

**FY 2008 COV Recommendations and Program Response  
for  
Bundled HRD Programs**

National Science Foundation  
September 26, 2007 4:00 PM to September 28, 2007 5:00 PM

Background

As mandated by National Science Foundation policy, the Division of Human Resource Development (HRD), a unit of NSF's Directorate for Education and Human Resources (EHR), convened a Committee of Visitors (COV) panel. The Fiscal Year 2007 (FY 2007) COV addressed operations conducted from FY 2004 to FY 2006 and included the following five HRD programs, selected as representative of HRD's portfolio drafted in service to minorities and minority-serving institutions in science, technology, engineering and mathematics (STEM) education and research:

- Alliances for Broadening Participation: Graduate Education and the Professorate (AGEP)
- Alliances for Broadening Participation: Louis Stokes Alliances for Minority Participation (LSAMP) and LSAMP Bridge to the Doctorate (LSAMP-BD)
- Centers of Research Excellence in Science and Technology (CREST) and Historically Black Colleges and Universities Research Infrastructure in Science and Engineering (HBCU-RISE)
- Historically Black Colleges and Universities – Undergraduate Program (HBCU-UP)
- Tribal Colleges and Universities Program (TCUP)

As was done for the previous COV interval (FY 2001 to 2003), the process combined a number of like-themed programs in the interest of (i) highlighting the breadth of programs and activities within HRD (minority-serving programs in this instance); and (ii) making more effective and efficient use of the COV panelists' collective time and expertise. A designated Chairperson (nominated from the EHR Advisory Committee) had oversight of the actions of various subpanels consisting of 3 to 5 COV panelists assigned to each program. Accordingly, each subpanel focused on the previous three years (FY 2004 to FY 2006) for their assigned program. All panelists then participated in the articulation of their observations and recommendations to EHR via a combined formal report.

The program staff of the selected five HRD programs have received the report of the Committee of Visitors (COV) for FY 2007. They have responded to the COV template sections, with sections A and B reported here in five separate program reports, while section C is reported as a combined document.

## Introduction

We express our gratitude to the Committee of Visitors (COV) for their extraordinary and meticulous evaluation of the selected programs of the Division of Human Resource Development (HRD), including, the Alliances for Graduate Education and the Professoriate (AGEP), the Louis Stokes Alliances for Minority Participation (LSAMP), the Centers of Research Excellence in Science and Technology (CREST), the Historically Black College and Universities – Undergraduate Program (HBCU-UP), and the Tribal Colleges and Universities Program (TCUP). The panelists reviewed records for five (5) programs in order to produce a COV report that provides both synthesized and individual program commentary for these selected programs in HRD’s diversity programming continuum.

It should be noted that the unique design of this COV for multiple HRD programs – especially including the use of a website and pre-meeting webinars – has given the Division, the Directorate and the NSF as a whole a new model for contemplating the operation of related programs and the COV processes generally.

### **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.**

The COV noted that the review mechanisms used seem appropriate and that the panels seemed good in addressing proposals covering the diverse interests of the submitters. However, the COV urged NSF to address (1) uneven implementation of merit review (variance in levels of detail in individual and panel summary reviews), (2) a need to increase the number of panel reviewers with specific technical experience in topics relevant to the proposals under review, and (3) a need to increase panelist training regarding the sensitivity in crafting their review response. Some members of a COV subpanel indicated that they did not have access to all reviews and suggested that improved explanation of amendments or of elements that do not agree within the composite document would be helpful.

[Programs’ Response] HRD staff noted that merit review of proposals may include *ad hoc* or “mail” review in addition to the on-site panel. This approach allows the incorporation of specialized expertise in the review process, without incurring the impracticality of bringing a large number of reviewers on-site. Program officers will endeavor to ensure that the review analyses on supplements are handled with diligence and consistence in all aspects, and that appended materials are properly documented. There are often points that come out in discussion that are not addressed in individual reviews. This may contribute to the observation that the panel summary is more expansive than the collective individual reviews. The HRD staff will continue to monitor

and promote more consistency in the quality of reviews and panel summaries, and will address the concerns raised by the COV in more detail during reviewer training.

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

The COV recommended that NSF provide more training of reviewers with regard to the Merit Review criterion on “broader impacts,” and on taking more care in developing panel summary conclusions when the reviewer ratings have a wide range.

[Programs’ Response] Program officers will continue with renewed rigor to give all reviewers an orientation on NSF’s expectations in their use of the NSB Merit Review criteria and the need to both critically evaluate proposals as well as to write thorough and accurate panel summaries that align with and reflect reviewer ratings.

### **A.3 Questions concerning the selection of reviewers.**

The COV recommended that NSF give more attention to the gender balance of panels.

[Programs’ Response] This issue is of concern to the Program Officers as well. More effort will be made to widen the pool of reviewers, paying special attention to the gender balance. Program officers will endeavor to ensure that the reviewer pool reflects the S&E research and education community and is diverse with respect to ethnicity, gender, disability, institutional type, geographic location.

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

The COV noted that the research activities supported by HRD are good ... the program appears to be supporting research in which clear goals are articulated and will serve as a mechanism to raise the quality of research at the funded institutions. However, the COV recommends that NSF considers increasing the amounts and duration of [HRD] awards for operation of multifaceted centers that are attempting to develop research and education in a complex environment. Also, efforts could be made to get more participation by two-year institutions and schools in diverse geographic regions, since they do seem to be underrepresented in the portfolio. Consideration should also be given to thinking about involving non-traditional and non-STEM disciplines in collaborative efforts (e.g., social sciences) that could help STEM efforts and mutually support the disciplines. Also, the COV encourages the exploration of additional ways to develop leadership within the programs. Finally, the COV was not clear on how projects report uniformly when they are in different developmental stages, such as planning and capacity building.

[Programs' Response] While program officers support the recommendation to increase the amount/duration of awards, there could be adverse effects (e.g., reductions in number of awards) if award amounts and duration are increased without correlative increases in the programs' budgets.

More outreach to two-year institutions to increase participation in HRD is planned, as well as exploring the feasibility of involving non-STEM disciplines in collaborative efforts. We note, however, that the programs support extended student research experiences in multidisciplinary research through participation in the NSF-Department of Energy (DoE) Cooperative Activity each year. For example, in 2006, HRD programs funded students and faculty at national laboratories in multidisciplinary research ranging from nanotechnology to computer sciences. Also, several HRD programs have supported technical assistance programs that help to improve proposal writing, grant administration, and leadership skills.

Most HRD programs -have developed report templates or crosswalks to guide Principal Investigators (PI) in providing quantitative information by which the projects' individual progress can be measured. The templates have built in flexibility that allow PIs to report and comment on data and activities designed to demonstrate the project is working towards meeting goals and objectives. The template is not designed to provide comparative results between the projects, but, rather, to monitor each individual project in a cumulative manner.

#### **A.5 Management of the program under review.**

The COV indicated that the program management was commendable, particularly given the apparent low-level of staffing and the absence of permanent staff in some programs. The COV urges the NSF to consider mechanisms that reduce turnover of personnel and improve retention of institutional memory, which it regards as critical for proper management. The absence of a permanent program officer can create obstacles to communication with awardees, which can be particularly problematic for minority-serving institutions attempting to develop research and education infrastructure.

The COV recommends that program management analysis data should be compiled and then mapped according to metrics derived from the management plan to further assess the program relative to the award and declination outcomes.

The COV recommends that HRD get more analysis of whether the products of its programs add to the knowledge base for emerging areas, such as new perspectives on pedagogy and areas of study. In a future COV, in addition to the jackets, it may be helpful to see the products that were produced by the grantees.

[Programs' Response] NSF recognizes the need for effective management and is already addressing staffing issues in some programs, and will continue to work to prevent loss of institutional memory particularly as associated with staffing transitions.

HRD appreciates the usefulness of systematic evaluation of program outcomes and how they relate to the management plan and related program activities. We will explore the options for extending the current portfolio evaluation activities to incorporate more explicit use of the programs' management plans.

HRD is currently looking for/at ways in which to better disseminate the products developed using funding from its programs. One such model is the publication in the HRD Research on Gender in Science and Engineering program, *New Formulas for America's Workforce* ([www.nsf.gov/newformulas](http://www.nsf.gov/newformulas)).

## **PART B. RESULTS OF NSF INVESTMENTS**

### **B.1 OUTCOME GOAL for Discovery**

*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering.*

A COV subpanel indicated that awardees have been very productive with respect to publications and patents, with many boasting more than 50 publications acknowledging NSF/HRD support, and some touting extraordinary output. Many PIs have become recognized leaders in their disciplines, as evidenced by leveraged support from other sources, which also fulfills the expectation of sustainability.

[Programs' Response] These comments are duly acknowledged and every effort will be made to sustain program management in order to support research and education that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering and S&E education.

### **B.2 OUTCOME GOAL for Learning**

*"Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens."*

A COV subpanel indicated that HRD funded institutions collectively are making substantial advances toward cultivating and contributing a large number of emerging scientists and engineers drawn from groups traditionally underrepresented in these fields. The subpanel urges HRD to continue encouraging the research training of undergraduates at HBCUs and minority-serving institutions, as these students represent a large reservoir

of potential talent for the science and engineering workforce. The subpanel also urges NSF to encourage their awardees to implement outreach activities that increase the awareness of science and engineering within their institutions as well as among the public in the communities directly served by the institutions, perhaps through supplements earmarked for this purpose.

[Programs' Response] Outreach activities are encouraged and supported. HRD will continue to require and support innovative outreach activities to increase awareness of science and engineering within institutions as well as among the public in the communities served by the funded institution.

### **B.3 OUTCOME GOAL for Research Infrastructure**

*“Build the nation’s research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.”*

A COV subpanel indicated that the contributions of the HRD programs to research infrastructure are stellar, funding laboratory renovation and installation of new equipment at institutions where these investments have had a high impact in grants where those activities are part of the program mandate.

[Programs’ Response] NSF will continue to sustain and support the outcomes of building the research infrastructure in appropriate programs, relative to the availability of funding. NSF is examining ways to enhance our strategies to broaden Hispanic participation in STEM fields. We are in the process of gathering best practices from existing programs and lessons learned from scholarly research. As we proceed, we look forward to holding a productive dialog with the community.

## **PART C. Summary of OTHER TOPICS**

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

The COV sub panels generally commended program management in the HRD programs reviewed. The recommendations made in C.1. addressed opportunities for collaboration, program assessment, support for declined submitters to submit improved proposals, and the need for increased budget to facilitate program expansion.

Recommendations:

Opportunities for collaboration.

- **Find more ways to encourage collaboration across an institution, including with non-STEM departments and units (e.g., I<sup>3</sup>).**
- **Pursue active partnering with other agencies and foundations to promote synergy and remove repetition.**
- **Increase capacity for quality training at MSI partner institutions. These schools must get more out of the program than the satisfaction of sending their students to Alliance institutions.**
- **Manage programs so as to make seamless the continuum from the baccalaureate to the doctorate to be realized.**

[Programs’ Response] The program staff will continue to encourage proposers to think creatively, although it should be noted that each institution develops a program that

makes sense for that institution. However, the groundwork is laid for creating projects that are cross-departmental, across programs, and across schools. More emphasis and encouragement in this regard will be given through outreach and technical assistance. The staff also will continue to aggressively pursue collaborative opportunities with other agencies and foundations, including exploring opportunities to more systematically develop cross-agency and cross-programmatic partnerships.

HRD programs currently support provisions to increase capacity at MSI partner institutions. Faculty development, undergraduate research, curriculum development, and a wide variety of student and faculty forums within and across institutions and alliances serve to build cooperative capacity for training among HRD portfolio participants. The program staff will continue to encourage grantees to pursue such developments across the S&E continuum.

Program assessment.

- **Incorporate site visits as a valued component for the review process, especially for renewal applications (note – already in place for some programs via technical assistance grants).**
- **Include proper controls in programmatic assessment (e.g., better tracking of achievement of program objectives).**

[Programs' Response] Site visits and reverse site visits are both currently used as a part of the post-award management evaluation process in HRD programs. Limitations in travel funds for the program directors has necessitated the use of reverse site visits in many cases, as well as current considerations of electronic site visits using video teleconferencing technology. Another alternative approach has been to develop site visit teams that did not include NSF staff.

The issue of proper controls for program assessment is complex. Currently, most HRD programs have portfolio-wide data collection activities, as well as portfolio-wide program assessment/evaluation in place. The combined approaches should effectively address the control issues raised by the COV.

Support for declined submitters to submit improved proposals.

- Assist declined proposal submitters to present future proposals, perhaps through planning grants (note – already in place for some programs via technical assistance grants).

[Programs' Response] The HRD program generally offer technical assistance support through workshops featuring experienced individuals versed in higher education partnerships. This opportunity includes seminars offered at the HRD Joint Annual Meeting and other venues. Applicants (awardees and declinees) who avail themselves of this benefit are generally more successful in the merit review process after revising and re-submitting the proposal, as well as in grant administration.

Increased budget to facilitate program expansion.

- **Increase budget to facilitate expansion of programs and program management.**

[Programs' Response] It seems likely that increases in program budget improve our ability to expand the diversity of funded projects in science and technology and balance in many facets without decreasing core support. Program staff will continue to support this trend with any increase in funding.

**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 COV sub panels indicated that the information provided shows that the overall performance is quite good.**

**Recommendations:**

- **Have good definitions for the relevant terms in objectives (e.g., research infrastructure).**

**[Programs' Response] NSF program solicitations frequently incorporate language used more broadly across the Foundation. However, HRD staff will strive to provide clarity in use of terms, particularly in guidance of programmatic objectives and stipulations.**

- **More rigorous analysis of outcomes, including more controls, more information gathered, and better quantitative assessment.**

[Programs' Response] The issue of proper controls for program assessment is complex. Currently, most HRD programs have portfolio-wide data collection activities, as well as portfolio-wide program assessment/evaluation in place. It is expected that through the evaluation activity, programs will have a better knowledge of their progress in meeting the stated goals. The combined approaches should effectively address the control issues raised by the COV.

- **Know as much as possible about the existing pool and what is important to that group including their reasons for making their career choices, information about students who leave STEM disciplines and their reasons for doing so.**

[Programs' Response] HRD staff makes a continuing effort to determine the most effective ways to provide more effective pathways from undergraduate to graduate school

(and into career). The building of seamless administrative infrastructure, academic infrastructure, comprehensive and holistic student support mechanisms, and effective career progression pathways poses a significant challenge to the design and management of our continuum of programs to broaden participation of underrepresented groups.

For example, the TCUP Annual Report template was created to guide projects in providing quantitative information by which the projects' individual progress can be measured. The uniform structure of the template allows the TCUP Program Director easy access to data concerning all relevant aspects of a project's progress: number of students and faculty involved, STEM enrollment and graduation numbers, number of courses affected by the project, and yearly activities and project highlights. Supplemental activities are reported as part of the Implementation report. The template is periodically revised to reflect evolving program emphases.

- **Consider community college faculty as resources.**

[Programs' Response] Many of HRD's grants include community colleges in their partnerships, which increases the quality and quantity of underrepresented minorities in STEM disciplines. Community college leadership is represented in governance roles in projects through participation on governing boards and executive committees. Further, project annual reports show that students from community colleges actively attend and participate in the academic support activities and research experiences offered through HRD-supported programs. HRD staff will continue to encourage the incorporation of community college faculty in grant activity as appropriate resources.

- **Increased participation in international opportunities, and increased funding to support that activity.**

[Programs' Response] HRD staff agrees with the recommendation that grantees should selectively increase student participation in international opportunities. Towards that goal, the most senior grantees are expected to develop formal strategies for international involvement of students; this is particularly reflected in the LSAMP program guidelines.

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| <b>C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.</b> |
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**The COV's comments and/or suggestions regarding program performance were as follows:**

- There were substantially more worthy but unfunded projects (than ones that were funded but seemed a bit weak): programs do not have enough money. Increase budget and staff for COV reviewed NSF programs (increased K-12 teacher development particularly noted in aligning with the ACI). Also, HRD should encourage schools with multiple NSF programs to coordinate resources, and limit duplicative administrative costs.

[Programs' Response] It seems likely that increases in program budget improve our ability to expand the quantity of high-quality funded projects in science and technology and balance in many facets without decreasing core support. Similarly, additional funded projects necessitates additional program staff to manage  
Program staff will continue to support this trend with any increase in funding.

- NSF/HRD should review the funding levels for students; master's student levels may not align with levels for doctoral students at most campuses.

[Programs' Response] The comprehensive and holistic student support mechanisms and effective career progression pathways – especially to broaden participation of underrepresented groups – are important objectives for HRD staff. We will continue to review current modes and levels of program and student funding and revise practices as needed to achieve the best design(s) for student support.

- Increase the representation of panel reviewers with experience in specific technical topics relevant to the proposals under review. (Note: this is frequently addressed via *ad hoc* reviewers outside of the panel meeting event.)

[Programs' Response] HRD submittals frequently include a broad range of sub-disciplinary areas. It is usually impractical to bring the dozens of highly specialized technical reviewers to NSF that would be needed to address each of those areas, so HRD staff request specialized reviewers to submit technical reviews “by mail.” This process is *ad hoc* review. However, program officers will endeavor to increase the representation of on-site panel reviewers with experience in specific technical topics relevant to proposals under review, and will continue to monitor and promote more quality in reviews and panel summaries.

- **Increased clarity in program descriptions and requirements.**

[Programs' Response] HRD staff will strive to provide greater clarity in use of terms, particularly in guidance of programmatic objectives and performance expectations.

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

**The COV's comments and/or suggestions on other relevant issues were as follows:**

- Proposes need additional instruction on the difference between intellectual merit and broader impact. (Note – already in place for some programs via technical assistance grants)

[Programs' Response] The components of a good proposal review, including what constitutes intellectual merit and broader impacts, is addressed in outreach for principal investigators submitting letters of intent as well as in the technical assistance workshops provided annually to those who have been declined. NSF program officers agree that more emphasis on this topic may be necessary and will work to address this clarification.

- **Help HCBU faculty to develop stronger research experience and infrastructure, perhaps through partnership with strong research institutions and research I university/faculty.**

[Programs' Response] Program officers will continue to encourage diverse collaborations through supplemental awards and other mechanisms. Additional efforts will be undertaken to bring to the attention of awardees about these collaborative avenues in proposal preparation seminars and at other meetings such as HRD Joint Annual Meetings (JAM).

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

The COV's comments and/or suggestions on how to improve the COV review process, format and report template were as follows:

**Process:**

- **Map out the COV process for the panelists in diagram form, visually identifying the inputs and outputs for each process step.**
- Provide proposals in review portfolio for reading prior to the committee meeting.
- Revise the orientation session so that it is uniform for everyone. An overview of the management of the process would be helpful. Provide concise and targeted instructions on the process of the COV and the efficient mechanism for the review.

- Clear distinction of the relevance, or weight, of each of the two review criteria (intellectual merit and broader impact) should be given for each program. This will facilitate the COV in reviewing the emphasis and significance of the contents provided by the proposal reviewers.

[Programs' Response] The HRD staff will review all procedures associated with COV process. Appropriate updating of both process and content will be undertaken as appropriate.

Template:

- Reducing the number of prescribed questions in the template while retaining the content germane to the most important issues would be helpful.

[Programs' Response] The template for use by the Committees of Visitors is developed and managed by the NSF Office of the Director. Through its inclusion in this report, your recommendation will be considered and resolved by that office. Your feedback is appreciated.

Format:

- A meeting (dinner) the night before the formal process begins would be extremely helpful in allowing the sub-panel members get to meet each other as well as receive an orientation from the program staff.

[Programs' Response] HRD staff agrees that having the COV members gather for orientation and team-building prior to the core activity is a good idea. We regret that some panelists seem to have been unaware of the scheduled activities at the beginning of the COV event on September 26, 2007 at 4:00 PM, which included a review of the Panelist Orientation Seminar Information (provided earlier via Webinar), and a discussion of the overview of the 2007 COV Structure and Process, Meeting Agenda and Timeline, prior to the core activity, which began the following morning.. In the future, we will increase the communication focus to ensure that all participants understand the COV schedule and preparation opportunities.

- Electronic Jackets should be complete with all related documents (reviews, proposal etc) with full proposals available within supplementary links.

[Programs' Response] Program officers agree that better documentation is needed in regards to electronic filing into the NSF electronic jacket system. The transition to the electronic jacket system is has been slow that is why paper jacket were made available at the COV. Program staff will endeavor to ensure that all electronic files for submitted proposals, funded proposal and also proposals with amendments are complete and comprehensive.

Other:

- Successful programs (or best practices) should be shared.

[Programs' Response] HRD staff is very interested in determining the best pathways available for disseminating successful practices from our projects to a broader audience, including increasing the flow of information between HRD-funded institutions and NSF. We will continue to explore options; in the interim, we hope that the model efforts by several programs, such as the publication in the HRD Research on Gender in Science and Engineering program, *New Formulas for America's Workforce* ([www.nsf.gov/newformulas](http://www.nsf.gov/newformulas)), pose useful resources for the community.

**C.6 How can the expertise and benefits realized by the efforts of HRD programs be infused across NSF, not just among directorates and programs but to the areas where discipline-specific inequities in broadening participation persist?**

The COV's comments and/or suggestions regarding infusing expertise and benefits realized by the efforts of HRD programs across NSF were as follows:

- Make sure that all of the NSF programs are aligned to NSF's overall goals and objectives, including those that further the participation of underrepresented groups in STEM fields. NSF staff in other programs must also be aligned to these goals and objectives, and all must understand that this is critical to the success of NSF as a whole. The different units of NSF should be working together on these goals and objectives, and never view the different programs as being in competition.

[Programs' Response] NSF program solicitations undergo rigorous review before being approved for posting. In general, the program guidelines should reflect the NSF mission, vision and goals, which are designed to maintain and strengthen the vitality of the U.S. science and engineering enterprise. The review includes not only several levels of staff within the EHR directorate, but also the Office of Budget, Finance and Awards (BFA), and the Office of the Director (OD), as well as others. At the same time, the program should accommodate the targeted needs that specific program is intended to address. While this is a complex juggling act, HRD staff will endeavor to ensure that our programs are clearly aligned to NSF's overall goals and objectives.

- Encourage, or increase, cross-directorate and cross-program communication and support.
- Consider mechanisms that enable HRD to cooperate more extensively with other divisions and directorates to improve the proposal and award process, with the ultimate goal of improving the scientific outcomes as well as broadening participation in STEM. The COV commends the NSF for instilling a spirit of education and outreach across all directorates.

[Programs' Response] While a variety of partnerships with other NSF programs, divisions, and directorates are ongoing, program officers will continue to encourage diverse collaborations through collegial exchange, co-funding of awards, partnered site visits and other mechanisms.

- NSF could encourage and develop a mechanism whereby HRD programs' students could be involved in research in discipline-specific grants supported by the Foundation.

[Programs' Response] We are pleased to report that EHR has a new initiative that is responsive to this recommendation. *Innovation through Institutional Integration (I3)* challenges institutions to think strategically about creative integration of NSF-funded awards towards a whole that exceeds the sum of its parts. The goal is to promote creative integration of NSF-funded awards including other NSF awards (non-EHR) with a STEM educational focus. Such integration is likely to pose exceptional learning opportunities for students, including involvement in discipline-specific research at their institutions.

**C.7 What role can HRD's programs serve in broadening and deepening STEM issues of importance to all Americans, including the public understanding and appreciation of science and engineering?**

The COV's comments and/or suggestions regarding broadening and deepening STEM issues of importance to all Americans were as follows:

- Dissemination – A deliberate and intentional “media blitz” by the participating institutions to get the word out on the excellent work that is being done through this program.
- Formalized public relations program – Publications that outline or describe the various inter-directorate programs should be widely disseminated (e.g., a special segment of the NSF website dedicated to such content and/or by emails to appropriate individuals/groups nationally).
- Community outreach – Presentations and tutoring in high schools could stimulate students and make the public aware of the importance of science. This could be implemented as a requirement of an award or an optional supplement to an award.

[Programs' Response] HRD staff is very interested in determining the best pathways available for disseminating successful practices from our projects to a broader audience, including increasing the flow of information between HRD-funded institutions and NSF, as well as with the public. We will continue to explore options; in the interim, we hope that the model efforts by several HRD programs inject useful resources into the community.

**C.8 In light of the American Competitiveness Initiative (ACI), “Rising Above the Gathering Storm” and other reports, how can successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce?**

The COV’s comments and/or suggestions regarding how successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce were as follows:

- More metrics should be developed to assess the short- and long-term impact of these projects.

[Programs’ Response] The issue of proper controls for program assessment is complex. Currently, most HRD programs have portfolio-wide data collection activities, as well as portfolio-wide program assessment/evaluation in place. It is expected that through the evaluation activity, programs will have a better knowledge of their progress in meeting the stated goals.

- A multi-media campaign that addresses the importance of the opportunities and successes in STEM fields could be instrumental in broadening diversity at earlier levels.
- Suggested activities include
  - (1) Use the metrics to focus the attention of the public and inform them on the possibilities for success in this area.
  - (2) Strengthen the relationship between NSF and industry to assure a good dissemination of the report(s) there.
  - (3) Increase conversations between directors of funded projects, and use insights from them on how to get the word out.
  - (4) Engage and partner with marketing and information dissemination arms of funded institutions to help with this effort.

[Programs’ Response] HRD staff is very interested in determining the best pathways available for disseminating successful practices from our projects to a broader audience, including increasing the flow of information between HRD-funded institutions and NSF, as well as with the public.. We will continue to explore options; in the interim, we hope that the model efforts by several HRD programs inject useful resources into the community.

**C.9 What more can HRD's portfolio do to engage a broader community of applicants, in particular institutions that serve minority STEM students but which are themselves underrepresented in receiving NSF funding for research and education?**

The COV's comments and/or suggestions regarding how HRD can engage a broader community of applicants were as follows:

- Partnership between non-STEM disciplines and STEM disciplines could help achieve the objectives of HRD through efforts that focus on the elements that lead ultimately to success in STEM. This may mean consideration of proposals that do not fit into the "box" of a particular solicitation, but HRD could send the message that creative proposals in such a direction will get a careful reading and consideration.
- Partnering with other agencies, including governmental and/or private foundations (e.g., Sloan and HHMI) could be helpful.

[Programs' Response] While a variety of partnerships with other NSF programs, divisions, and directorates are ongoing, program officers will continue to encourage diverse collaborations through collegial exchange, co-funding of awards, partnered site visits and other mechanisms. Partnering with groups outside of the Foundation will also be explored.

- Conducting regional grantsmanship workshops could provide opportunities for competitive applications from organizations that do not have NSF funding or experience. This could extend opportunities to 2-year and 4-year colleges, with large enrollments of underrepresented groups, to increase their ability to compete for NSF funding.

[Programs' Response] The HRD staff will continue to monitor and promote more diversity in the source of proposal submittals and will address the concerns raised by the COV in more detail during training. The components of a good proposal review, including what constitutes intellectual merit and broader impacts, is addressed in outreach for principal investigators submitting letters of intent as well as in the technical assistance workshops provided annually to those who have been declined. More emphasis and encouragement in this regard will be given through outreach and technical assistance.

**C.10 In what way are lengthier projects (i.e., those longer than 3-4 years) held accountable for continued funding, as via formative evaluations and other kinds of evaluation?**

The COV's comments and/or suggestions regarding evaluation and accountability for lengthier projects were as follows:

- This is an area in which improvement could occur. Projects should establish not just timelines, but critical milestones that must be achieved before the project is considered on track. Care must be taken not to discourage projects with some risk that might mean that the milestones are not guaranteed, but in that case it should be clear that something has been learned from that, and not just that the project slipped for reasons that could have been avoided.
- There is a robust and working system in place.
- Current documentation shows that lengthier projects do have to demonstrate success in terms of graduation rates; however, it would be helpful if information related to job status/graduate school status was provided. This, too, would demonstrate an added measure of success. A suggestion: In addition to reporting graduation rates, job/graduate school status also be provided.

[Programs' Response] The issue of proper controls for program assessment is complex. Currently, most HRD programs have portfolio-wide data collection activities, as well as portfolio-wide program assessment/evaluation in place. The combined approaches should effectively address the control issues raised by the COV, including for lengthier projects.

**C.11 How are examples of "What Works" captured in the course of reviewing the portfolio's activities? How are these exemplars disseminated or used to inform broader, more integrated approaches in support of the program's goals?**

The COV's comments and/or suggestions regarding how examples of "What Works" are captured and disseminated were as follows:

- The HRD program publications (e.g., "HBCU-UP Academic Indicator Report 2005," 2007 AGEP Magazine produced by The University of Alabama – Birmingham, et al.) have been useful in capturing the portfolio's activities. Broader dissemination of this document could help get the word out and be useful to others in informing their activities.

- Not all projects funded by NSF have brochures as attractive as those produced for the LSAMP program. Perhaps other HRD programs will use the LSAMP materials as prototypes for demonstrating successes.

[Programs' Response] HRD staff is very interested in determining the best pathways available for disseminating successful practices from our projects to a broader audience, including increasing the flow of information between HRD-funded institutions and NSF, as well as with the public. We will continue to explore options; in the interim, we hope that the model efforts by several HRD programs inject useful resources into the community.

**C.12 Appreciating that ethnicity/gender/disability status may be under-reported by PIs and reviewers alike, what efforts are being made to ensure the broadest solicitation, application and utility of this program's awards and the outputs derived from them?**

The COV's comments and/or suggestions regarding how HRD can ensure the broadest solicitation, application and utility of this program's awards were as follows:

- NSF needs to remain closely in contact with the people already working in this area, who can also help identify further people who could be brought into this effort. They should also continue to build on the large amount of data they already have for this, and could also take a more market-oriented approach to discovering who is not being reached by their efforts and how to bring them into the fold. All NSF-funded programs' annual reports should include the breakdown of such data.
- NSF does a good job with ethnicity and gender. It appears that greater outreach is needed to organizations and institutions that focus on disabilities. We encourage NSF to solicit applications from other related institutions, for example, Gallaudet University.

[Programs' Response] NSF program solicitations reflect the NSF mission, vision and goals, which are designed to maintain and strengthen the vitality of the U.S. science and engineering enterprise.. At the same time, the program should accommodate the targeted needs that the specific program is intended to address. For example, the HRD program, Research in Disabilities Education (RDE), that specifically targets broadening the participation and achievement of people with disabilities in all fields of science, technology, engineering, and mathematics (STEM) education and associated professional careers was not part of this specific bundled COV. While this is a complex juggling act, HRD staff will endeavor to ensure that our programs are available to all communities.