

**Report of the**  
**Committee of Visitors (COV)**  
**For the Research on Learning and Education Program (ROLE)**  
**Directorate for Education and Human Resources (EHR)**  
**Division of Research, Evaluation and Communication**  
**April 15-16, 2002**

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**FY 2002 REPORT TEMPLATE FOR  
NSF COMMITTEES OF VISITORS (COVs)**

**Date of COV: April 15-16, 2002**

**Program/Cluster: ROLE**

**Division: REC**

**Directorate: EHR**

**Number of actions reviewed by COV: ~50**

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

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged. Please do not take time to answer questions if they do not apply to the program.

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

<p><b>QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES</b></p>	<p><b>YES, NO, or DATA NOT AVAILABLE</b></p>
<p>Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)</p> <p>Comments: The review mechanism is appropriate. Panel reviews are dominant; diversity of panels is a strength, as are published schedules, pre-proposal review, and judicious use of site visits. Feedback by panels helps to improve promising but flawed proposals, and to retarget and refocus them when appropriate.. Panels are especially important for integrating widely different expertise of panelists that may lead to different opinions and ratings.</p>	<p><b>yes</b></p>
<p>Is the review process efficient and effective?</p> <p>Comments: Program staff supports positions and expertise of panel. There is a good process of negotiations. Pre-review of proposals by staff results in the appointment of balanced panels and a review process that is more efficient. Review process has much thoughtful input beyond yes-no decision, resulting in improved work.</p>	<p><b>yes</b></p>
<p>Is the time to decision appropriate?</p> <p>Comments: Timeliness of decisions is impressive, especially in light of</p>	<p><b>yes</b></p>

<p>extensive negotiations. Only exceptions were for negotiations with some PI's or for institutional IRB's. Negotiations with PI's generally were launched within five months of the deadline date published in the ROLE solicitation or, in the case of unsolicited proposals, the submission date.</p>	
<p>Is the documentation for recommendations complete?</p> <p>Comments: Documentation is very impressive. Paper documentation is not always consistent or complete. However the documentation was extensive, including informal communication.</p> <p>The COV supports and encourages the move towards less paper. Electronic infrastructure for this program is very good. Future COV's should have electronic access to jacket materials.</p>	<p><b>Yes</b></p>
<p>Are reviews consistent with priorities and criteria stated in the program's solicitations, announcements, and guidelines?</p> <p>Comments: In general, reviews are consistent with announced priorities and criteria of the program.</p>	<p><b>yes</b></p>

Discuss issues identified by the COV concerning the quality and effectiveness of the program's use of merit review procedures:

Panel review is an important forum for professional development and community capacity building, for both panelists and applicants. The review process provides a mechanism for the development of a scientific community for education. As such, it is important that panels be selected in a way that distributes this opportunity equitably across the scientific community.

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

Provide comments in the space below the question. Discuss issues or concerns in the space below the table. (Provide fraction of total reviews for each question)

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	% REVIEWS
What percentage of <i>reviews</i> address the <u>intellectual merit</u> criterion?	100%

<p>What percentage of <i>reviews</i> address the <u>broader impacts</u> criterion?</p> <p>Practically all, but in some cases of individual reviewers this component was superficial.</p>	<p>About 80 %</p>
<p>What percentage of <i>review analyses</i> (Form 7's) comment on aspects of the <u>intellectual merit</u> criterion?</p>	<p>100%</p>
<p>What percentage of <i>review analyses</i> (Form 7's) comment on aspects of the <u>broader impacts</u> criterion?</p>	<p>100%</p>

Discuss any concerns the COV has identified with respect to NSF's merit review system.

Review comments about broader impact often address longer-term potential or expected impact after the work is completed, rather than direct impact of proposed activities, e.g., involvement of under-represented groups. If proposed ROLE research succeeds, its longer-term impact generally has potential to be much greater than the direct immediate impact of the proposed activities. However, this potential impact has a concomitantly higher risk of not materializing.

Another concern expressed by some COV members was the risk of pressure for premature dissemination of materials and other research products without adequate validation.

Some COV members suggested development of publicly available tools that would build research capacity in the education community. These would include a database of research materials and analytical research tools like those for the analysis of classroom videos.

The COV agreed that both the "intellectual merit" and "broader impact" criteria should be tailored to the ROLE program to fit its research orientation along the path from basic research to widespread implementation.

Some COV members favored modifying FastLane to let reviewers enter mixed ratings such as "VG/G", a practice afforded by paper reviews. Reviewers attached to this practice miss it.

The program officers appear to play the most influential role in the case of proposals "on the bubble" between clear acceptances and clear declinations. The quality of these decisions depends on the breadth of vision of the program officers, which should be supported by continuing personnel development. Current activities commendably favor this goal.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space below the table.

<b>Selection of Reviewers</b>	<b>YES , NO Or DATA NOT AVAILABLE</b>
<p>Did the program make use of an adequate number of reviewers for a balanced review?</p> <p>Comments: The program usually used more than NSF's minimum of 3 and often as many as 5 reviews – appropriately given the multidisciplinary nature of the proposed research</p>	<p><b>yes</b></p>
<p>Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>Comments: Review panels included key leaders in relevant fields and a mix of scientists and educators, junior and senior researchers, and university and industry experts.</p>	<p><b>yes</b></p>
<p>Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?</p> <p>Comments: Reviewers were from widely different disciplines, and appropriately balanced with males, females, and underrepresented minorities from university, industry, and other educational organizations. It was not always possible to discern whether the composition of individual panels reflected the desired balance.</p>	<p><b>yes</b></p>
<p>Did the program recognize and resolve conflicts of interest when appropriate?</p> <p>Comments: NSF staff treats this issue with the utmost care.</p>	<p><b>yes</b></p>

<p>Did the program provide adequate documentation to justify actions taken?</p> <p>Comments: Rationales are very clear and coherent.</p>	<p><b>yes</b></p>
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Discuss any concerns identified that are relevant to selection of reviewers in the space below.

Distribution of expertise inevitably leads to jeopardy for multidisciplinary proposals. Discrepant ratings of such proposals sometimes fall along disciplinary lines. Multidisciplinary proposals provide extra targets for reviewers to criticize, for example on grounds of ignoring the literature in their particular domain. The latter was observed in at least one of the proposals reviewed by the COV. Reviewers who fault proposals for ignoring literature in a particular area should be urged to include specific pointers to key work in that area. The program officers appear to be doing their best to provide a balanced view in their form 7 evaluations.

Because ROLE panels play an important role in researchers' professional development, it is important that reviewers be selected with an eye toward equitable access to this opportunity. Some researchers appear at several ROLE panel reviews, which creates potential problems of equity.

**A.4 Questions concerning the resulting portfolio of awards under review.** Provide comments in the space below the question. Discuss areas of concern in the space below the table.

<p><b>RESULTING PORTFOLIO OF AWARDS</b></p>	<p><b>APPROPRIATE, NOT APPROPRIATE, OR DATA NOT AVAILABLE</b></p>
<p>Overall quality of the research and/or education projects supported by the program.</p> <p>Comments: The quality is high and the projects are diverse.</p>	<p><b>appropriate</b></p>
<p>Are awards appropriate in size and duration for the scope of the projects?</p> <p>Comments:</p>	<p><b>Yes, but see below</b></p>

<p>Does the program portfolio have an appropriate balance of</p> <p style="text-align: center;">■ High Risk Proposals</p> <p>17%</p> <p>Comments: The COV's limited time and sample made it infeasible to estimate accurately the proportions of high risk, multidisciplinary, and innovative proposals, let alone assess their appropriateness. Thus the COV relied largely on the NSF-commissioned contractor analysis of the entire portfolio. Since the determination was based on PI-authored project abstracts, the percentage given is likely to be a lower bound.</p>	<p><b>yes</b></p>
<p style="text-align: center;">■ Multidisciplinary Proposals</p> <p>26%</p> <p>Comments: See above.</p>	<p><b>yes</b></p>
<p style="text-align: center;">■ Innovative Proposals</p> <p>2%</p> <p>Comments: See above.</p>	<p><b>yes</b></p>
<p>Of those awards reviewed by the committee, what percentage of projects address the integration of research and education?</p> <p>Comments:</p>	<p><b>all</b></p>

Discuss any concerns identified that are relevant to the quality of the projects or the balance of the portfolio in the space below.

The COV feels that ROLE should give consideration to longitudinal studies, which require stable funding longer than the typical 3-year grant, or a provision to revisit data and conclusions of previously funded projects for follow-on longitudinal study. NSF may need to explore new mechanisms for funding longitudinal studies.

ROLE's portfolio contains few projects that investigate issues of teaching and learning at the post-secondary level. The COV recommends that ROLE staff make a special effort to bring information about ROLE and the criteria for successful proposals to the community of



post-secondary and discipline-based education researchers.

## **PART B. RESULTS : OUTPUTS AND OUTCOMES OF NSF INVESTMENTS**

NSF investments produce results that appear over time. The answers to questions for this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The attached questions are developed using the NSF outcome goals in the 2002 Performance Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to reach a consensus regarding the degree to which past investments in research and education have measured up to the annual strategic outcome goals.

The COV's should address each relevant question. Questions may not apply equally to all programs. COVs may conclude that the program under review appropriately has little or no effect on progress toward a strategic outcome, and should note that conclusion in the COV's report.

The following report template provides the broad FY 2002 Strategic Outcomes for People, Ideas and Tools, the FY 2002 performance goals for each outcome, and the specific indicators used to measure performance in meeting the annual performance goal. If the COV members are not sure how to interpret the goal or indicators for the particular program, they should request clarification from the NSF program staff.

To justify significant achievement of the outcome goals and indicators, COV reports should provide brief narratives, which cite NSF-supported examples of results. For each NSF example cited, the following information should be provided in the report:

NSF Award Number

PI Names

PI Institutions

Relevant Performance Indicator

Relevant Area of Emphasis

Source for Report

**NOTE:** The ROLE Program has not completed a three-year cycle, making performance indicators difficult to quantify. It would be unfair to judge a three-year

project prior to its completion. Consequently, COV observations are based on final reports of programs that preceded ROLE and, to some extent, annual reports of ongoing ROLE projects, but this report does not attempt to assess performance indicators.

**B.1.a COV Questions for PEOPLE Goal**

**NSF OUTCOME GOAL for PEOPLE: Developing "a diverse, internationally competitive and globally engaged workforce of scientists, engineers, and well-prepared citizens."**

Consider each of the seven indicators for the PEOPLE goal. Has the activity supported projects that demonstrate significant achievement for the PEOPLE outcome goal indicators? To justify your answer, provide NSF-supported examples for each of the relevant indicators that apply to the activity and explain why they are relevant or important for this outcome in the space following the table. If projects do not demonstrate significant achievement, comment on steps that the program should take to improve. Please do not discuss if the indicator is not relevant to the activity.

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<p style="text-align: center;"><b>PEOPLE GOAL INDICATORS</b></p>	<p style="text-align: center;"><b>PROGRAM PROGRESS</b></p> <p style="text-align: center;"><b>SIGNIFICANT, OR</b></p> <p style="text-align: center;"><b>NOT SIGNIFICANT , OR</b></p> <p style="text-align: center;"><b>DOES NOT APPLY, OR</b></p> <p style="text-align: center;"><b>DATA NOT AVAILABLE</b></p> <p style="text-align: center;"><b>(select one)</b></p>
<p>Development of well-prepared scientists, engineers or educators whose participation in NSF activities provides them with the capability to explore frontiers and challenges of the future;</p> <p>Comments: Most reviewed proposals involve graduate students; many involve postdocs and/or undergraduate students.</p> <p>e.g. 9873583, 9903419</p>	<p style="text-align: center;"><b>Significant</b></p>

Improved science and mathematics performance for U.S. K-12 students involved in NSF activities;

Comments: Mostly too early to tell, but some projects have results. In the project cited here preliminary results showed that students with haptic feedback had better attitudes towards the investigations and were more likely to develop 3-dimensional concepts of adenoviruses that were more morphologically accurate. The data show that students entered instruction with inaccurate conceptions of viruses. They knew little about microscopy and nanoscale, and held stereotypes about scientists and science careers. As a result of the instruction, students increased their conceptual understandings of viruses, microscopy, and nanoscale, as well as developed less stereotypical views of scientists and science.

e.g. 0087389

**Significant**

Professional development of the STEM instructional workforce involved in NSF activities;

Comments: Studies examined the methods by which new science teachers, former student teachers, presented the nature of science and issues of equity and inclusion to their own students; the methods by which these beginning teachers engaged all students in talking and thinking about the nature of science; the degree to which the

materials and strategies used resonated or conflicted with those taught in their preservice science education courses; the factors promoting or constraining the number and types of opportunities these teachers provided students; and the implementation of innovative content instruction.

e.g. 0087560

**Significant**

<p>Contributions to development of a diverse workforce through participation of underrepresented groups (women, underrepresented minorities, persons with disabilities) in NSF activities;</p> <p>Comments: One project (0106709) explored the knowledge of algebra teaching (mathematical knowledge, benefits, disposition, and conception of mathematics) used by secondary teachers of algebra to support their instruction.</p> <p>e.g. 0106965, 0106709</p>	<p style="text-align: center;"><b>Significant</b></p>
<p>Enhancement of undergraduate curricular, laboratory, or instructional infrastructure;</p> <p>Comments: In terms of scores on paper and pencil test, students in two scaffolding groups(scaffolding-nonhidden-skills-only vs. scaffolding-hidden-and-nonhidden-skills) performed approximately the same(087632). This was not, however, due to a ceiling effect. It is conceivable that this is because the manipulation (because of issues raised in activities document regarding the practicalities of building different kinds of scaffolding) was not extreme as originally planned. It is also possible that the scaffolding that was present for both groups—in the preliminary instruction materials—helped bring both groups to a reasonable level of performance. It was noted that both groups significantly improved from pre- to post-test.</p> <p>Another project (0106965) developed an auto tutor for computer literacy and physics.</p> <p>e.g. 087632,0106965</p>	<p style="text-align: center;"><b>Significant</b></p>
<p>Awardee communication with the public (publications, presentations, etc.) in order to provide information about the process and benefits of NSF supported science and engineering activities.</p> <p>Comments: COV noticed that information about presentations appeared in different parts of annual reports (or not at all), and recommends clarifying the instructions for where to put it.</p> <p>e.g. 9873583</p>	<p style="text-align: center;"><b>Significant</b></p>

Provide one or more examples of NSF supported results with award numbers to justify each selection above. For each example, provide a brief narrative, to explain the importance of the result in non-technical terms. For each NSF example cited, include the following information:

NSF Award Number: 9873583

PI Names: James Spillane

PI Institutions: Northwestern University

Relevant Performance Indicator: The practice of school leadership and the improvement of mathematics and science instruction in urban elementary schools

Source for Report: Annual Report, 2000

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NSF Award Number: 9903419

PI Names: Jere Confrey

PI Institutions: University of Texas, Austin

Relevant Performance Indicator: Promoting understanding of trigonometry for technologically-reliant trajectories

Source for Report: Annual Report, 2000

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NSF Award Number: 0087389

PI Names: Melissa Jones

PI Institutions: University of North Carolina, Chapel Hill

Relevant Performance Indicator: Investigating viruses with touch: Nanotechnology and science inquiry

Source for Report: Annual Report, 2001

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NSF Award Number: 0087560

PI Names: Julie Bianchini

PI Institutions: University of California, Santa Barbara

Relevant Performance Indicator: Beginning science teachers in action: investigating mis/connections between preservice content and classroom instruction

Source for Report: Annual Report, 2001

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NSF Award Number: 0106709

PI Names: Joan Ferrini-Mundy

PI Institutions: Michigan State University

Relevant Performance Indicator: Knowledge of algebra for teaching

Source for Report: Project Summary, 2001

NSF Award Number: 0087632

PI Names: Marsha Lovett

PI Institutions: Carnegie Mellon University

Relevant Performance Indicator: Dynamic scaffolding to improve learning and transfer of hidden skills

Source for Report: Annual Report, 2001

NSF Award Number: 0106965

PI Names: Arthur C. Graesser

PI Institutions: University of Memphis

Relevant Performance Indicator: Developing auto tutor for computer literacy and physics

Source for Report: Project Summary, 2001

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Comment on steps that the program should take to improve performance in areas of the PEOPLE goal.

The COV recommends better coordination between NSF-sponsored K-12 curriculum developers and ROLE researchers.

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### **B.2.a COV Questions for IDEAS Goal**

**NSF OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Consider each of the six indicators for the IDEAS goal in the table below. Has the activity supported projects that demonstrate significant progress towards the IDEAS outcome goal indicators? Complete the table below for each program reviewed. To support your results in the table, provide NSF-supported examples for each of the relevant indicators that apply to the activity and explain why they are important for the IDEAS outcome. If projects do not demonstrate significant

achievement, comment on steps that the program should take to improve. Do not discuss if indicator is not relevant to the activity.

The ROLE program is too new to expect major discoveries this early. Instead, the COV examined progress instead of achievements, and findings instead of discoveries.

<p style="text-align: center;"><b>IDEAS INDICATORS</b></p>	<p style="text-align: center;"><b>PROGRAM PROGRESS</b></p> <p style="text-align: center;"><b>Select one:</b></p> <p style="text-align: center;"><b>SIGNIFICANT,</b></p> <p style="text-align: center;"><b>NOT SIGNIFICANT,</b></p> <p style="text-align: center;"><b>DOES NOT APPLY or</b></p> <p style="text-align: center;"><b>DATA NOT AVAILABLE</b></p>
<p>Findings that expand the frontiers of learning, science, engineering or technology;</p> <p>Comments: One project provided information relevant to understanding spatial intelligence, a topic critically important to STEM education and to the development of a technologically sophisticated workforce for the 21st century. The interdisciplinary research of eight investigators has begun to provide valuable information. It was learned that the biological substrate for many important forms of spatial processing, in parietal cortex, has an extended developmental course, and thus may be expected to show considerable plasticity and responsiveness to environmental input. Much more was also learned about the nature of spatial processing and symbolic representation of spatial material, and progress was made in computational representations of human processes. The examination of training of spatial processing and the assessment of spatial skills in spatial input to school-aged children were refined.</p> <p>e.g. 0087516</p>	<p style="text-align: center;"><b>Significant</b></p>
<p>Findings that contribute to the fundamental knowledge base;</p> <p>Comments: In terms of scores on paper and pencil test, students in two scaffolding groups(scaffolding-nonhidden-skills-only vs. scaffolding-hidden-and-nonhidden-skills) performed</p>	<p style="text-align: center;"><b>Significant</b></p>

<p>approximately the same. This was not, however, due to a ceiling effect. It is conceivable that this is because the manipulation (because of issues raised in activities document regarding the practicalities of building different kinds of scaffolding) was not extreme as originally planned. It is also possible that the scaffolding that was present for both groups—in the preliminary instruction materials—helped bring both groups to a reasonable level of performance. It was noted that both groups significantly improved from pre- to post-test.</p> <p>e.g. 0087632</p>	
<p>Connections between findings and their use in service to society;</p> <p>Comments: One project examined : (a) <u>Beliefs and actions</u> in terms of how parents in poor urban settings perceive ‘best practice’ in science education in schools initiating science reforms, as well as what they see as their roles in helping to enact such a process, (b) <u>sustaining relationships</u> in terms of how parents in poor urban settings negotiate common understandings about beliefs and practices and build sustaining relationships with each other and with actors within the school (teachers, administrators, and their children), and (c) <u>science education reform</u> in terms of the ways documenting and analyzing the formation, nature, and qualities of sustaining relationships between parents and actors within schools – and the kinds of beliefs and actions those relationships support – shed light on what it means to enact school reform in science education for children in poor urban centers.</p> <p>e.g. 9980592</p>	<p>Significant</p>
<p>Connections between findings and learning or innovation;</p> <p>Comments: One project developed an auto tutor for computer literacy and physics.</p> <p>e.g. 0106965</p>	<p>Significant</p>

ROLE might want to give some priority to research that models education as a complex dynamic system. See for example Kaput, J., Bar-Yam, Y., Jacobson, M., Jakobsson, E., Lemke, J., Wilensky, U., and collaborators. 2001. Two roles for complex systems in education: Mainstream content and means for understanding the education system itself. Report on NSF Project #REC-9980241

Provide one or more examples of NSF supported results with grant numbers to justify each selection above. For each example, provide a brief narrative to explain the importance of the result



in non-technical terms. For each NSF example cited, include the following information:

NSF Award Number: 0087516

PI Names: Janelle Huttenlocher

PI Institutions: University of Chicago

Relevant Performance Indicator: Understanding and teaching spatial competence

Source for Report: Annual Report, 2001

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NSF Award Number: 0087632

PI Names: Marsha Lovett

PI Institutions: Carnegie Mellon University

Relevant Performance Indicator: Dynamic scaffolding to improve learning and transfer of hidden skills

Source for Report: Annual Report, 2001

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NSF Award Number: 9980592

PI Names: Angela Barton

PI Institutions: University of Texas, Austin

Relevant Performance Indicator: Parents in poverty and science education reform: A relational systems approach

Source for Report: Annual Report, 2000

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NSF Award Number: 0106965

PI Names: Arthur C. Graesser

PI Institutions: University of Memphis

Relevant Performance Indicator: Developing auto tutor for computer literacy and physics

Source for Report: Project Summary, 2001

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**B.3.a COV Questions for TOOLS Goal**

**OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art and shared research and education tools."**

Consider each of the six indicators for the TOOLS goal. Has the activity supported projects that demonstrate significant achievement for the TOOLS outcome goal indicators? Provide NSF-supported examples for each of the relevant indicators that apply to the activity and explain why they are important for the TOOLS outcome. If projects do not demonstrate significant achievement, comment on steps that the program should take to improve. Do not discuss if indicator is not relevant to the activity.

There's a real need for a system to provide access and analysis tools for the ROLE body of results.

NSF emphasizes the broader impacts of research results and products. The long-term dissemination of products such as instructional materials and research instruments is not clear in many proposals. It might be due to the focus of ROLE in producing prototype materials rather than wider use of these materials once they are ready for it. NSF may consider a mechanism for developing prototypes into tools suitable for wider distribution.

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<p style="text-align: center;"><b>TOOLS INDICATORS</b></p>	<p style="text-align: center;"><b>PROGRAM PROGRESS</b></p> <p style="text-align: center;">Select one:</p> <p style="text-align: center;"><b>SIGNIFICANT,</b></p> <p style="text-align: center;"><b>NOT SIGNIFICANT,</b></p> <p style="text-align: center;"><b>DOES NOT APPLY or</b></p> <p style="text-align: center;"><b>DATA NOT AVAILABLE</b></p>
<p>Provision of facilities, databases or other infrastructure that enable discoveries or enhance productivity by NSF research or education communities;</p> <p>Comments: Materials and educational software.</p> <p>e.g. 9972999, 0087583</p>	<p style="text-align: center;"><b>Significant</b></p>
<p>Use of the Internet to make STEM information available to the NSF research or education communities;</p> <p>Comments: During the first year of the project, the SCALE web site primarily served to support the ongoing research efforts of SCALE collaborators. The site supports mailing lists and file storage for collaboration grants, as well as coordinating review of common documents. Links to resources relevant to the SCALE community are available,</p>	<p style="text-align: center;"><b>Significant</b></p>

including participating research projects, available technology, and shared assessment devices. In the second year of the project, the site will expand to take on more of a public face, offering the results and syntheses of SCALE research to researchers and educators.

e.g. 0087832

Development of information and policy analyses that contribute to the effective use of education, science and engineering resources.

Comments: Assessments for statewide assessment system.

e.g. 9972999

**Significant**

Provide one or more examples of NSF supported results with award numbers to justify each selection above. For each example, provide a brief narrative to explain the importance of the result in non-technical terms. For each NSF example cited, include the following information:

NSF Award Number: 9972999

PI Names: Earl B. Hunt

PI Institutions: University of Washington

Relevant Performance Indicator: To develop WEB based tools for improving science and mathematics instruction in the state of Washington

Source for Report: 1999-2000 annual report

NSF Award Number: 0087583

PI Names: Barbara White

PI Institutions: University of California at Berkeley

Relevant Performance Indicator: Modeling, developing, and assessing scientific inquiry skills using a computer-based inquiry support environment

Source for Report: 2000-2001 annual report

NSF Award Number: 0087832

PI Names: Marcia Linn

PI Institutions: University of California, Berkeley

Relevant Performance Indicator: Synergy Communities: Aggregating learning about education (SCALE)

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Comment on steps that the program should take to improve performance in areas of the TOOLS goal.

**B.3.b COV Questions related to TOOLS Areas of Emphasis**

For each relevant area shown below, determine whether the program's investments and available results demonstrate the likelihood of strong performance in the future? Justify your argument by providing NSF-supported examples of investment results (with grant numbers) that relate to or demonstrate outcomes for the TOOLS goal and relevant indicators in the space below the area of emphasis. If the area of emphasis is not relevant to the activity, do not discuss.

<p style="text-align: center;"><b>TOOLS Areas of INVESTMENTS</b></p>	<p style="text-align: center;"><b>Demonstrates likelihood of strong performance in future?</b></p> <p style="text-align: center;"><b>Select one:</b></p> <p style="text-align: center;"><b>Yes, No, Does Not Apply or Data Not Available</b></p>
<p>Education and or science &amp; engineering information, reports, and databases</p> <p>Comments:</p>	<p style="text-align: center;"><b>Does Not Apply</b></p>
<p>Education and/or scientific databases and tools for using them</p> <p>Comments:</p>	<p style="text-align: center;"><b>Does Not Apply</b></p>

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Provide one or more examples of NSF supported results with award numbers to justify each selection above. For each example, provide a brief narrative to explain the importance of the result in non-technical terms. For each NSF example cited, include the following information:

NSF Award Number

PI Names

PI Institutions

Relevant Performance Indicator

Relevant Area of Emphasis

Source for Report

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**B.4 Please comment on any program areas in need of improvement.**

The COV is impressed with ROLE and its management. It is too soon to be able to evaluate discoveries or the degree to which there will be communication and cooperation between education and science groups as a result of this program. It is anticipated, for example, that the G-K Fellowship program will have an impact. ROLE staff is urged to promote linkages that will integrate the roles of educational research, science and society.

Also, the COV believes that consideration be given to longer-term longitudinal studies.

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**B.5 Provide comments as appropriate on the program's performance in meeting program-specific goals and objectives, which are not covered by the above questions.**

The COV was very impressed with the portfolio management style and the breadth and knowledge about proposals exhibited by program officers in interactions with panel members and proposers, both accepted and declined.

The COV underscores the importance of the review process as a form of professional development for reviewers. Therefore the program needs to ensure equitable access to this opportunity when it selects panels of reviewers. Reliance on the same people repeatedly does not support the goal of equitable peer review.

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**B.6 NSF would appreciate your comments for improvement of the COV review process, format and report template.**

ROLE should consider a definition of "broader impact" that is unique for its program and different, perhaps, from the NSF overall definition.

The COV recommends electronic access to jackets, annual reports, and other supporting information.

The read-ahead notebook contained too much extraneous information, such as general descriptions of NSF, yet too little specific to the COV task. It should contain project summaries of the ROLE portfolio.

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