

Staff Response to the Committee of Visitors (COV) Report

Informal Science Education Program

Committee of Visitors Meeting, September 12-13, 2011

Integrity and Efficiency of Program's Processes and Management

I. Questions about the quality and effectiveness of the program's use of merit review process.

I.1 COV Recommendation: The COV raised two minor issues about the review process. The committee encourages more discussion about program criteria at the onset of panels, as well as consistency in informing reviewers that they may adjust their ratings as part of panel discussions, in compliance with NSF panel rules. Also, the rationale for clarifications requested as part of the negotiation process should be clearly stated.

Response:

DRL and the ISE program have instituted a number of practices to ensure that panelists are well prepared to serve on review panels. First, a Reviewer Guide is sent to each panelist which explains the NSF merit review process and cites relevant sections of the ISE solicitation as well as how to apply the two major NSF Merit Review criteria. Second, reviewers are invited to participate in an Orientation Webinar prior to each panel. The orientation process addresses NSF requirements such as conflicts of interest and confidentiality, as well the merit review process. Finally, once on site, reviewers are again provided with a brief overview of the merit review process and given an opportunity to ask questions, both in the group orientation and also in individual subpanels. Reviewers are advised that they may modify ratings until the completion of the panel. Once the panel ends, no further adjustments may be made.

The negotiation process with Principal Investigators (PIs) is typically conducted via e-mail, although discussions may also occur via telephone conversations between the Program Officer (PO) and the PI, all of which are documented in the electronic jacket. The PO may ask for more information at any time during negotiations based on panelist comments and internal program recommendations. The PI has full access to the reviews and panel summaries following the negotiation process. The program will continue to discuss the negotiation process and emphasize consistency in documentation.

I.3 Recommendation: To ensure that panel reviews are detailed, the COV suggests that reviewers be required to address each subsection of the NSF merit review criteria.

Response:

As indicated in the prior response, the panel orientation provides detailed instruction on the composition of a proposal review and encourages reviewers to provide comprehensive and detailed responses to the merit review criteria as appropriate, based on their background and expertise. The program will continue to encourage reviewers to fully address all sections of NSF merit review criteria and subsections of each criterion that are based on the ISE solicitation.

I.7 Recommendation: The COV suggests that the broader impacts criterion would benefit from additional clarity as it relates to scaling, replication, and dissemination. It would also be helpful to know which proposals are resubmissions. Finally, the panel needed additional detail on how the program showed evidence of greater efficiency in proposal processing (time to final action), as well as additional examples of innovation and potentially transformative activities.

Response:

The National Science Board solicited input from the field on the broader impacts criterion during the summer of 2011. The program will provide more explanation of what is expected from the field based on any revision to this review criterion in future solicitations, especially as it relates to scaling, replication, and dissemination. Additionally, the requirement to address innovation and potentially transformative work in proposals will be clarified with links to appropriate NSF web pages (e.g., http://www.nsf.gov/about/transformative_research/). This link includes a comprehensive discussion of transformative research and examples of potentially transformative activities.

Any resubmitted proposal is given a de novo review. The only way that reviewers can determine if a proposal is a resubmission is if the PI includes a statement in the proposal summary or narrative. Because proposals can change titles, PIs, and major concepts from one competition to another, it is difficult to characterize proposals as resubmission unless the PI elects to state this in the proposal itself. The program does not regularly collect data on resubmissions for this reason.

The program regularly meets the NSF requirement for processing at least 70% of proposals within six months of submission.

II. Questions concerning program structure and emphasis.

II.1 Recommendation: The COV recommends that the ISE program develop a “top level summary” for both internal and external stakeholders that illustrates the growth and impact of the field using ISE program statistics and independent reports. The use of communities of practice and networks to obtain input from the field on innovative and cutting edge practices is also

highly recommended, as is the convening of expert panels to ensure the viability of any recommendations. Research and evaluation frameworks are one area that would benefit from a meeting of a community of practice.

Response:

The program is pleased to report that some elements of the COV recommendation have already been implemented through the work of the Center for Advancement of Informal Science Education (CAISE), which supports ISE awardees. For example, the 2012 ISE PI meeting will build on a set of workshops which draw on the expertise of communities of practice and networks.

Workshops planned include sessions on media projects, organizational networks, professional development, and sustainability science education. The CAISE Inquiry Groups convened in 2008-2010 produced white papers on a variety of important topics and used a similar model. The program will continue to explore opportunities beyond the PI meeting to bring together experts to discuss topics critical to the field, including evaluation and research frameworks.

The program will also explore appropriate mechanisms to create a summary document for ISE stakeholders to inform the field about growth and impacts of the program and the field as a whole. Fortunately, a number of excellent reports and summaries have been created that address program impacts and contributions which might inform a summary document. It is anticipated that the Online Project Monitoring System (OPMS) and program evaluation will also provide additional data in future years on specific contributions of the ISE program to contribute to a comprehensive report that could target both internal and external stakeholders.

II.2 Recommendation: The COV recommends that the program consider how the panel composition will be managed in order to address the multidisciplinary nature of the proposals and the increasingly high level of panelist expertise that is required. Additionally, the program should consider future program tracks that continue to build on the existing options such as capacity building.

Response:

The program appreciates the insight of the COV panel in recognizing the complexity of proposals which incorporate multiple strategies, disciplines, and deliverables to support audience needs. Consequently, the program utilizes a number of strategies to ensure that the panels are populated with the appropriate STEM, research, and educational experts. ISE panels are comprised of researchers, evaluators, and practitioners from informal science education institutions, K-12 schools, and academia as appropriate. Outreach activities for DRL include recruitment of panelists for the ISE program, in addition to the recruitment conducted by individual Program Officers.

Panels may be supplemented with ad hoc reviews from experts who have specific STEM, research, or programmatic expertise that might not have been evident on the panel. Recommendations for panelists are sought from Program Officers throughout NSF, especially when specific STEM expertise is needed and co-funding is a possibility. Finally, Program Officers outside of ISE may serve as consultants and lend their expertise to comment on aspects of proposals in their related disciplines. Collectively, these strategies ensure that the broad pool of expertise needed to support ISE panels is available.

In future solicitations, the program will continue to include language that encourages capacity building.

II.3.a Recommendation: The COV recommends more collaboration with programs across NSF.

Response:

The program is actively collaborating with programs across NSF. For example, in FY2010 and FY2011, the ISE program provided over \$1.5 million in co-funding for projects outside of EHR. The program also received co-funding exceeding \$4.0 million from other programs during the same period, which leverages the ISE investment and highlights the broad NSF support for informal science education. Additionally, the Connecting Researchers and Public Audiences projects provide an opportunity to work directly with Program Officers in the other research directorates as we explore strategies to strengthen the existing model.

ISE Program Officers also serve on internal committees for cross-foundational investment areas on a regular basis such as Cyberlearning and Science, Engineering, and Education for Sustainability (SEES). Finally, in an effort to raise awareness about the field of informal science education, the program has sponsored a series of monthly seminars featuring ISE awardees who discuss their projects and outcomes. We will continue to seek opportunities for collaborations and partnerships in keeping with the OneNSF theme that is emphasized in the Director's FY2012 Budget Request to Congress.

II.3.b Recommendation: The program should consider research capacity building, perhaps by adding research, evaluation, and investigators in non-academic positions to project teams. The COV suggested that research can be further promoted by embedding incentives in the solicitation such as an option to obtain funding to conduct and communicate about research on a proposed or currently active project.

Response:

The program will explore strategies to incentivize research in ISE projects and continue to build on the existing research awards.

II.3.c Recommendation: Providing incentives for STEM researchers to be included on ISE projects would also expand this practice beyond CRPA projects. Recommendations for addressing big challenges were provided for cyberlearning and equity. More information is needed on demographics and geographical distribution of co-PIs and subawardees.

Response:

Awards currently include STEM researchers in a variety of roles - serving as advisors, content experts, collaborators, subawardees, and PIs. The program agrees that additional approaches can be encouraged to include STEM researchers in ISE projects, beyond CRPAs.

The NSF FastLane system and OPMS collect a variety of data on projects including geographic data on co-PIs and subawardees which can be provided to future COVs. However, demographic data is provided on a voluntary basis by PIs and co-PIs. Consequently, demographic data is limited and does not represent all awardees.

III. Questions concerning the management of the program under review.

III.2 Recommendation: The COV recommends increased investments in travel and professional development resources for workshops and capacity building efforts aimed at the diversification of the PI pool and additional professional development opportunities for Program Officers.

Response:

The Division of Research on Learning (DRL) maintains an outreach committee that is charged with outreach at major conferences and professional meetings. Additionally, Program Officers participate in webinars and NSF-funded workshops designed to reach potential PIs at minority-serving institutions. Comprehensive efforts that include workshops and in-depth sessions on proposal development aimed at prospective PIs will be explored.

Despite limited travel funds, every effort will be made to ensure that Program Officers have sufficient funds for site visits and professional development.

III.4 Recommendation: The COV reiterates its concern about the lack of broader demographic representation among PIs and suggested a capacity building effort focused on increasing the diversity of the talent pool in the ISE field, which could be carried out by CAISE or incentivized through the ISE solicitation.

Response:

See prior response to COV Recommendation III.3. The program will explore strategies to hold workshops, webinars, and other efforts aimed at diversifying the PI pool. We will determine how a capacity building effort may be incorporated into the activities of the Center for Advancement

of Informal Science Education (CAISE), assuming that the cooperative agreement is renewed in 2012.

IV. Questions about Portfolio.

IV.2 Recommendation: The COV recommends that the program consider quality of STEM in and the cost of media projects, as well as the balance of media projects in the portfolio.

Response:

The program undertakes a number of measures to ensure that the content of all proposals is vetted by STEM experts by including individuals with STEM expertise on panels, supplementing panels with ad hoc reviews, and consulting with research experts in other NSF programs. Additionally, ISE projects generally include STEM researchers and content experts as advisors.

The composition of the program portfolio is based on a number of variables including the quantity and quality of competitive proposals received, STEM content, target audience, geographic distribution and size of the submitting institution, deliverables, and funding availability. The program continues to seek balance in all areas and across all project types.

IV.3 Recommendation: The COV raised concerns that exhibit projects receive less funding than media projects. More innovation in exhibit development through experimentation with digital technologies should be encouraged. Additionally, the program should define what is meant by potentially transformative. Finally, the ISE program should provide incentives for investigators in non-academic settings to publish their work in peer-reviewed publication.

Response:

See the response to COV Recommendation IV.2 for the discussion of media projects and portfolio balance, while COV Recommendation I.7 addresses potentially transformative work. The response to COV Recommendation II.3.b indicates that the program will explore strategies to incentivize research and communication of research findings. The program will also encourage more innovation in digital technologies in exhibit projects.

IV.4 Recommendation: The COV recommends the inclusion of science of learning researchers in the pool of investigators conducting ISE-related research.

Response:

Science of learning researchers are an important part of the pool of researchers that may contribute to the knowledge base. Program staff has been expanding their conversations and collaborations with SBE's learning science programs, thus better positioning ISE to infuse more

learning science researchers into all program processes. We will ensure that this community is included in efforts targeting increased research submissions to the ISE program.

IV.5 Recommendation: The COV notes that the geographic distribution of awards could be much better, and could be supported by presentation of geographic data on co-PIs and subawardees. The committee also recommends providing incentives for incorporating co-PIs and subawardees from underrepresented regions of the country.

Response:

The program agrees that it is important to obtain data on the geographic distribution of subawardees and co-PIs which may reveal broader distribution of project impacts than indicated by the lead institution. The program will explore existing databases to obtain and provide this data for future COV meetings. We will also continue to work closely with EPSCoR to support projects that are in regions of the country not currently addressed in the program portfolio. However, it should be noted that most ISE awards are national in scope and include comprehensive dissemination plans to ensure that that models and deliverables are widely distributed. In future years, the OPMS data will be able to better document dissemination beyond the location of the grantee institution.

IV.11 Recommendation: The COV recommends that the ISE program consider funding more efforts targeting: family and intergenerational learning, diverse audiences and ELLs, and citizen science. The panel also recommends the use of networks and communities of practice to identify and solicit ideas for innovative and cutting edge practices from the field.

Response:

The program will continue to draw attention to family and intergenerational learning, ELLs, and citizen science efforts in future solicitations based on research conducted on the potential audience impacts associated with these approaches.

The program recognizes the benefits of networks and communities of practice as sources of innovative ideas and has made use of expert panels in the past to tap into this rich knowledge base. As noted in response to COV Recommendation II.1, CAISE will convene a workshop of ISE-funded network awards in November 2011 with follow-up discussions at the March 2012 PI meeting. The program will continue to explore opportunities to draw on the expertise of the field.

Other Topics

1. Recommendation: More emphasis on ELL and early childhood projects.

Response:

As noted in response to COV Recommendation IV.11, the program will continue to draw attention to ELLs as an underrepresented audience. Efforts are currently underway which may include a focus on research related to multilingual audiences as part of the CAISE Informal Commons website which will support the field with greater access to research, evaluation, and best practice resources. The program will also continue to encourage proposals targeting early childhood audiences.

2. Recommendation:

- a. Provide information on connections and guidance to broader impacts research for other NSF directorates.
- b. Monitor the impact of optional preliminary proposals on the quality and diversity of full proposal submissions.
- c. Explore strategies to enhance the CRPA awards, such as increased award size, reviewer guidance, and support for STEM research PIs.

Response:

- (a) *The program concurs with the recommendations in this area. As noted previously, a number of efforts are underway that support COV Recommendation 2.a, including monthly presentations for NSF Program Officers by ISE PIs and Program Officers on projects targeting public audiences and the evaluation/research results. Additionally, the program is currently hosting a Program Officer from the Division of Chemistry serving on a detail which will assist with the identification of appropriate broader impacts strategies for chemistry centers. The program will continue to expand efforts across NSF to share research findings and discuss methods for achieving broader impacts with public audiences.*
- (b) *An analysis of full proposals will be conducted following the January 2012 deadline to determine the impact of optional preliminary proposals on proposal pressure, quality, quantity, and diversity of submissions. If it is determined that it is feasible to continue with optional preliminary proposals, ongoing monitoring will continue to ensure that the field is not negatively impacted by this process.*
- (c) *Strategies to enhance CRPA awards have been underway over the last two years and will continue to be explored. For example, the identification of a team of two Program Officers who are the “lead” CRPA POs and efforts to work more closely with the potential PIs via NSF research centers have improved communication and support efforts. The CRPA reviewer orientation can be strengthened by making it more consistent with other DRL efforts. Finally, additional support for research PIs will continue to be developed, especially through the efforts of CAISE, including strategies for collaborating with informal science education institutions and strengthening project evaluations.*

3. Recommendation: Improve the COV orientation process and presentation of background materials.

Response:

We concur with the COV recommendations for improving the COV orientation and presentation of program background materials. These recommendations will be implemented during the next COV.