

Staff Response
To the Committee of Visitors (COV) Report
Robert Noyce Scholarship Program

COV Meeting of May 26 –27, 2005

On May 26-27, 2005, a committee of Visitors was convened to review the first three years (FY 2002 –2004) of the Robert Noyce Scholarship Program. The program staff thanks the COV members for their thorough review of the program and helpful suggestions. This response addresses the comments and issues that were included in the COV report. Responses are organized in accordance with the order provided by the FY 2005 Report Template for NSF Committees of Visitors.

Part A. Integrity and Efficiency of the Program’s Processes and Management

A.1. Regarding the quality and effectiveness of Merit Review Procedures, the COV commented that “program officers managed the review process well.” The COV commented that the dwell time of approximately 100 days was very good and 94-100% of proposals were processed within six months. The COV found that the panel summaries and program officer’s review analyses provided sufficient information for principal investigators to understand the basis for the panel recommendation. They noted (A.1.4) that in some cases individual reviews of proposals that were declined did not include sufficient information to understand the decision; however, the panel summary “generally dealt with the missing pieces.”

Response: Program staff appreciates the COV’s statement that program officers managed the review process well. Although the COV stated that the first round of reviews were conducted by mail, with subsequent proposals reviewed by panels, it should be noted that all proposals submitted under the three Fiscal Years being reviewed by the COV were, in fact, reviewed by panels. We acknowledge that individual reviews, in some cases, focus primarily on positive aspects of proposals and individual reviewers may differ in their assessment of a particular proposal; however, the panel summary, as noted by the COV, captures the panel’s discussion of the proposal and typically addresses all aspects of the proposal, including issues that may have been overlooked by an individual reviewer. In addition, as noted by the COV, the program officer’s review analysis provides additional explanation for recommendations.

A.2. Regarding the implementation of the NSF Merit review Criteria, the COV noted that the panel summaries and review analyses addressed both review criteria, but commented that review analyses should demonstrate how the criteria were used rather than “merely asserting they were used” (A.2.3). Furthermore, the COV suggested that the meaning of “intellectual merit” as it relates to the program be provided to reviewers (A.2.4).

Response:

The two merit review criteria are broadly defined in the program solicitation; however, we agree that these criteria may have different meanings for individual reviewers. Program Officers' Review Analyses similarly draw upon the several elements associated with intellectual merit and broader impact, while also commenting on the reviewers' analysis of the proposal's intellectual merit and broader impact. To facilitate the processing of proposals and to promote more consistency across programs, DUE has developed a Review Analysis template as well as a Proposal Recommendation Process document, which discusses the attributes of competitive proposals. This document is considered an extension of the Review Analysis and is so referenced in the Review Analysis. The importance of considering both merit review criteria is included in the instructions to reviewers and the solicitation provides specific elements relevant to the Robert Noyce Program for reviewers to consider as they evaluate the intellectual merit and broader impact of the proposal. We will make an effort to provide more guidance to reviewers as to how specific attributes of proposals respond to Intellectual Merit and Broader Impact in the context of the Robert Noyce Scholarship Program through the instructions provided to reviewers prior to and during panel meetings.

A.3. Regarding the selection of reviewers, the COV found that reviewers were appropriate in number, had the appropriate expertise and qualifications, and a balance in terms of geography, type of institution, and underrepresented groups. The COV suggested that more individuals could be included from Masters and baccalaureate level institutions since they may be more familiar with teacher education programs(A.3.3). Although the COV found there to be a "reasonable balance among reviewers from various segments", they suggested that most reviewers were "traditionally –educated scientists and engineers" and commented that few were from industry. They questioned whether there was an NSF standard for the composition of panels. The COV suggested involving more business representatives and Noyce students who are now teaching.

Response: Panels are comprised of individuals from a variety of backgrounds. Although many are traditionally educated scientists and engineers (peers of typical PIs and Co-PIs of Noyce proposals), panels also include education faculty, teachers, and administrators who might be involved with student admissions, financial aid, or school district hiring. We agree that the panels would benefit from including the industry perspective and we have made an effort to include more industry representatives in the pool of potential reviewers for the current competition. As the COV suggested, we are tapping the pool of former Noyce recipients who are now teaching and this year several have been invited to serve on panels. It should be noted, that many Noyce recipients themselves came from careers in industry and they provide both the perspective of industry as well as the teacher's perspective on the panel.

A.4. Regarding the portfolio of awards, the COV commented that the supported "projects certainly meet the goals of the Noyce program." The COV noted that the real cost of running a Noyce project is substantially greater than the funds awarded by NSF. They

also discussed the possibility of allowing institutions to reapply while also expanding the number of new institutions in the program.

Response: Program staff appreciates the COV's statement that projects meet the goals of the program and we agree that the real cost of running a Noyce project is greater than the funds provided by NSF. The COV's interest in allowing institutions to reapply while also expanding the number of institutions is reflected in the 2006 program solicitation, which provides for awards to new institutions (Phase I awards) as well as awards to institutions that were previously funded under the Robert Noyce Scholarship Program (Phase II awards).

Regarding high risk projects, the COV suggested encouraging more applications from "high-risk" institutions.(A.4.3) In addition, the COV noted that many of the PIs have prior funding from NSF and experience in submitting proposals and suggested more outreach and "planned marketing" of the program. (A.4.7)

Regarding the balance of geographical distribution of Principal Investigators and institutional types, the COV commented that there needs to be better representation in the northwest, upper Midwest, and Rocky mountain states (A.4.9) and better representation of HBCUs and Native American and Hispanic serving institutions and community colleges.(A.4.9)

Response: DUE continues to participate in outreach efforts that include HBCUs, HSIs, and tribal colleges in order to increase awareness of NSF funding opportunities among minority serving institutions and to increase the number of successful proposals from these institutions. The 2005 portfolio of awards expanded the geographical distribution of awards as well as representation of minority serving institutions. There are currently 9 Hispanic serving institutions and one HBCU in the portfolio of 57 awards. Similarly, through national outreach efforts, we are seeking to expand the geographical distribution of the proposal pool as well as to encourage new investigators. We will continue these efforts. Outreach efforts through national conferences for two-year colleges are designed to specifically interest community colleges and tribal colleges in the Noyce program. In addition, several Noyce awards, although made to a four-year institution, include community colleges as partners. The requirement to track Noyce scholars as they complete their teaching requirement may deter community colleges from taking responsibility as the lead institution. We will continue to encourage institutions not well represented in the NSF portfolio to identify potential reviewers. Serving on a review panel is an excellent way to become familiar with NSF programs and to learn what makes a proposal competitive.

The COV recommended holding a PI Conference. (A.4.6)

Response: A PI Conference will be held in Washington, DC on June 19-20, 2006. Participants will include PIs and Co-PIs from each funded project as well as current and former recipients of Noyce Scholarships or stipends.

Regarding the appropriate participation of underrepresented groups, the COV found this to be the case based on data submitted to the COV, however they noted that additional data needs to be collected.

Response: At the time of the COV, a Monitoring contract had just been awarded to Quantum Research Corporation (QRC) to collect demographic data from each project. This data collection will include information on underrepresented groups.

Program staff appreciates the COV's statement that "the Noyce Scholarship is relevant to the national needs to prepare mathematics and science teachers in the K-12 school systems across the country and that the program is "relevant to the agency mission in that it "enhances the delivery of mathematics and science education in the United States." The COV had no concerns about the quality of projects, but emphasized the need to address the quality of teachers in the program and suggested that this may be answered in the program monitoring and evaluation effort.

Response: The quality of the teachers produced by the Noyce Scholarship Program is an area included in each project's evaluation plan. In addition, the program evaluation, conducted through a grant to the University of Minnesota, is addressing teacher quality as well as the effectiveness of the program in producing effective teachers of science and mathematics. Furthermore, the 2006 solicitation includes an opportunity for projects funded during the first competition to submit proposals to conduct longitudinal studies of the Noyce recipients as they begin teaching.

A.5. The COV found the management of the program "in terms of selecting grantees, issuing calls for proposals, encouraging participation" to be "quite good." They expressed some concern about the evaluation. First, the COV had concerns that PIs might have difficulty collecting some of the quantitative data, particularly from past students. Second, the COV commented on the evaluation questions that might require a greater investment than the estimated amount for the evaluation grant.

Response: We first wish to clarify that there are two ongoing efforts. One is being conducted through a contract to collect data and the second through a grant to conduct an evaluation analyzing the data that is collected through the contract, but also collecting additional information through the use of evaluation instruments and case studies to address questions of teacher effectiveness and the impact of the program. At the time of the COV, only a prospectus of a proposed scope of work was available, since an award was in negotiation. The COV's comments were helpful in fine-tuning the scope of work during negotiations and an award was made in July 2005. As for the quantitative data collection conducted under the QRC contract, the draft data collection instruments were previewed by a group of PIs who provided helpful comments and led to some refinements in the actual questions included in the collection survey. The data collection began in December 2005, with close monitoring by the contractor and we have received no evidence that any PIs have had any difficulty in providing the data. The program evaluator and QRC staff associated with the Monitoring Contract will conduct an

informational session at the PI Conference to receive further feedback from PIs as well as from current and former Noyce recipients.

The COV noted that the Noyce program is guided by its enabling legislation and therefore operates within fairly tight guidelines. They suggested that “NSF staff continue to prioritize the goals of the program so that the limited resources which are put into evaluation can provide some deep answers to the really important questions.”

Response: The program evaluation has been designed to address the goals of the program, which are stated in the solicitation. As the program matures, additional resources for evaluation are reflected in the new Phase II category, which was offered for the first time in the 2006 program solicitation. Phase II is specifically for institutions that previously held a Noyce award. This category directly responds to two concerns of the COV. First, as the COV noted in section A. 4.2. of their report, consideration should be given to whether projects should be renewed and it was suggested that there be a “higher bar” for re-application. Phase II proposals are expected to show evidence of the success of the previous award that warrants additional funding. Second, Phase II effectively increases the resources available for evaluation by offering opportunities for previously funded institutions to continue to conduct evaluation studies of the Noyce graduates as they begin to teach. Phase II proposals must include plans for conducting longitudinal evaluation studies of students supported under the previous Noyce award as well as monitoring and evaluation of new cohorts of students. Proposals must include plans for evaluating the impact of the program on recruitment of teachers and the effectiveness of the Noyce recipients as K-12 teachers. It is expected that the results of Phase II studies, coupled with other project-level evaluation as well as the overall program evaluation, will contribute substantially to our knowledge of the impact of the Noyce Scholarship

The COV suggested the use of marketing tactics to publicize the program. This topic was also discussed in part C of the report.

Response: There are two levels of promoting awareness of the program. At the project level, successful proposals include strategies for promoting interest in teaching and awareness of the availability of scholarships. Individual projects may use resources provided by the institution’s Public Relations or Admissions Office staff who use marketing strategies to target prospective students and donors. At the program level, we rely on NSF-wide efforts and outreach to inform prospective proposers about the program. This includes encouraging people to register for email notification of Program Solicitations through “MyNSF” as well as outreach efforts previously discussed. The issue of marketing the program to the larger audience of prospective awardees as well as marketing aspects of individual projects will be a topic for discussion at the PI Conference. The idea of enlisting the services of a marketing firm is an interesting suggestion, however, the current legislation authorizing Noyce does not explicitly allow for expenditure of program funds for this purpose.

Part B. Results of NSF Investments

The COV provided examples of how the program is addressing the Outcome Goal for People. (B.1) They commented that, as an implementation program, the Noyce program does not have a primary emphasis on “ideas”.(B.2)

Response: Although, as the COV noted, the Noyce program most closely responds to the Outcome Goal for People, individual awards reflect a variety of strategies (ideas) for recruiting, preparing, and supporting new science and mathematics teachers.

The COV commented that Noyce is one of several programs that recruit more students into teaching and suggested that a tool might be developed to evaluate the effectiveness of all the programs; however, they noted that the development of such a tool is beyond the scope of the Noyce program.(B.3)

Response: The Noyce Scholarship Program is the only program at NSF that focuses on the recruitment of students into teaching, although other programs, for example the Math and Science Partnership program and the Teacher Professional Continuum program, may include teacher recruitment as one of several activities addressing teacher quality and quantity. Although the development of a common tool for evaluating the effectiveness of teacher recruitment efforts may be beyond the scope of the Noyce program, the instruments developed for Noyce project and program evaluation may be of use to other programs. To this end, we expect projects to disseminate their results through publications and national conferences so others may benefit from the methodologies used. In addition, the PI Conference will facilitate the sharing of instruments and exchange of ideas across projects.

Part C. Other Topics

C. 1. The COV identified an area of improvement regarding the marketing of the program and suggested engaging a marketing firm or school to coordinate national marketing: *“While we recognize that NSF officials do present this program at some national meetings, these presentations are usually part of a more blanket presentation that covers many of the different NSF programs. We would suggest that announcements of this program appear in newsletters of organizations that appeal to the deans of schools of education, deans of arts and sciences, and the like.”*

Response: We share the COV’s interest in publicizing the program and will explore the possibility of including announcements in suggested newsletters and other publications that will reach a larger audience of potential PIs. We are pleased that the number of proposals has steadily increased each year. So far, annual increases in the budget have kept pace with the increase in proposal enabling the overall success rate to remain around 30%. As stated previously, the authorization language prescribes the use of program funds; therefore, investing program funds in a marketing firm might not be feasible.

C.2 The COV commented that information on evaluation was found in annual reports, but a comprehensive evaluation effort is needed. They stated: *“The goals of this program are really rather unlike the goals of most of the other NSF programs with*

which we are familiar. There is in the enabling legislation, a commitment to actually producing something -- an increase in the number of K-12 STEM teachers produced in a particular way. But the current evaluation mechanism does not really permit NSF managers to determine in more than a superficial way whether this goal is being met. It is possible to count the number of graduates from the program, but following up whether they actually stay in teaching and are more effective teachers than others is a much bigger task. “

Response: Two efforts are in progress to evaluate the impact of the Noyce program. At the time of the COV meeting, a Monitoring Contract for collecting quantitative data had just been awarded to Quantum research Corporation (QRC) and the COV acknowledged this was a “significant step forward”. However, this contract is only part of the program monitoring and evaluation effort. A grant to the University of Minnesota, under negotiation and therefore not available to the COV at the time of their meeting, was awarded in July, 2005 to conduct a comprehensive evaluation of the Noyce program, addressing many of the concerns raised by the COV, including teacher retention and teacher effectiveness. In addition, the 2006 program solicitation includes an opportunity (Phase II category) for institutions that previously held a Noyce award to seek funds to support longitudinal studies of students who received Noyce scholarships or stipends and have begun teaching. Recognizing that the significant evaluation questions regarding teacher retention and the impact of Noyce Scholars on the students in their classrooms extend beyond the duration of the original Noyce award, the Phase II category provides funds for such studies. Phase II studies, project level evaluation, and program level data collection and evaluation efforts comprise a multi-pronged approach to evaluating the impact and effectiveness of the Robert Noyce Scholarship Program, well beyond simply counting the number of teachers produced.

Regarding the monitoring project, the COV stated: *“The monitoring project to gather quantitative data, described in the RFP and response from the Quantum Research Corporation (QRC), is a significant step forward, but even here we have some recommendations for the future. Data gathering should be seen by the PI's as an important job for them from the beginning of their projects. It does not, for example, make sense for them to try to reconstruct how many preservice high school science teachers graduated from their university four years ago, when they submit a final project report. They, or someone they pay, should be gathering these data on an ongoing basis.”*

Response: We agree that data collection should be ongoing. The Monitoring Contract is designed for annual data collection. For start up purposes, it was necessary to collect baseline data from each project. This has not been a problem. In fact, most awards included such baseline data in their proposals or submitted the data during negotiations.

The COV further stated : *“While we were impressed with the kinds of questions being asked of the anticipated evaluation project, where the committee’s knowledge at the time of its meeting was that a contract is likely to be awarded in June 2005, we do not know any of the details about how the selected contractor is actually going to carry out the work. With the qualitative evaluation efforts as well as the quantitative evaluation*

efforts, there is the potential that there will be considerably more asked of the local PI's, who receive relatively little compensation for their efforts. “

Response: As indicated previously, we have every indication that the data collection is going smoothly. PIs had an opportunity to comment on the proposed surveys. The monitoring contract includes substantial customer support for the users and NSF staff is consulted if PIs have difficulties in providing the data. The evaluation effort is being funded through a grant, not a contract. The Evaluation grant will be a collaborative effort across all projects. Both the evaluator and the Monitoring contract staff will attend the PI Conference to discuss the program monitoring and evaluation activities, receive feedback from the PIs, and answer questions.

C.3 The COV commented that two issues identified in the report, specifically evaluation of teacher recruitment efforts and marketing, have relevance for other EHR and NSF programs: *“Two of the issues that we have commented extensively about qualify as agency-wide issues, or at least are issues that cross-cut through a variety of EHR programs.*

(1) Evaluation of programs that promote teacher recruitment: There are a variety of programs that the NSF is, or has been, associated with in order to expand the pool of recruited teachers. Many of the questions we are asking (see sections A.5.1, C.2, and a brief mention in B.3) are questions that are probably relevant to other programs, at least ones that exist within the EHR Directorate.

(2) Marketing of the program (described in sections A.5.3 and C.1) While the NSF website certainly makes information about this and other programs available to anyone who visits it, there is still a need to encourage more people to actually go visit it and become involved in the NSF process by becoming proposal reviewers, unsuccessful proposers, and, ultimately, successful proposers.”

Response: We agree that these two issues cut across NSF programs. In terms of evaluation, an EHR evaluation group has been established to consider issues of program evaluation across all EHR programs. This will facilitate the sharing of evaluation methodologies and may lead to more uniform approaches to program evaluation. We agree that marketing programs could be considered an NSF-wide issue. The COV rightly observes that there is a need to encourage more people to visit the NSF website, to become part of the review process, and eventually become successful proposers. NSF recently revised the Custom News Service to a more user friendly MyNSF and we encourage people to subscribe to this service to keep on top of NSF programs. In addition we encourage individuals from institutions not well represented in the program portfolios to serve on proposal review panels.