.

It is not possible for program staff to collect data on additional external funding that PIs obtain from non-NSF sources that contribute to project activities as suggested in bullet two, because that information is not included in NSF standard reporting requirements and is not a criteria for NSF funding.

In regards to bullet three above, program award decisions are made in part on the availability of budgetary resources, but not solely on that basis. Program officers take into consideration the overall portfolio of GSE awards as well as the proposal reviews when making final award decisions. If the program had unlimited funds, the resulting portfolio might not look significantly different than it does currently in terms of award size and duration, except that more projects might be funded. However, the top proposals usually are funded by the program, so an analysis of what might be funded if "unlimited funds" were available is unlikely to produce meaningful information about award size and duration beyond what the current portfolio looks like.

4. Does the program portfolio have an appropriate balance of: Innovative/potentially transformative projects?

"It is also the Committee's position that within the current GSE portfolio, there are additional outstanding research projects that have not been recognized or identified as transformative but which we find merit the designation."

We will continue to evaluate the GSE portfolio of research, diffusion and extension service projects that are cutting edge and that will also generate new and innovative gender strategies in STEM and designate these as transformative where appropriate.

6. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program?

"The COV would find it helpful to know how often large, well-established institutions (and PIs at said institutions) collaborate with and/or mentor PIs at institutions such as Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), etc. While there are a number of collaborative GSE projects, it was difficult for the COV to determine from the format of the data provided how often this type of collaboration occurs."

We will add language to the solicitation which encourages collaborative projects, especially with minority-serving institutions. The program already sponsors a "Broadening Participation Partnership" incentive in its Diffusion of Research-based Innovation track. Program staff will flag partnerships in other tracks that include minority-serving institutions and follow their progress.

8. Does the program portfolio have an appropriate balance of: Geographical distribution of Principal Investigators?

"The program portfolio represents a reasonable balance of geographical distribution of principal investigators (PIs) although there are significant opportunities for improvement...it would be both worthwhile and meaningful to escalate PI recruitment efforts in EPSCoR program states and in states with large numbers of students enrolled in minority-serving institutions... One approach to successfully addressing this challenge might be to set up a formal mentoring program that encourages experienced PIs and institutions to team up with institutions and new PIs from EPSCoR states, MSIs, and heavily urban or rural areas in locations not currently served or reached by GSE projects."

GSE and NSF are ill-equipped to manage a formal mentoring program. The program officer will explore with current and past PIs mechanisms for potentially establishing some kind of mentoring or collaboration project through existing channels and/or through a new grant opportunity.

9. Does the program portfolio have an appropriate balance of: Institutional types?

"Awards to community colleges, minority-serving institutions (MSIs), and non-PhD granting institutions continue to be underrepresented. The COV strongly recommends the GSE program focus attention on increasing the submission of proposals from these underrepresented institutions."

We will prioritize outreach to underrepresented institutions at appropriate conferences and meetings, as well as at the HRD Joint Annual Meeting. The GSE program does not have, however, funding tracks that are strongly oriented toward community colleges. Attempts to connect interested faculty and/or administrators at community colleges with researchers at four-year institutions or PIs from extension service projects might best be approached through a consultation with current and former PIs.

11. Does the program portfolio have appropriate participation of underrepresented groups?

"The COV encourages the GSE program officer and staff to continue efforts to bring more underrepresented researchers into the program. We applaud GSE's participation in regional grant conferences and other venues where they might reach underrepresented groups"

The program officer will continue outreach efforts to underrepresented minority researchers and to individuals and groups that are interested in working with underrepresented minority girls and boys.

13. Additional comments on the quality of the projects or the balance of the portfolio:

"THE COV is pleased to see that many projects in the GSE portfolio include the participation of women and girls from underrepresented ethnic and racial groups. We encourage GSE to continue this focus and expand it further to include projects that explicitly examine issues that are relevant to women and girls from specific ethnic and/or racial groups as well as within group differences in constructs of interest."

This has been and will continue to be a high priority for the GSE program.

"We also think that it is important to learn more about how early childhood learning environments impact girls' efficacy and dispositions toward science and engineering. The COV strongly recommends that GSE consider expanding its portfolio to include more funded projects that focus on girls' social and cognitive development in the early school years (K-3)."

This has been and will continue to be a priority for the GSE program and the program officer will make an effort to reach out to researchers exploring these grade levels.

"The COV recommends that GSE aim to increase the number of community college to four-year college transition projects in the portfolio."

The program officer will explore potential outreach to groups and individuals interested in this area.

A.4 MANAGEMENT OF THE PROGRAM

1. Management of the program.

"Although the COV understands that the LOI [Letter of Intent] process will most likely lead to short-term conservation—saving time, money, and reviewer resources—the Committee is concerned about the potential decline in the GSE program's overall success rate. The COV is also concerned that the shift to the LOI process may further burden the already stretched resources of the program staff. The COV recommends the GSE staff carefully monitor the program to determine the extent to which the shift from preliminary proposals to LOIs positively or negatively impacts the program. Moreover, the Committee suggests that GSE program management define what an acceptable level of decline would be, and when and if the permanent replacement of preliminary proposals with LOIs would be deemed too costly to the program."

In 2003 when the GSE program shifted emphasis away from large implementation proposals to research proposals, the use of preliminary proposals was meant to give early feedback to PIs about the appropriateness of their projects for GSE funding. In the interim, the community has become more informed about the change in emphasis, so that the preliminary proposal is no longer necessary to discourage inappropriate implementation-type activities. At the same time, preliminary proposals are expensive in terms of the program staff time and effort, reviewer community time and effort, and GSE budgetary resources. It also prolongs the entire proposal writing process for PIs. The LOI process does not necessarily add any more to program staff burden than the preliminary proposal process; in fact LOIs consume less staff time. It is less expensive and poses less of a burden on the community. However, the concern over success rates is well placed. The GSE program staff will monitor success rates and determine if the preliminary proposal process for the research track needs to be reinstated.

The preliminary proposal process for the extension service track is no longer necessary. The solicitation is very explicit about what extension service proposals need to include, and the community is more familiar with the extension service concept. The program officer has also asked all PIs submitting a Letter of Intent for extension services to attend an on-line webinar to orient them to the requirements of the funding track and answer questions.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

"The COV was disappointed to learn the Diffusion of Research-based Innovation track is an underutilized component of the GSE program. We suggest that program staff step up efforts to better market and attract higher quality and more diverse proposals. Focused outreach to members of the GSE community and webinars to help publicize Diffusion opportunities also merit further consideration."

The program staff is also disappointed by the lack of enthusiasm for Diffusion and will consider scheduling webinars and other efforts to promote the diffusion track as well as work on track language in the solicitation.

4. Responsiveness of program to previous COV comments and recommendations.

"The previous COV suggested that GSE implement a plan for evaluating the results of their funded projects, as well as organizing their results for dissemination...We strongly encourage the GSE to move forward with this critical endeavor."

A GSE evaluation is a high priority for the program staff and will be pursued in FY2010. The format for the next generation of "New Formulas" is being explored with GSE PIs to create a new, potentially on-line compendium of GSE-funded projects that would be accessible to a wide audience and provide timely and useful information from the projects.

5. Additional comments on program management.

"...the COV is curious about the resources required to maintain, update, or potentially expand the use of the PGELIST. To avoid confusion, it might also make sense to rename the mailing list "GSELIST" so that it corresponds to the acronym for the current program name."

PGELIST has been underutilized in recent years. Program staff will explore using it more frequently. GSE Staff has been informed in the past that changing the name is technologically difficult, but the program staff will explore this option again.

"The COV would find it helpful to know how the number of proposals the GSE program processes on an annual basis compares to other NSF programs."

While this information might be somewhat useful, the program staff also would like to point out that other programs in HRD might have a somewhat smaller proposal load, but their projects require more oversight. Proposal load is increasing in GSE, and the program staff will monitor this and report increases, along with some comparative data, to the next COV.

B. RESULTS OF NSF INVESTMENTS

B.1 Outcome Goal for Discovery:

"The COV finds that in addition to meeting the outcome goal for discovery, each project also has the potential to be highly transformative, yet neither has been identified as transformative in their summary highlights."

The program staff will work to more diligently flag those proposals that could be considered transformative.

B.3 Outcome Goal for Research Infrastructure:

"The COV suggests increased focus and continued support for technological innovations in GSE funding."

Program staff will include language in the solicitation that encourages proposals for technological innovations. The program officer is also on the cyberlearning and cyberinfrastructure team (CI-Team) committees which also promote the development and use of technological innovations.

C. OTHER TOPICS

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

"The COV is troubled by the lack of progress made in the Broadening Participation Partnership Initiative in the Diffusion of Research-based Innovation funding track...We understand that GSE is looking at options for retooling or perhaps even terminating this initiative. The COV encourages the GSE to identify root cause(s) of why the initiative is not working before making a decision to drop it."

The GSE program staff is also eager to keep the Broadening Participation Partnership (BPP) initiative. The failure to attract proposals that are appropriate for this initiative may be tied to the overall lack-luster interest in the Diffusion track. Better marketing to underrepresented institutions, organizations, and individuals might lead to better proposals. We will work on outreach strategies to generate more interest in both the initiative and the track. We will also monitor those proposals that include a BPP and those projects funded to determine what is working.

"Based on our review, it appears that Extension Services and Diffusion projects carry the load of translating research to practice, while Research projects pay limited attention to bridging activities. The COV would like to see additional research projects that focus more on connecting to practitioners, which in turn, could lead to more effective collaborative proposals with diverse partnerships."

This is an excellent suggestion. The solicitation already emphasizes that Research track PIs should include in their proposals an outreach and communication strategy that includes targeting practitioners with the results of the research. We will also encourage more interaction among the Research, Extension Service, and Diffusion PIs at our annual PI meeting in the hopes of generating new collaborations as well as encouraging new efforts to reach practitioners with research results.

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.

"The 2009 COV supports the GSE efforts to develop and implement an appropriate evaluation strategy and plan. In addition, the COV strongly recommends that results of research and other projects funded by GSE be included in and applied to the process of creating and formatting new evaluation criteria, deciding how to inform potential PIs of those criteria through program solicitations and other means, and developing strategies for evaluation system implementation."

We also really like this suggestion and will explore the feasibility of developing both a program evaluation plan as well as guidelines for project evaluation.

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

"The GSE's continued focus on retention is laudable. While the COV supports this effort, we also encourage not only the GSE but also the NSF to define retention more broadly and beyond graduation numbers. When NSF asks PIs to increase the numbers of underrepresented students in STEM, it is necessary but not sufficient to earn the degree. Students must also have viable GPAs and ideally associated academic experiences (e.g., study abroad, student teams, leadership in student organizations, internships) in order to become full practitioners in their respective STEM fields."

The GSE program will include language in the solicitation that defines retention more broadly and that encourages proposers to take a global view of retention.

"Given GSE's charge to help change the environment in all fields of STEM education and to make the community more inclusive with respect to gender, the results of the projects it funds are going to challenge existing paradigms. This is also true of other impact-oriented programs (including those that focus on enhancing inclusivity of other underrepresented groups). The COV suggests that it might be useful for the NSF to establish a committee or panel that regularly "harvests" results of projects funded by such programs with the express intention of investigating those that could be "in the field" of NSF's own

operations. Those that prove effective should be considered when new policies and even new strategic goals are developed."

Such a process has happened and continues to be happening at the Foundation. In 2008 the Foundation established a committee to examine strategies for diversifying the reviewer pool, training NSF staff and reviewers on broadening participation, enhancing accountability, communicating guidance and promising practices on broadening participation, and maintaining a portfolio of relevant programs. The exercise also reviewed some of the internal NSF practices that might be revised. Members of the committee were assisted by a number of NSF program officers from relevant programs, including the GSE program officer, on relevant experiences and research findings. The committee's report, "Broadening Participation at the National Science Foundation: A Framework for Action," is available on the NSF web site (http://www.nsf.gov/od/broadeningparticipation/nsf_frameworkforaction_0808.pdf). NSF Staff, including the GSE program officer, continues to meet on a regular basis to discuss issues and new findings regarding Broadening Participation. So the COV's suggestion is already standard Foundation practice.

C.4. Please provide comments on any other issues the COV feels are relevant.

"The COV is pleased that the program is funding an increasing number of partnership projects. To ensure the successful collaboration of current and future partnerships, it is imperative that PIs understand the two-way nature of collaboration. There are a number of ways that the GSE could facilitate this understanding and ensure more effective collaboration between and among project partners. The COV suggests that GSE consider the following: incorporating explicit guidance in solicitations, creating and distributing a collection of best practices, providing targeted technical assistance, developing and offering a planning grant, and establishing a formal mentoring program for prospective PIs and institutions."

GSE program staff will take into consideration these very helpful suggestions. As noted previously, program staff will consult with current and potential PIs for the best way to promote collaboration across various institutions; incorporate language in the solicitation that encourages collaboration especially among underrepresented groups and organizations; and step up outreach to organizations currently not well-represented in the GSE portfolio. Program staff is limited, however, by the current staffing level to activities that will not add significantly to staff duties. To the extent that some of this might be done through a grant or contract mechanism, GSE will explore opportunities to engage organizations willing to take on some of these roles.

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

The Committee agrees that the COV Introductory Webinar provides an efficient means to introduce participants to fellow COV team members and to key program and other support staff. While the presentation touches on the general COV process, we think the Webinar

could do an even better job of orienting a COV team about what to expect during the two-day session at NSF. We think the technical writer should attend the COV Webinar and perhaps facilitate a short "real world" discussion about the onsite session. The COV also recommends that the Webinar include a brief review of the annotated COV Report Template to familiarize participants with the report format and how the information on the CD relates to the COV report. While the Committee agreed that receiving resource materials in electronic format (CD) was helpful and environmentally friendly, the majority said they were overwhelmed by the sheer volume of information on the CD and didn't know where to get started.

The program staff will review the webinar materials with the aim of putting a premium on what to expect. If the program uses a technical writer during the next COV, staff will make sure that person is available for the webinar discussion. Adding a review of the report template is an excellent suggestion, and the program staff will include such a review. In addition, the webinar will provide an overview of COV materials on the CD.

"Some COV members thought it would be helpful to pre-select a few review questions during the Webinar with the option to do "background" work in advance of the onsite session. We recognize that selecting or requiring pre-work could open the door to other issues that the NSF would prefer not to address."

Future COV members will be given the option to decide whether they want to preselect items to do background work.

"...the Committee recommends that COV organizers encourage participants to come to the onsite session having read, at minimum, the following documents: the *previous COV Final Report*, *NSF Response to the COV Report*, and, if available, the *Update to the NSF Response to the COV Report*."

This is an excellent suggestion, and program staff will address this for the next COV.

If the *Update to the NSF Response to the COV Report* is not available at the time of the Webinar, then it is imperative for the COV team to have a copy of this report no later than the start of the onsite COV meeting (beginning of Day 1). All members of the Committee agreed that the team would have benefited greatly from reviewing this report at the start of Day 1 rather than at the start of Day 2. The information in the report was extremely useful and would have been a logical kickoff to our review process. The group felt that we lost valuable time on Day 1 researching information that was readily available in the report.

A copy of the update will be in the materials sent out ahead of time to the COV team.

With respect to the size of the COV team, the group agrees that while three would be the **absolute minimum** number of panelists required to maintain the integrity of the COV process, the overall process and outcome would be better served by five or six panelists, a full-time Chair (counted as one of the panelists) and the technical writer. The three-person panel and shared Chair format of the GSE COV significantly increased each team member's

workload, made it more challenging for participants to realistically serve as both primary and secondary reviewers, decreased the time available for group collaboration and discussion, and rushed the preparation of the team's presentation to the NSF on Day 2.

GSE program staff, in consultation with the EHR COV management team, will consider increasing the number of COV members during the next COV.

Moreover, the COV does not think that the bundled format is the most suitable format for the COV Chair or the team. The Chair felt that splitting time between the GSE and RDE teams limited her participation in key discussions with both groups. If the NSF continues with the three panelists and shared-Chair COV format, then perhaps the onsite session could be expanded to two and one-half days, This would allow two full days for review and a half-day for team review, presentation preparation, and wrap up.

If feasible, the program staff, in consultation with the EHR COV management team, will request a dedicated chair for the next COV meeting.

In terms of the COV format and report template, one team member felt strongly that the structured format of the COV Report template and the limited time for review severely inhibited discussions about critical issues among the participants. This same COV member felt that the current approach shortchanged the review process and could result in a COV report that achieves about eighty-percent (80%) of its potential. That said, the majority of the team thought that the COV format and report template helped to guide and focus the review process, kept the team on track, and enabled the group to produce a working draft of the COV Report at the conclusion of the two-day session.

The program staff will take into consideration whether the time allotted is too short for the review to be completed in a comprehensive manner. We are always cognizant of the fact that we are asking a lot of our reviewers in terms of time and effort spent, and so we have usually tried to minimize the time on-site. We will discuss with the EHR COV management team whether a longer COV is warranted to ensure a fuller analysis.

SUBMITTED BY Program Officer

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