

Archived Information

GUIDELINES FOR SUBMITTING SCIENCE PROGRAMS FOR DESIGNATION AS PROMISING AND EXEMPLARY

Background and Purpose of the Expert Panel

The Educational Research, Development, Dissemination and Improvement Act of 1994 directed the Assistant Secretary of Educational Research and Improvement to establish "panels of appropriate qualified experts and practitioners" to evaluate educational programs and recommend to the Secretary those programs that should be designated as promising or exemplary. The Expert Panel on Mathematics and Science Education (the "Expert Panel") is one of those panels. ***The Expert Panel reviewed mathematics programs in the Winter of 1998 and will review science programs in the Winter of 1999. The Panel plans to review both mathematics and science programs in the Winter of 2000.***

It is the purpose of the Expert Panel to oversee a valid and viable process for identifying and designating promising and exemplary programs in mathematics and science education so that practitioners can make better-informed decisions in their ongoing efforts to improve the quality of student learning in mathematics and science. Specific responsibilities of the Expert Panel include overseeing the entire review process; revising and fine-tuning the review process, as necessary; identifying, selecting, and training reviewers and review panels; making recommendations to the Secretary of Education for designating programs as promising and exemplary; and assuring that the broad and effective dissemination of information about designated promising and exemplary programs occurs.

Overview of the Review Process

Programs submitted to the Expert Panel will be reviewed first by two trained Quality Review Panel (QRP) teams, each comprised of two reviewers. QRP reviewers will be drawn from a trained pool of qualified practitioners and researchers with content expertise and classroom teaching experience. QRPs will evaluate programs based on criteria that fall under three categories: (1) *Quality of Program*; (2) *Usefulness to Others*; and (3) *Educational Significance*. Programs that satisfy the criteria under these categories will be reviewed by an Impact Review Panel (IRP), which evaluates programs against a fourth category of criteria: *Evidence of Effectiveness and Success*. The IRP is comprised of national experts in evaluation design and analysis.

The Expert Panel will review the evaluation scores of the QRP and the IRP and determine which programs to recommend to the Secretary of Education as promising or exemplary. The Secretary will announce designated programs.

Recognition and Dissemination of Exemplary/Promising Programs

Programs designated as promising or exemplary by the Expert Panel will be fed into a larger system, the National Education Dissemination System, established by law to "create, validate, and disseminate to educators, parents and policy makers those educational programs that have potential or have been shown to improve educational opportunities for students." Other national, regional, and state school improvement systems, such as the Eisenhower Regional Mathematics and Science Education Consortia and other systemic initiatives, also will be used. Programs can benefit from this recognition through publicity and professional networking opportunities, including commendation by the Secretary of Education, potential invitations to present at professional conferences and to other educational audiences, and recognition in professional journals. Various funding opportunities also may arise from a program's designation as exemplary or promising.

What is a "Program" and Who is Eligible to Apply?

For the purposes of the Expert Panel's review process during the Winter 1999 Science Review, a program is defined as: a coordinated set of instructional activities and/or materials designed to enhance student science learning in school-based PreK-12 programs. Programs should have the following characteristics:

- ▶ *explicit learning goals;*
- ▶ *connected components that address these goals;*
- ▶ *sufficient scope, duration, and importance to make a significant difference in student learning; and*
- ▶ *evidence of positive impact on student learning.*

Schools, districts and other non-profit and commercial organizations are invited to submit programs to the Expert Panel. Submissions may come from a range of national, state or local developers. Comprehensive educational programs of one year or more of instructional duration and supplemental programs of at least 60 hours or a semester or an equivalent of half an academic year of instructional duration with evidence of success may apply.

Programs will be reviewed based on the submitter's classification of the program as either comprehensive or supplemental (refer to Attachment A).

How to Complete a Program Submission

Detailed instructions for completing a program submission are provided on the following pages. Please send **five** copies of the submission and relevant instructional materials or activities to the address listed on page 6. If a program is designated as promising or exemplary, instructional materials will remain the property of the U.S. Department of Education to be used for later dissemination. If a program does not receive a designation, instructional materials will be returned to the submitter with feedback. Additional assistance regarding program submission can be obtained by contacting RMC Research (see address on page 6).

If a program is marketed as a multiple year series then the entire series is to be submitted for review. If a program is marketed as separate, though perhaps related, modules or programs then each module or program should be submitted separately. See sampling instructions in the next section.

What Instructional Materials Should be Submitted?

- ▶ **Comprehensive Programs.** Science programs of one year or more of instructional duration (including integrated, thematic programs) need to submit sample program materials pertinent to the following three content areas: physical, earth, and life sciences. If the program covers other science content areas, the submitter should describe the complete program and materials in the written submission and submit a sample of other important instructional materials that are representative of these areas.

Sampling of materials may be based on *grade level* (e.g., select a set of complete materials for only two or three grade levels

from a K-6 program); or *topics, themes or units* (e.g., select materials for only one complete unit from each of the other content areas covered by the program); or *activities, kits, or equipment* (e.g., limit the selection of this type of material to only one or two items in order to provide reviewers with insight into how students experience the program).

If a science program is kit-based, the submitter needs to submit one complete unit. Multi-grade programs (e.g., K-8) should self-select a sample of grades (e.g., grades 1, 4, and 7) for which to send unit materials.

- ▶ **Supplemental Programs.** Science programs of at least 60 hours or a semester or an equivalent of half an academic year of instructional duration need to submit program materials representative of the content areas covered. The sampling guidelines described above for comprehensive programs apply to supplemental programs, also.

Limitations on the Volume of Materials to be Submitted

Five sets of any materials to be reviewed should be sent. However, each set should comprise no more than one box approximately 12" x 12" x 18" in size. Requests for exceptions to this limit should be made by telephone or e-mail to RMC Research.

DO NOT send equipment, supplies, live plants or animals, or hazardous materials.

Deadline for Submission

To be reviewed in Winter 1999, science programs must be **received** by: **Monday, March 1, 1999**. The next review cycle for both mathematics and science programs will occur in Winter, 2000.

Please mail science submissions to:

Expert Panel on Mathematics and Science Education
Program Submission

c/o RMC Research Corporation
1000 Market Street, Building 2
Portsmouth, New Hampshire 03801
Phone: (800) 258-0802
Fax: (603) 436-9166
E-mail: rmc@rmcres.com
<http://www.rmcres.com>

INSTRUCTIONS FOR COMPLETING A PROGRAM SUBMISSION

Please include the following information in your submission:

- I. Submission Cover Sheet.** Please complete Attachment A.

- II. Table of Contents and List of Materials.** Provide a table of contents for your submission materials and a list of all instructional materials included in your submission (e.g., titles of textbooks or workbooks). It is important to include overview materials (e.g., teacher's manual or activity summaries) and specific materials related to your stated learning goals (refer to Attachment B).

- III. Program Abstract.** Summarize briefly (250 words or less) basic information about your program, program goals, and the population served by the program.

- IV. Description and Background.** State briefly (maximum of 4 single-spaced pages):
 - i. Description of the Program** — its purposes, goals, philosophy and history, scope and duration, major components, funding and staffing requirements, and important, innovative or unique strengths.

 - ii. Training Resources** — describe the training and staff/professional development materials and activities offered by the program; on- and off-site training opportunities; scheduled local, regional and/or national training workshops, institutes or conferences; and other unique components of your training program.

iii. Program Costs — indicate the total cost for the implementation of the program and provide a breakdown of costs (e.g., training, personnel, materials and supplies, etc.).

iv. Site Information and Demographics — describe where and how the program has been used and by what types of users. Include ethnic, racial, and gender percentages. If possible, include the size of any special populations served (e.g., ESL, students with disabilities).

V. List of Program Learning Goals. Please complete Attachment B. Note relevant pages in supporting materials, when appropriate.

VI. Claims of Program Effectiveness. Please complete Attachment C. List your program claims, evaluation methods, and evidence of success or effectiveness.

VII. Meeting the Evaluation Criteria. Please describe how your program meets the evaluation criteria presented in the next section. You must address **each** criterion to explain and justify the merit of your program. Use the indicators as guidelines in formulating a 1-2 page response for each criterion. Responses to the criteria should acknowledge the program's weaknesses, as well as strengths, and specify how you plan to address any perceived weaknesses. Please note relevant pages in supporting materials, when appropriate. Responses to **Criteria 1 - 7** and the response to **Criterion 8** will be reviewed by separate review panels. As such, please separate your responses to Criteria 1-7 from your response to Criterion 8.

Responses to Criteria 1-7.

Please do not exceed 15 pages to address Criteria 1-7.

Response to Criterion 8.

You may include as much material as necessary to address Criterion 8, especially internal and external evaluation reports, statistical results (including charts and graphs), and examples of surveys and other data collection instruments. You should not exclude evaluation data indicating mixed or negative results. ***Please do not send raw data such as completed answer sheets or survey forms.***

The major achievements of the program should be clearly stated and supported by convincing evidence of effectiveness. In your response to Criterion 8, you need to provide a description of your evaluation methodology including detailed information about the following elements:

- ▶ Evaluation Design (e.g., quantitative model such as pre-post test, qualitative model such as a case study, etc.)
- ▶ Sample (e.g., number of participants, sample selection)
- ▶ Instruments and Procedures (e.g., assessment measures, validity and reliability)
- ▶ Data Collection Procedures (e.g., how data were collected and by whom)
- ▶ Data Analysis (e.g., statistical methods, significance level, scoring rubrics; if available, please provide data disaggregated by as many of the following categories as possible: race, ethnicity, gender and disability status)
- ▶ Interpretation and Discussion of Results

Attachment C (The Claims of Program Effectiveness Chart) should reflect a summary of your response to Criterion 8.

VIII. Review Procedures

Program submissions are judged against eight criteria, each with a number of indicators. The criteria are grouped into four categories: (A) *Quality of Program*, (B) *Usefulness to Others*, (C) *Educational Significance*, and (D) *Evidence of Effectiveness and Success*.

Step I: Identify and Cite Evidence: For each criterion, reviewers identify evidence from the submitted materials that illustrates how the program addresses each of the indicators. Sources are identified for each specific citing.

Step II: Criteria 1-7 Ratings: For **Criteria 1-7, QRP** reviewers use the 5-point Rating Scale below to make a summary rating of the degree to which each criterion is met. All criteria ratings are based on the quality of the evidence identified in Step I.

RATING SCALE FOR CRITERIA 1 - 7

The following scale is used to indicate the degree to which each criterion is met.

The criterion is met: 5.....exceptionally
4.....strongly
3.....adequately
2.....inadequately
1.....not at all

Step III: Criterion 8 Rating: For **Criterion 8, IRP** reviewers decide on whether to recommend the program as either promising or exemplary.

Step IV: Justification of Criterion Rating: Reviewers provide a justification for each criterion rating based on the quality of the evidence identified in Step I and identify which indicators they may have weighted more heavily than others.

EVALUATION CRITERIA

Your program will be evaluated against the following eight criteria. Each criterion is followed by a number of indicators: ***your submission must address each criterion.*** Use the indicators as guidelines. If a certain indicator does not apply, please note.

A. Quality of Program

Criterion 1. The program's learning goals are challenging, clear, and appropriate for the intended student population.

Indicator a. The program's learning goals are explicit and clearly stated.

Indicator b. The program's learning goals are consistent with research on teaching and learning or with identified successful practices.

Indicator c. The program's learning goals foster the development of skills, knowledge, and understandings.

Indicator d. The program's learning goals include important concepts within the subject area.

Indicator e. The program's learning goals are achievable with appropriate hard work and persistence.

Criterion 2. The program's content is aligned with its learning goals, and is accurate and appropriate for the intended student population.

Indicator a. The program's content is aligned with its learning goals.

Indicator b. The program's content emphasizes a few topics in great depth.

- Indicator c. The program's content reflects important scientific ideas and the processes and nature of scientific inquiry.
- Indicator d. The program's content makes connections within a particular science, across the sciences, and to other disciplines.
- Indicator e. The program's content is culturally and ethnically sensitive, free of bias, and reflects diverse participation and diverse student interests.

Criterion 3. The program's instructional design is appropriate, engaging, and motivating for the intended student population.

- Indicator a. The program's instructional design provides students with a rationale for learning this material.
- Indicator b. The program's instructional design attends to students' prior knowledge and commonly held conceptions.
- Indicator c. The program's instructional design fosters the use and application of skills, knowledge, and understandings.
- Indicator d. The program's instructional design is engaging and promotes learning.
- Indicator e. The program's instructional design promotes student discussions, appropriate collaborative work, and reflection on experiences.
- Indicator f. The program's instructional design promotes multiple and effective approaches to learning.

Criterion 4. The program's system of assessment is appropriate and designed to provide accurate information about student learning and to guide teachers' instructional decisions.

- Indicator a. The program's system of assessment is an integral part of instruction.
- Indicator b. The program's system of assessment is consistent with the content, goals, and instructional design of the program.

- Indicator c. The program's system of assessment encourages multiple approaches and methods.
- Indicator d. The program's system of assessment probes students' abilities to demonstrate depth of understanding and to apply their learning.
- Indicator e. The program's system of assessment helps teachers select or modify activities to meet learning needs.

B. Usefulness to Others

Criterion 5. The program can be successfully implemented, adopted, or adapted in multiple educational settings.

- Indicator a. The program provides clear instructions and sufficient training materials to ensure use by those not in the original program.
- Indicator b. The program is likely to be successfully transferred to other settings.
- Indicator c. The program specifies the conditions and resources needed for implementation.
- Indicator d. The program's costs (time and money) can be justified by the benefits.

C. Educational Significance

Criterion 6. The program's learning goals reflect the vision promoted in national standards in science education.

- Indicator a. The program's learning goals and subject matter content are aligned with national standards.

Indicator b. The program's pedagogy and assessment are aligned with national standards.

Indicator c. The program promotes equity and equal access to knowledge as reflected in national standards.

Criterion 7. The program addresses important individual and societal needs.

Indicator a. The program is of sufficient scope and importance to make a positive difference in student learning.

Indicator b. The program contributes to increases in teachers' knowledge of effective teaching and learning.

Indicator c. The program:

- ▶ is designed to improve learning for a wide spectrum of students OR
- ▶ serves to meet the special learning needs of under-served students OR
- ▶ serves to meet the special learning needs of high-performing students whose interests and talents go beyond core science education.

D. Evidence of Effectiveness and Success

Criterion 8. The program makes a measurable difference in student learning.

Promising Programs, in addition to satisfying criteria 1-7, must provide **preliminary** evidence of effectiveness in **one or more sites** for **at least one** of the indicators below:

Indicator a. The program has evidence of gains in student understanding of science.

- Indicator b. The program has evidence of gains in inquiry, reasoning, and problem-solving skills.
- Indicator c. The program has evidence of improvements in course enrollments, graduation rates, and post-secondary school attendance.
- Indicator d. The program has evidence of narrowing the gap in achievement or accomplishment between disaggregated groups.
- Indicator e. The program has other evidence of effectiveness or success.

Exemplary Programs, in addition to satisfying Criteria 1-7, must provide **convincing** evidence of effectiveness in **multiple sites with multiple populations** regarding **two or more** of the indicators below. The items must include either both indicators from Part I or one indicator from Part I and one indicator from Part II. Providing evidence of two indicators from Part II is not sufficient.

Part I

- Indicator a. The program has evidence of **significant** gains in student understanding of science.
- Indicator b. The program has evidence of **significant** gains in inquiry, reasoning, and problem-solving skills.

Part II

- Indicator c. The program has evidence of improvements in course enrollments, graduation rates, and post-secondary school attendance.
- Indicator d. The program has evidence of narrowing the gap in achievement or accomplishment between disaggregated groups.
- Indicator e. The program has other evidence of effectiveness or success.

ATTACHMENT A: SUBMISSION COVER SHEET

A. Program Information

1. Title of Program

2. Source/s and Level/s of Development Funding by Year (e.g., 1990 — \$100,000 grant from NSF; 1993 — \$60,000 grant from the XYZ Foundation)

3. Indicate the **one** category that best describes the program (*please note, programs may be submitted in only one of the categories*):

- comprehensive: educational programs of one year or more of instructional duration
- supplemental: educational programs of at least 60 hours or a semester or an equivalent of half an academic year of instructional duration

4. Indicate the specific science content area/s covered by this program (*please check all that apply*):

- physical sciences
- earth sciences
- life sciences
- other science content areas (*please specify*) _____

5. Describe the specific topics in science covered by this program:

6. Describe the population and grade levels this program has served:

- grades PreK-2 (primary) grades 6-8 (middle school)
 grades 3-5 (intermediate) grades 9-12 (high school)

7. Describe the computer and other technological capabilities necessary to fully review this program:

B. Contact Information

Name of Applicant: _____

Organization/Affiliation: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

WWW Home Page: _____

Applicant's involvement with program (please check one):

Author/Developer Publisher Evaluator User

Program Developer (if not the applicant):

Program Publisher (if not the applicant):

If this program is copyrighted, who holds the copyright?

C. Certification of Accuracy and Completeness

Please certify that the information provided in this submission is true, accurate, and complete. Submissions should acknowledge strengths and weaknesses of the program. Also, if more than one evaluation has been conducted, evidence from all evaluations should be provided, not just those with the best results.

I certify that the information provided in this submission is true, accurate, and complete.

Signature: _____ Date: _____

Program Submitter

ATTACHMENT B: PROGRAM LEARNING GOALS

1. On the next page, identify the program's significant learning goals. (Attach a second page, if required.)
2. Indicate which **ONE** learning goal you wish reviewers to focus on in their review. Reviewers will review a second (and, perhaps, third) learning goal, randomly selected from this list. Submitters should provide their best program materials to support their strongest learning goal/s and ensure that these materials are representative of other parts of the program.

Exception: Comprehensive programs need to identify their grade level category/ies and identify one learning goal for a self-selected grade in *each* of the following categories covered by their program: grades PreK-2 (primary); 3-5 (intermediate), 6-8 (middle school), and 9-12 (high school).

For this process, ***learning goals are defined as statements of student understanding that the program seeks to attain and for which specific evidence is provided.*** The specificity of the learning goals will necessarily vary based on the scope of the program. Submitters are encouraged to refer to state and national standards documents (such as the National Science Education Standards (NSES) and Project 2061 Benchmarks for Science Literacy) for guidance in identifying their learning goals.

Examples of learning goals that are ***appropriate*** for this submission include:

- ▶ students will demonstrate the ability to apply probability and statistics for representing and interpreting data, and communicate results using technologies, when needed
- ▶ any actual NSES standard or Project 2061 benchmark

Examples of learning goals that are ***not appropriate*** for this submission include:

- ▶ instruction that engages students in exploration of science concepts
- ▶ ensuring success for all students
- ▶ providing science that meets the NSES standards

ATTACHMENT C: CLAIMS OF PROGRAM EFFECTIVENESS CHART

The Expert Panel requires that you provide evaluation data demonstrating which of your program goals and objectives related to differences in student learning of science you claim were achieved. (*See the Criterion 8 indicators listed on pages 14-15.*) In the chart on page 24, please list all of your student learning claims and describe the corresponding evaluation methods used and evidence of success or effectiveness. To assist you in completing the chart, please refer to the following explanations.

Program Claims are concise statements of your program's impact on student learning. A claim statement should make reference to the target student population and the nature and direction of the change in student learning of science.

Examples of **acceptable** claims include the following:

- ☺ Project XYZ students in grades K-6 demonstrated greater gains than a comparison group on the ABC Science Performance Assessment.
- ☺ As a result of participating in Project XYZ, students were more likely to enroll in advanced science courses in high school than previous student groups and when compared to other urban high schools.

Examples of **unacceptable** claims include the following:

- ☹ Students rated the Project XYZ teachers and activities highly on a classroom survey.
- ☹ Students engaged in more exploration of science concepts through participation in the XYZ Science Project.

Evaluation Methods refer to your design, sample, instruments, and data analysis. Keep in mind that the evaluation design should allow reviewers to conclude that the change in student learning is attributable to the program. The following is an **acceptable** entry in the evaluation methods column:

- ☺ Pre-post comparison group design
 - Project XYZ = 98 K-6 students from 3 school sites
 - Comparison group = 87 K-6 students from the same 3 school sites
 - ABC Science Assessment

Evidence of Effectiveness refers to **preliminary** evidence for Promising status or **convincing** evidence for Exemplary status that supports each corresponding claim. To assist the reviewers in judging significance of change, respondents should provide compelling information to support each claim (for example, baseline or comparative data) and report significance levels or effect sizes if available. Submitters also should specify whether results were uniformly positive or mixed across sites.

PROGRAM CLAIMS	EVALUATION METHODS	EVIDENCE OF EFFECTIVENESS