

**HBCU-UP FINAL REPORT
For
FY 2010 NSF COMMITTEE OF VISITOR (COV) REVIEW**

Guidance to NSF Staff: This document includes the FY 2010 Committee of Visitors Final Report of the HBCU-UP Program. The COV followed the specific guidance for the COV review process as described in Subchapter 300-Committee of Visitors Reviews (NSF Manual 1, Section VIII) at: www.inside.nsf.gov/od/oia/cov.

The COV report provides a balanced assessment of NSF’s performance in two primary areas: (A) the integrity and efficiency of the **processes** related to proposal review; and (B) the quality of the **results** of NSF’s investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. The COV studied confidential material for Part A of the Core Questions such as declined proposals and reviewer comments. The *COV report does not contain confidential material or specific information about declined proposals*. Discussions leading to answers for Part B of the Core Questions involved the study of non-confidential material such as results of NSF-funded projects. The report is useful in assessing agency progress in order to meet government-wide performance reporting requirements that are available to the public. We understand that material from COV reports may appear in NSF performance reports and may be subject to an audit.

**FY 2010 NSF COMMITTEES OF VISITORS (COV)
REPORT FOR HBCU-UP**

The table below has been completed by program staff.

Date of COV: August 31 – September 2, 2010
Program/Cluster/Section: Historically Black Colleges and Universities – Undergraduate Program (HBCU-UP)
Division: Division of Human Resource Development
Directorate: Education and Human Resources (EHR)
Number of actions reviewed:
Awards: 31 Declinations: 19 Other: N/A
Total number of actions within Program/Cluster/Division during period under review:
Awards: 125 Declinations: 118 Other: N/A
Manner in which reviewed actions were selected:
Random sample of award and non-award actions ending in the numerals “3”, “5” and “8” at end or second from end of award/decline identification number. The sample includes new, incremental and supplemental actions other than this methodology to form a representative sample of the portfolio.
<i>Innovation through Institutional Integration (I3) actions may be included in the total number of actions but were not reviewed by this Committee of Visitors.</i>

**FY 2010 NSF COMMITTEES OF VISITORS (COV)
REPORT FOR HBCU-UP**

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

The COV briefly discussed and provided comments for *each* relevant aspect of the program's review process and management, and based comments on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. We provided comments for *each* program that was reviewed and for those questions that were relevant to the program under review. We used quantitative information to answer some questions, and made constructive comments noting areas in need of improvement.

A.1 Questions about the quality and effectiveness of the program's use of merit review process. Provide comments in the space below the question. Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE¹
<p>1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?</p> <p>Comments:</p> <p>Panel reviews were appropriate in most instances, and were accurate summaries of the reviews. Sometimes they offered additional information. Additional site visits prior to proposal award/decline may help determine the feasibility of the proposals and verify accomplishments; however, the panel review without a site visit was fair and accurate in its review. The number of panel members (3 to 5 persons) reviewing each proposal was an appropriate number. The reviewers would be considered peers.</p>	Yes
<p>2. Are both merit review criteria addressed</p> <p style="padding-left: 20px;">a) In individual reviews?</p> <p style="padding-left: 20px;">b) In panel summaries?</p> <p style="padding-left: 20px;">c) In Program Officer review analyses?</p> <p>Comments:</p> <p>Most of the reviews addressed the merit review criteria, but some reviewers still need training in evaluating both review criteria in individual reviews.</p>	Yes

¹ If "Not Applicable" please explain why in the "Comments" section.

<p>Some panelists provided only descriptive information in answering the two merit review criteria and stated concerns in the summary statement. This most likely resulted from a misunderstanding of what was expected in answering the merit review criteria; we suggest that NSF staff provide guidelines and training on how to determine the presence of and evaluate merit review criteria.</p>	
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<p>3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?</p> <p>Comments:</p> <p>In most cases, reviewers provided substantive comments. There were a few cases where a reviewer provided only descriptive and not analytical comments. There appeared to be some confusion by some reviewers as to whether strengths and weaknesses should be written in conjunction with answering the two merit review questions or rather written in the summary statement. In the cases of REU experiences and DOE supplements, there were no reviews and the NSF officer justified a decision in the review analysis.</p> <p>HRD has identified some excellent reviewers, but several seem to give only a glance at the proposal summary before rating it. We saw several reviews with very similar points, but different ratings. This underscores how subjective the rating system can be. NSF could consider more specific guidelines for the ratings.</p>	<p>Yes</p>
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<p>4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?</p> <p>Comments:</p> <p>In the jackets read, all panels reached a consensus and provided rationales for those decisions. The panels seemed fairly well balanced with some that were made up of the reviewers themselves. In most cases, staff achieved their goal of a minimum of three (3) reviews to use to base their decisions.</p>	<p>Yes</p>
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<p>5. Does the documentation in the jacket provide the rationale for the award/decline decision?</p> <p>(Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.)</p> <p>Comments:</p> <p>The documentation appears complete in most cases. One file had positive reviews and panel summary, but the review analysis focused only on weaknesses and declined the grant. This led us to believe that information was missing in the jacket on the rationale for the decision.</p> <p>The documentation in all cases studied provided sufficient rationales for the funding decision. Staff effectively negotiated with PIs to resolve the concerns of the panelist before an award was made.</p> <p>We encourage the inclusion of discussion material in decline notifications to provide the PI with comment feedback and to inform their future proposals.</p>	<p>Yes</p>
<p>6. Does the documentation to PI provide the rationale for the award/decline decision?</p> <p>(Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.)</p> <p>Comments:</p> <p>In most cases the correspondence file shows any negotiations that occurred leading to the final decision. There were some panelist reviews that did not provide sufficient reasons for a low rating. However, in those few cases, the decision was not impacted by this deficiency.</p>	<p>Yes</p>
<p>7. Is the time to decision appropriate?</p> <p>Note: Time to Decision --NSF Annual Performance Goal: For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later. The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals.</p>	<p>Yes</p>

<p>Comments:</p> <p>In cases that we looked at, the time to decision was appropriate, and in a few cases, within four (4) months. Holding the panel reviews within a few months of the solicitation deadline kept the process moving.</p>	
<p>8. Additional comments on the quality and effectiveness of the program's use of merit review process:</p> <p>In general, the process was effective. There is a need to better explain to reviewers what is expected in addressing the two merit review questions and the summary statement. Some reviewers expressed their concerns in the summary statement but not in response to the two questions.</p>	

A.2 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE²
<p>1. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>Comments:</p> <p>Reviewers seemed qualified. Because several of the proposals were college-wide, reviewers with a larger view of university department interaction and culture may help the process (deans, provosts, etc.) We realize that it can be difficult to get commitments from administrators, but their point of view can help evaluate proposals in a more thorough way.</p> <p>There is a concern that two (2) proposals from a community college did not have peer reviewers from a community college to evaluate the proposals.</p>	Yes
<p>2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?</p>	Yes

² If "Not Applicable" please explain why in the "Comments" section.

<p>Note: Demographic data is self reported, with only about 25% of reviewers reporting this information.</p> <p>Comments:</p> <p>Gender balance of reviewers was fair, and several types of institutions were represented. Geographically, reviewers were mostly from the region of HBCUs which are located mainly in the South and Southeast, with several reviewers from the Northeast. Perhaps some reviewers can be recruited from smaller colleges in the West, even if they are not MSIs, especially if their background includes a strong evaluation expertise that can inform review panels.</p> <p>The balance of reviewers from underrepresented groups was also fair.</p>	
<p>3. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p>Comments:</p> <p>We did not see conflicts of interest recognized in many of the jackets – it seemed that the reviewers were chosen to avoid these.</p>	Yes
<p>4. Additional comments on reviewer selection:</p> <p>The staff did an excellent job in identifying a diverse group of competent reviewers.</p>	

A.3 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE³, OR DATA NOT AVAILABLE
<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p>Comments:</p> <p>While there was some variance in the quality of projects, overall the portfolio</p>	Yes

³ If “Not Appropriate” please explain why in the “Comments” section.

<p>contained quality efforts. Especially noteworthy was the range and sophistication of the Education Research Projects, some incorporating collaborative and/or multi-method research strategies. C.f. 0714958; 0929148 and 0811728.</p> <p>These funded projects appeared to be of high quality and clear significance to the expansion of access to quality STEM instructional programs. The noted ERPs are also promising to extend the knowledge base regarding what works in recruiting and educating a diverse STEM student population. Increasingly institutions of higher education are turning to online instruction to provide broader access; the latter project investigates the impact of this modality at HBCU institutions.</p>	
<p>2. Does the program portfolio promote the integration of research and education?</p> <p>Comments:</p> <p>The portfolio does promote the integration of research and education, but only about half of the proposals had a research component, making it less clear how the overall portfolio should be viewed on this question. Clear examples of quality undergraduate research experiences and curricular integration were present in the programs reviewed and each prominently displayed innovative integration of research and education. It was less clear what should be an expectation in proposals providing supplemental instruction and other mechanisms related to student recruitment and success. While these programs sought to implement best practices, they did not contain overt research objectives. Overall the proposals funded adequately provided this balance between projects engaged in research and education integration, and those focusing on direct impact upon student recruitment and achievement.</p>	<p>Yes</p>
<p>3. Are awards appropriate in size and duration for the scope of the projects?</p> <p>Comments:</p> <p>Proposed projects were appropriately ambitious for the investments provided and the promised timeline for completion.</p>	<p>Yes</p>
<p>4. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Innovative/potentially transformative projects? <p>Comments:</p> <p>The portfolio had several noteworthy potentially transformative projects including partnerships that greatly enhance student learning opportunities.</p>	<p>Yes</p>

<p>For example, 0929165 – a Shaw University Project to develop a bio-based technology capability among minority students, incorporates a “comprehensive strategy [that] targets collaboration with high-tech universities running bio-technology programs at undergraduate (and graduate) levels and organizing of students’ and faculty visits to high-tech labs for technology transfer; enhancement of STEM faculty for teaching of biotechnology courses through training sessions with the Biotechnology Institute; invitation of biotechnology experts to Shaw to meet with students; participation at conferences and organization of an annual in-house Biotechnology Seminar as additional forum for training and for dissemination of project results; as well as regular evaluation of the project activities to ensure that the project plans are being achieved.”</p>	
<p>5. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Inter- and Multi- disciplinary projects? <p>Comments:</p> <p>Many of the larger grants showed a multi-disciplinary approach. Most of the smaller proposals read were concentrated in a single discipline, but given the size of the awards and the nature of the barriers the projects sought to overcome, focusing on a single department or sub-curriculum within a given area bodes well for success. Over the entire portfolio of projects there seemed to be fewer projects focusing on the physical sciences, but this may be an artifact of the uneven distribution of STEM programs at HBCU institutions.</p>	<p>Yes</p>
<p>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?</p> <p>Comments:</p> <p>The program portfolio had a good mix of the various HBCU-UP programs.</p>	<p>Yes</p>
<p>7. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Awards to new investigators? <p>NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant.</p> <p>Comments:</p> <p>A majority of projects funded had a new investigator. HBCU-UP PIs had an average of 1.2 NSF awards. However, since many HBCU UP projects focus on institutional change, there is a priority placed upon demonstrated institutional commitment through the participation of key administrators as</p>	<p>Yes</p>

<p>project PIs. This impacts the opportunity for new investigators in these award categories, but may also have the potential to strain the role and function; potentially creating PIs who have little direct engagement but must carry the title for funding eligibility. Staff monitoring and attention to this possibility is recommended.</p>	
<p>8. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? <p>Comments:</p> <p>The geographic balance of the projects seemed appropriate.</p>	<p>Yes</p>
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>Comments:</p> <p>The COV found few projects involving community college collaborations; increasing this might strengthen the overall program impact. For example, in FY 07-09, the portfolio showed seven awards to two-year, 70 to four-year, 70 to masters, and, 24 to Ph.D. institutions. While it is recognized that only a small number of HBCU institutions are community colleges, it is recommended that encouraging partnerships or collaborative efforts between HBCUs and non-HBCU community colleges would provide an avenue for servicing the large number of minority students who begin their academic careers in community colleges, often never matriculating to another higher education institution. Thus, while the current projects provide appropriate balance between HBCUs, a program goal should be to leverage funding of HBCUs by encouraging them to partner with other institutions with sizeable minority student populations.</p>	<p>Yes</p>
<p>10. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and sub disciplines of the activity? <p>Comments:</p> <p>The programs cover STEM fields adequately and additionally provide links between the disciplines offered and job or graduate school opportunities.</p>	<p>Yes</p>
<p>11. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>Comments:</p> <p>The majority of students impacted by the awards are African Americans.</p>	<p>Yes</p>

<p>12. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports.</p> <p>Comments:</p> <p>Yes, there were several projects that specifically referenced links to national priorities and workforce development needs. In addition, there was substantial evidence of links to regional workforce and technology development needs. The Shaw University proposal (0929165), mentioned in A.3.4, links undergraduate students.</p> <p>The programs especially address the NSF priority to be inclusive and to increase the participation of African Americans in STEM careers.</p>	<p>Yes</p>
<p>13. Additional comments on the quality of the projects or the balance of the portfolio:</p> <p style="text-align: center;">N/A</p>	

A.4 Management of the program under review. Please comment on:

<p>1. Management of the program.</p> <p>Comments:</p> <p>The program appears to be well managed.</p>
<p>2. Responsiveness of the program to emerging research and education opportunities.</p> <p>Comments:</p> <p>The solicitations have emphasized the characteristics of quality and fundable proposals. The FY 09 solicitation highly encouraged innovative, nontraditional models for undergraduate education. The program encouraged Targeted Infusion Projects that address NSF priority investment areas such as bio-complexity in the environment, climate change, cyberinfrastructure, etc. FY 09 also added a new track called Achieving Competitive Excellence (ACE). Proposals are expected to be ambitious, transformative, and far-reaching.</p> <p>FY 10 introduced three new programmatic opportunities: International emphasis, teacher education to address STEM teacher preparation, and disadvantaged male issues that hinder success in STEM. These are all high priority issues that need to be addressed by appropriate programs.</p>

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

Comments:

The program appears to be responsive to the perceived needs of the program applicants, and the portfolio evolves accordingly. We perceived that there is strategic management of the portfolio across the tracks.

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

Comments:

The program responded effectively and appropriately to the 2007 COV Report. New program tracks were introduced in response to recommendations from the COV.

5. Additional comments on program management:

Comments:

It appears that the program is understaffed for the work load involved. This conclusion is drawn from the challenges identified by the program staff, including the impact of the increased portfolio size, the impact on the ability to conduct site visits and the need to contract for more technical assistance. A serious look at staff levels is critically needed.

The proposed consolidation of HRD programs into a Comprehensive Broadening Participation of Undergraduates in STEM (CBP-US) Program **should not be implemented** because it will have a detrimental effect on HBCU-UP. As documented by the Urban Institute evaluation, HBCU-UP is of high quality and is greatly contributing to the number of minority STEM graduates. There appears to be no compelling reasons for NSF to consolidate a highly productive program. It is believed that consolidation will result in the loss of identity of the program and will most likely result in a decrease in NSF funding for STEM programs at HBCUs.

PART B. RESULTS OF NSF INVESTMENTS

The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship, although the COV does not review accomplishments related to Stewardship.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

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.”

Comments:

HBCU-UP projects are not designed to make major contributions to state-of-the-art research in science and engineering, but do contribute to the knowledge of how to effectively educate and graduate African Americans in STEM disciplines, and encourage significant numbers to pursue PhD studies. ERPs have added substantially to the discovery productivity of HBCU UP. Integration of the findings from these projects in creating a theory of change would be a useful addition to the program. C.F 0714958, 0714963, 0811728 and 0811453.

B.2 OUTCOME GOAL for Learning: “Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.”

Comments:

The HBCU-UP projects are effectively contributing to increasing the number of minorities, especially African Americans, who graduate in a STEM field, work in a STEM area and attend graduate school in a STEM discipline. Minority students who attend an HBCU are much more likely to major in and graduate from a STEM discipline than minority students attending majority institutions.

There is evidence from funded projects that HBCU-UP is generating useful information towards cultivating a world-class, broadly inclusive science and engineering workforce. As one illustration, **HRD 0714930 at Norfolk State University** has been awarded funds to take a model developed at the graduate level and extend its relevant components to undergraduate recruitment, retention and instruction. This project additionally incorporated outreach to three local high schools and a community college system.

We saw examples of quality outreach; the committee is surprised that more outreach programs to K-12 are not embedded within the HBCU-UP program. In one proposal, **HRD 0929165 at Shaw University**, [...] outreach training activities for middle school youth and middle school science teachers [have] the potential to provoke early interest by students in bio-based technology. [The COV noted] the goal of Shaw University to develop four new bio-technology courses, and to redesign and enhance two existing courses, increase research training which is coupled with interdisciplinary course development, mentored research experiences and entrepreneurial training. [The COV noted] that the curriculum improvement plan is creative. [...] The innovative program design of this application extends beyond traditional research training methodologies. [The COV noted] that in addition to laboratory experiments, students will visit local industry to engage in practical training, STEM faculty will receive professional development in bio-technology instructions and methodologies, which were thought to be good project components; the science component is very well conceived and organized.

The HBCU-UP programs should continue to encourage outreach efforts to K-12.

[NOTE: NSF has made minor redactions in this paragraph, denoted by [], to ensure that it conforms to NSF policies on confidentiality.]

B.3 OUTCOME GOAL for Research Infrastructure: “*Build the nation’s research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.*”

Comments:

The proposals include significant attention to partnerships and collaborative ventures that enhance student access to existing state-of-the-art research infrastructure for teaching. This access seems imperative to prepare students to benefit from other partnerships. Without an opportunity to train on state-of-the-art equipment and procedures, students will not be in a position to take advantage of exposure arranged by institutions.

HBCU-UP programs provide modest support to strengthen the scientific infrastructure of HBCUs. Given the importance of HBCUs to the Nation’s ability to meet its human resource needs in STEM areas, a greater investment here is needed to ensure that graduates have state-of-the-art training and that faculty has the tools needed to contribute to the research enterprise. Additional NSF investment in providing equipment, facilities, cyberinfrastructure and advanced instrumentation is critical to ensure that this quality basic instruction occurs.

PART C. OTHER TOPICS

FINAL CROSS-TALK SUMMARY

SUMMARY OF BUNDLED HRD COV CROSS-TALK REMARKS September 2, 2010

A group of COV review team members came together from 5 separate teams on September 2nd to discuss their differences in program perspectives, to find synergies that exist among the programs, and to identify mutual areas of concern that can help gain leverage and traction in broadening participation and increasing program effectiveness. The team members reviewed and evaluated the AGEP, CREST, HBCU, LSAMP, and TCUP programs before joining forces and sharing their views at the cross-talk session. Members were enthusiastically in alignment with anticipating the changing national education needs, encouraging collaboration and communication, and accelerating participation in global enterprises. The following summary represents major concerns of the assembled group.

- ❖ **Linkages/feedback mechanism across organizational lines:** The COV panel advocates improved linkages among the programs in HRD, and encourages the use and sharing of tracking and feedback mechanisms used by the programs.
 - A recommendation emerged that any awarded proposal should have the approval of the external review panel regarding its proposed broadening participation emphasis.
 - Several participants want to see more successful, collaborative efforts with other NSF programs, other agencies, National Laboratories, private industry, private foundations, and entrepreneurial research from small companies.
 - The group encourages private-public partnerships to facilitate technology transfer.
 - While use of Ad Hoc reviewers is an acceptable practice, the COV found that mainstream reviewers had more experience and seemed to do a better job. One suggestion to NSF is to provide a clear example of what a strong review looks like to facilitate better quality reviews.
 - Tracking of projects is sometimes difficult when the work ends. The team recommends practices that encourage sustainability and support for the projects.

- ❖ **Leadership Transition at the Top:** With new leadership coming in the opportune time exists to propose new methods of doing business. Panelists suggested that it is time to refine/restate NSF's commitment to BP. Some members recommended that NSF assess their structure to see if it promotes or discourages BP.
 - The panelists encourage the new Director of NSF to engage the affected community of institutional leadership and researchers in the first 90 days. Participants felt that by early engagement in the major concerns of the community, the first 90 days would make it possible to at the very least reinforce and/or establish a framework to meet objectives.
 - Considerable discussion revolved around which agency is best qualified to take the lead in managing a national education agenda. Besides NSF, the panel suggested National Institute of Health (NIH) with its very large budget, the Department of Education (DOE) which they did not feel has the needed clout and the Department of Defense (DOD) as possible candidates. The panel suggested that leadership belongs with NSF which is well-positioned to take advantage of leveraging

opportunities between agencies. With a formal leveraging mechanism in place, more opportunities to fund education would be possible. The NSF could consider developing a position called the Director of Integration to coordinate leveraging.

- IGERT represents a successful example of different directorates working together and cutting across the institutions as a flagship of graduate education. Panelists recommend identifying more programs like this that fund not just hard sciences but also social sciences to actually promote interdisciplinary education and thereby broaden participation.
- Encouraging collaborative grants with other institutions/organizations and/or companies may greatly expand and leverage the work across many programs and institutions.
- Developing leadership skills provides not only resources but also the type of leverage that enhances partnerships.

❖ **Broadening Participation:** Put teeth into it in the review process; identify a clear definition in the Strategic Plan that outlines goals and strategies for broadening participation.

- Consider using individuals who participate in programs and panels as mentors. Panels teach others how to do a better job of writing new proposals.
- A number of participants identified a need to increase the presence of minorities on panels.
- Generate increased participation from those who have been excluded from awards, grants, and fellowships over the years, particularly in STEM areas.
- Broader participation could come not only from giving others the opportunity to see what it is to develop an excellent proposal but also from obtaining diverse viewpoints from panelists.
- Develop a stand-alone section in standards that speaks to Broadening Participation so that it is not necessary to dilute what you emphasize in the science section.
- Several COV team members support the model of a separate panel or ad hoc reviewers to ensure that BP receives proper commentary and that PIs understand the need to incorporate it. The significance of the panel input drives the level of funding as determined by the scientific review, and appropriately, funds are not released until the criterion has been met. Be sure that panels have the expertise to deal with broadening participation and speak strongly to it.
- The funding structure should work to broaden participation rather than hinder it; if funding criteria are too bureaucratic, the result is a negative effect. The concern is that NSF does not have a mechanism in place that would allocate funding unless every piece of the proposal was rewritten to reflect a significant number of smaller proposals.
- Broadening Participation as a required criterion would also be appropriately included at the annual review stage and clearly addressed before the release of continuing grant increments.
- The panel asks which broad impacts NSF wants and further suggests setting standards and achievement metrics that NSF will examine yearly.
- Members suggested that NSF include reviewers who can do a critical analysis of broader impact. Most of the focus seems to be on intellectual merit.
- Improve communication between programs/agencies/organizations to strengthen alliances and make use of existing resources.

- ❖ **Structure of NSF – does it help or hinder Broadening Participation:** The consensus of the HRD COV Teams is that NSF should not consolidate these five programs. Other concerns emerged that ask whether NSF had a role in determining what is in the best interest of the country to leverage and improve on education.
 - Objections have been raised over proposed consolidation of the HRD programs. From a financial standpoint, some panelists feel that putting all the grant money in one pot is going to be a detriment especially to HBCU and TCUP and that the funding structure is short-sighted with the possibility of backfiring on the goal of broadening participation.
 - While the group recognized that human capital resources in some programs showed an increase since the time of the last program evaluations, a suggestion emerged to increase staffing to better manage programs and strengthen opportunities to meet goals for BP and BI.
 - A focus of new hires in specialized areas would allow for an increase in site visits by PIs that adds value to assessing programs, hiring individuals with experience in techniques for broadening participation increases the chance for achieving BP goals, and hiring someone at the executive level with expertise in leveraging opportunities among key parties/agencies.
 - Concerns emerged in discussions that smaller institutions don't have the sophistication to compete with larger institutions and if programs merge, the communities with small institutions will "hear" a message that the federal government doesn't care, and they fear loss of identity.
 - Talk to affected parties before making the organizational and funding changes that are going to generate long-term consequences.
 - Even with structure that has to be addressed and realigned, and with internal problems that have to be solved, the NSF is the ideal agency to carry the banner and lead the national initiative to improve the quality of research and higher education.
 - The incentive is there for NSF to emerge as a leader and to get creative to generate and leverage diverse funding pools.
 - The panelists would like to see NSF become an advocate of change – emerge as the federal "Change Agent" in pursuit of advanced education and funding resources.

- ❖ **Allocation of Resources:**

- Look for ways to fund infrastructure development that includes equipment and laboratories or a way to leverage program resources with other NSF opportunities.
- Put funds directly into supporting students and personnel without taking away from the dollars set aside for research-related expenses.
- Find a way to train students to become active members of faculty by learning how to write proposals, develop networks, and engage with people to expand partnerships and innovative research.
- Set aside funding for information technology tools along with the training to work with new software so that emerging science moves into the next generation with quality results and smooth transitions.
- To ensure that programs are sustainable provide increased support so that you can measure outcomes.
- Look for innovative programs that cultivate entrepreneurial students and programs. Students want to know how they can earn a living, make money and enjoy their work. Without the incentive, they may choose other options that have less satisfying results.

- Consider engaging with private industry to forge partnerships that support internships for students within the organization. Identify success stories where these partnerships have worked.
- ❖ **Demonstrate the Effectiveness of the HRD Programs:** A number of participants believe that NSF programs have a weak system for disseminating information on the successes coming out of these programs. Panelists feel that more investment of funds in NSF programs would be possible if a plan to attract other organizations was in place. Members advocate strengthening the information pipeline and generating national publicity for program accomplishments.
- Use simple graphs; convince people on the outside with presentations that are simple and straightforward.
 - Publicize accomplishments of note; even consider putting ads in major media outlets
 - Consider engaging the services of public relations firms to create interest in investors that have the resources to fund programs.
 - Tell other institutions what we do, that NSF looks for opportunities to engage in collaborative grants and are looking for partnerships and new funding sources to advance education globally.
 - Widely disseminate information on best practices to share information at the national level.
 - Get the attention of the internal press, the Office of Legislative and Public Affairs, and ultimately the media to put the spotlight on successful NSF programs.
 - Develop data bases and target groups to share program information.
- ❖ **Role of the National Science Board:** Some discussion came up about how the National Science board can set priorities with respect to addressing BP and hold programs responsible for addressing it or do without funding. Perhaps this is an enforcement role for NSB.
- Revisited the discussion regarding the possibility of weighting the merit review criteria.
 - Members were in passionate agreement that the composition of the National Science Board needs more diversity.
 - Broadening impact has to be evident throughout the structure including the National Science Board.

HBCU-UP COV COMMENTS

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

Across the Portfolio

- ❖ Intra-agency communication and collaboration between LSAMP and other NSF programs (e.g. REU, STEP, OISE) should be more explicitly emphasized and encouraged.

Program-Specific

- ❖ Sustainability requires a substantial investment over time and reflects institutional priorities as well as their level of resources. There is a reluctance to switch over to new projects when there are familiar areas that still need attention. It is important to balance the sometimes conflicting goals of increasing the reach of the program and fostering sustainability. Additionally, the award size for implementation grants is insufficient to result in substantial improvements in STEM areas.
- ❖ Worries remain about the quality of science education. It is important that students are trained to use state-of-the-art equipment to remain competitive. Therefore, institutions must be adequately funded so that they are able to acquire the necessary equipment to establish and/or maintain high-quality programs. With respect to already established universities, implementation grants are needed to improve, replace, advance, and build upon what is already in place.
- ❖ The literature on best practices for educating and graduating AAs at HBCUs is neither widely nor readily available. HBCU-UP could make use of the OERL evaluation research library to report findings, lessons learned, and best practices.
- ❖ NSF should fund a component focusing on dissemination that includes how to distribute beyond the traditional paper/peer review/publication format.
- ❖ Encourage collaboration with the social sciences, for instance partnerships with SBE.
- ❖ There is a gap in proposals from the physical sciences at HBCUs. Can a grant be established that specifically targets underrepresented sciences, such as physics, at HBCUs?
- ❖ To address the pipeline challenge, can NSF invest more money in outreach activities at colleges and universities who target STEM instruction in middle and high schools? It is important to attend to those transition points so that students do not seep out of the STEM pipeline.
- ❖ The NSF-DOE partnership was very successful. Could this model be replicated with other research centers at other government agencies (e.g. NASA, NOAA, and NIST)?

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.

Across the Portfolio

- ❖ How robust are the Directorate's databases that track demographics and other data on programs' target populations? Is the Directorate's use of money and performance evaluated with respect to those numbers?

Program-Specific

- ❖ The Urban Institute program evaluation was well-done, informative, and speaks to the program and projects' successes.
- ❖ The development of both common and project-specific metrics and outcome measures are necessary for monitoring and evaluating projects. While rates of students going into the field are an important and interesting impact, this is only one measure of project success. Additionally, depending upon the age of the project, this metric may not be a very good indicator at all. Therefore, while universal program-specific metrics are necessary, there is also a need for project-specific measures that will be more sensitive to project-specific impacts.

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

Across the Portfolio

- ❖ The Foundation should assess the extent to which each directorate is involved in advancing the Broadening Participation (BP) agenda and take corrective steps where appropriate. Preparing a yearly report on the progress in this area to share what strides other programs are making in BP would be informative and useful.
- ❖ The COV recommends that solicitations from other NSF programs encourage collaboration with HRD programs.
- ❖ Electronically-assembled panels should be established to ensure that proposals recommended for funding fulfill BP criteria.
- ❖ BP has an enormous agenda and the majority of the responsibility to carry out this agency-wide initiative is being placed on the smallest directorate with the least amount of resources, the Directorate for Education and Human Resources (EHR). While EHR is well-suited to provide leadership, all of the directorates should participate in fulfilling this directive. NSF policies with respect to BP should reflect that it is an agency-wide commitment and the Foundation needs to be clearer about what is expected from the various directorates.
- ❖ A more rigorous definition of BP is needed. In order to provide leadership on this issue, NSF should have explicit merit review procedures associated with the BP component of proposals.
- ❖ PIs should be provided with more information regarding the BP aspect of the merit review process. Additionally, the BP portion of the merit review process should be addressed separately in some way. For instance, one person from each panel could look specifically at the BP-related award components. Ultimately, a separate review is the best way to proceed.

- ❖ Make BP a more explicit part of future metrics and assessment so that accountability is built into BP goals.

Program-Specific

- ❖ Apply the NSF-DOE partnership model to HBCU-UP.
- ❖ More partnerships should be forged between HBCUs, major research universities (MRUs), and community colleges. Connect projects that build independent partnerships between MRUs and HBCUs (e.g., Vanderbilt and Fisk partnerships) to form a network of partnerships.
- ❖ Major grants that go to Tier I Research Institutes could incorporate a bridge program that reaches out to HBCUs and their students to offer research experiences and other academic resources. Research grants ought to have a component built in that encourages/mandates minority students' participation in research under the grant.
- ❖ The resources currently allocated to EHR for its BP efforts are already stretched thin. They may be stretched even thinner by the potential centralization of BP programs and addition of a component focusing on HSIs that is not accompanied by any increase in allocated funding. This would lead to fewer resources for all programs.

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

Across the Portfolio

- ❖ Mandate BP within the Broader Impacts criterion and develop associated implications for non-compliance.
- ❖ Identify ways NSF can partner with government and private entities to pool resources to broaden participation.

Program-Specific

- ❖ NSF should look into how the culture within STEM fields drives certain students away; perhaps, through individual PI research projects. The findings may provide insight into how to increase BP. For instance, why do students gravitate toward the biological sciences and stay away from physical sciences? Cultural impacts/decisions drive the divide, in part, and the research in this area might be useful in determining a redirection of more students towards the physical sciences.
- ❖ More attention needs to be given to elementary and secondary education to encourage access and success. Teachers need to return to a place of respect and be treated as professionals to encourage students to become teachers and teachers to engage their students.
- ❖ Also, keep an eye on the stature of the STEM professoriate such that one-year, temporary adjunct appointments do not become the standard with which STEM education is taught.

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

Across the Portfolio

- ❖ Provide systematic training in the steps to be used in extracting programmatic data.
- ❖ The off-site processes allowed the COV to concentrate on the specifics of the program and helped the group cover the materials and come to agreement more quickly.
- ❖ The links and PDFs embedded in the PowerPoint presentations increased accessibility to the materials.
- ❖ In a bundled COV, it would have been nice to touch base with the other programs prior to the cross-talk discussion. Being isolated from each group limited the potential benefits of a more diverse pool of ideas.
- ❖ It is difficult to reconcile the concerns put forward by individual sub-panels into a single document. Some recommendations/concerns may be diluted by other sub-panel observations.
- ❖ Sub-panels may have experienced an unequal emphasis in preparation for the COV, which led to logistical problems.

Program-Specific

- ❖ From an informational perspective, this was the best COV. The PowerPoints were usually given at the meetings as opposed to being available beforehand – this really helped.
- ❖ A bundled COV is appropriate for programs of this size; however, with larger programs a bundled COV would be very challenging.
- ❖ The COV Template can be challenging because of the agency-wide template's rigidity. It would be ideal if the template acknowledged the unique nature of the HBCU-UP program.

SIGNATURE BLOCK:

For the HBCU-UP COV
James Renick
Chair

William B. DeLauder
Sub Chair