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USER-FRIENDLY HANDBOOK FOR PROJECT EVALUATION: Science, Mathematics, Engineering and Technology Education

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ABOUT THE AUTHORS

This Handbook is the product of several authors. Originally, it began as two separate papers describing various aspects of the evaluation process. Sensing a need for a more complete document, the National Science Foundation asked that the papers be used as the basis for a Handbook specially tailored for projects supported by the Directorate for Education and Human Resource Development (EHR). The Handbook has grown a bit beyond the original papers and the papers have been somewhat reshaped, but the message and advice contained reflect the solid advice of the NSF staff that originated it. Credit for the Handbook goes to:

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Dr. Stevens is currently a Program Director for Evaluation in the Evaluation Section of the Division of Research, Evaluation, and Dissemination (RED). While at NSF she is on an Interagency Personnel Assignment from the Los Angeles Public Schools where she is Director of Research and Evaluation. Dr. Stevens conceived the idea for this Handbook and drafted the original versions of Chapters One, Four, and Six, and the Glossary.

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Additional writing and editing was done by the staff of Booz·Allen & Hamilton Inc. Dr. Joy Frechtling refined the original chapters and provided overall technical editing.

INTRODUCTION: ABOUT THIS HANDBOOK

This Handbook was developed to provide Principal Investigators and Project Evaluators working with the National Science Foundation's Directorate for Education and Human Resource Development (EHR) with a basic understanding of selected approaches to evaluation. It is aimed at people who need to learn more about both what evaluation can do and how to do an evaluation, rather than those who already have a solid base of experience in the field. It builds on firmly established principles, blending technical knowledge and common sense to meet the special needs of NSF's programs and projects and those involved in them.

NSF supports a wide range of programs aimed at improving the status of mathematics, science, technology, and engineering in our schools and increasing the participation of students at every level of the educational system. Each program funds many projects, some of which are broad-based and systemic in nature; others which are more specifically focused on a part or a small number of parts of the educational system. Evaluation is important to each one of these.

NSF and the Principal Investigators themselves need to know what these projects and programs are accomplishing, and what it is about them that makes them work or may stand in the way of success. Although the approaches to evaluation selected may differ depending on the nature of the program or project, its goals, and where it is in its "life cycle," the Foundation firmly believes that each program and project can be improved by soundly conducted evaluation studies. While the information in this Handbook should be useful in evaluating programs as well as projects, it is primarily targeted at project evaluation, which may be conducted by a member of the project staff or by an outside evaluator.

The Handbook discusses quantitative and qualitative evaluation methods, but the emphasis is on quantitative techniques for conducting outcome evaluations, those designed to assess the results of NSF funded innovations and interventions. Although there is much interest in the evaluation community in a less traditional and more qualitative approach to evaluation, at the present time this approach seldom meets NSF requirements, especially for Summative Evaluations. For activities dependent on federal funding, which are

subject to periodic funding decisions by NSF managers as well as the Office of Management and Budget (OMB) and congressional staffs and decision-makers, emphasis is still on quantitatively measurable outcome information: did the treatment or innovation (the program funded by the federal agency) result in outcomes which can be attributed to these federal expenditures and might not have occurred without these expenditures? As stated in a recent report issued by GAO (the Government Accounting Office, which is the agency charged with oversight of government programs for the U.S. Congress):

"Over the next few years, the federal government will face powerful opposing pressures: the need on the one hand to reduce the federal deficit, and the demand, on the other, for a federal response to some potentially expensive domestic problems. . . (The need is for) program effectiveness evaluations which estimate the effects of federal programs using statistical analysis of outcomes (such as educational achievement test scores or conditions of housing) for groups of persons receiving program services compared with similar groups of non participants."

Obviously, decision makers at the highest levels of the executive and legislative branches of government are looking for traditional "effectiveness indicators" although, as we have emphasized in the Handbook, these are often very difficult for evaluators to establish.

To develop this Handbook we have drawn on the skills of both NSF staff familiar with the Foundation's educational programs and outside evaluators who have experienced the challenge of examining projects in a real-world setting. This Handbook is not intended to be a theoretical treatise, but rather a practical guide to evaluating NSF/EHR funded projects.

The Handbook addresses several topics. The first four chapters focus on designing and implementing evaluation studies:

- Chapter One describes the various types of evaluation prototypes
- Chapter Two presents an overview of the evaluation process

- Chapter Three describes the collection and analysis of data
- Chapter Four examines report writing.

The remaining chapters provide support materials:

- Chapter Five contains examples of project evaluations, illustrating the prototypes described earlier, and highlighting strengths and weaknesses of the approaches described.
- Chapter Six provides information on selecting an evaluator.
- Chapter Seven provides a glossary.
- Finally (for those who are challenged or intrigued by what they have read here, or feel the need to learn more), Chapter Eight provides supplemental references in the form of an annotated bibliography.

In addition to evaluation, Project Directors need to plan the dissemination of project outcomes to a broader audience. A separate publication dealing with dissemination guidelines has been prepared by NSF.

REFERENCE

Government Accounting Office (1992). *Program Evaluation Issues.* GAO/OCG-93-6TR.