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ABSTRACT

This report analyzes the contributions that the 10 Eisenhower Regional Mathematics and Science Education Consortia have made to U.S. efforts to reform mathematics and science education. The United States Congress authorized the Regional Consortia Program in 1990 under the Excellence in Mathematics, Science, and Engineering Education Program. In reauthorizing the Regional Consortia Program, Congress reaffirmed the purpose of the Consortia supported by the program as being to disseminate exemplary mathematics and science education instructional materials and assist school staff in the implementation of teaching methods and assessment tools. The data presented in this report were collected largely in the spring of 1996 through surveys, interviews, site visits, and review of a variety of documents. Another more limited round of data collection was completed in spring 1997. This included telephone interviews and document review. Chapters include: (1) "Introduction"; (2) "Evolution of the Regional Consortia Program and the Challenge of Working with Intensive Sites"; (3) "Professional Development"; (4) "Teams and Networks: Consortia Links To the Field"; (5) "Promising Practices"; (6) "The Use of Technology by the Consortia"; (7) "Networking and Coordination"; and (8) "Conclusions". Appendices contain the survey procedures, instruments, and program indicators. (ASK)

Eisenhower Mathematics and Science Education Regional Consortia Program: Final Evaluation Report

1998

U.S. DEPARTMENT OF EDUCATION • OFFICE OF THE UNDER SECRETARY

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EXECUTIVE SUMMARY

This report analyzes the contributions that the 10 Eisenhower Regional Mathematics and Science Education Consortia have made to the nation's efforts to reform mathematics and science education. The U.S. Congress authorized the Regional Consortia Program in 1990 under the Excellence in Mathematics, Science, and Engineering Education Act (P.L. 101-589, Title II). The program was reauthorized under the Improving America's Schools Act of 1994 (P.L. 103-382, Title XIII, Part C). In reauthorizing the Regional Consortia Program, Congress reaffirmed the purpose of the Consortia supported by the program as being: (1) to disseminate "exemplary mathematics and science education instructional materials" and (2) to assist school staff in "the implementation of teaching methods and assessment tools." Both the original statute and the reauthorizing legislation required each Consortium to establish a regional board to "oversee the administration and establishment of program priorities...." The statutes also went on to list a large number of activities that the Consortia could engage in to achieve the two broad purposes specified by Congress. Subsequently, the Department of Education set several priorities that helped define expectations for the work of the Consortia. In the first grant period, the Department's solicitation for proposals set an absolute priority on assistance in systemic reforms in mathematics and science education and assistance to states. In the second grant period, the Department's solicitation included an invitational priority on intensive services to selected local sites.

The data presented in this report were collected largely in the spring of 1996 through: (1) surveys of approximately 1,000 participants and recipients of Consortia activities and services; (2) interviews with Consortia staff, participants in Consortia activities, and others who were familiar with the Consortia's work; (3) site visits; and (4) review of a variety of documents, including Consortia proposals, refunding requests, reports, and products. Another, more limited, round of data collection was completed in spring 1997. This included telephone interviews and document review. In addition to this report and the two rounds of data collection activities, the 4-year national evaluation of the Regional Consortia Program has included a round of data collection completed in 1994 and an interim report, which was completed in 1995.

Evolution of the Consortia Program

The Regional Consortia Program, which is housed in the Department's Office of Educational Research and Improvement (OERI), supports 10 Consortia. Eight of the 10 current Consortia have received support since October 1992. The two Consortia that won grants in the most recent competition (September 1995) are the Eisenhower Regional Alliance for Mathematics and Science Education and the Science and Mathematics Consortium for Northwest Schools. Seven of the current Consortia grants were awarded to organizations that also held contracts for regional educational laboratories. In fiscal year 1993, the first year of support, funding for individual Consortia ranged from just under $1 million to just over $1.55 million. In the second grant period, which began in October 1995 and ends in September 2000, each Consortium was funded at approximately $1.5 million annually.

Like any new assistance organizations, the Consortia faced several challenges during their early years of operation. They had to build their organizational capacity and market themselves as potentially valuable resources and allies in a complex and not always welcoming reform arena. They also had to find ways of collaborating with each other so that the Regional Consortia Program and the Eisenhower National Clearinghouse (ENC) would become greater than the sum of the individual parts.

By the end of the first grant period, the Consortia had generally succeeded in the tasks of building institutional capacity and establishing themselves as players in the mathematics and science education reform arena. They had also learned important lessons about the strategies and benefits of working with each other, with the ENC, and with other entities in their regions. Finally, as the evaluators reported in the First Interim Report on the national evaluation, the Consortia also had to face the basic issue of how to invest relatively modest resources to have the greatest impact on large and complex problems.

Findings about Consortia Activities and Services

This evaluation focused on six categories of Consortia activities and services. The categories include professional development, support for teams and networks, dissemination of a volume on promising practices in mathematics and science education, and intensive work with selected sites. In addition, the evaluators reviewed the Consortia's substantive focus on technology and their use of technology to augment other assistance to the field. Finally, the evaluators examined the collaborative work among

the Consortia, the ENC, and other entities—including mathematics and science reform initiatives in their regions as well as nationally.

Across all the events, products, and working relationships for which the evaluation team collected data in the spring of 1996 and 1997, participants and others who were familiar with the work of the Consortia generally praised their activities. Substantial numbers credited their participation in Consortia activities with making at least a moderate contribution to their knowledge, skills, and professional activities. In many instances, participants called the contribution "major" with regard to knowledge, skills, and individual or organizational behavior. In other cases, the Consortia added value by increasing opportunities for participants to communicate and collaborate with colleagues and peers who shared common concerns and tasks. At the institutional level, they added value by supporting or facilitating the next step in a project—sometimes one that was not in the original plan or budget but that became important later as the work progressed.

Intensive Work with Selected Sites

This work, which in the current grant period is conducted by six of the Consortia in response to an invitational priority set by the Department, entails concentrating resources and other assistance in a small number of schools, school districts, or other entities. Services to these sites included direct technical assistance, professional development, financial support, and, in some cases, research and evaluation assistance. However, packages of assistance varied from one Consortium to the next. By the spring of 1997, several important lessons had emerged from the Consortia's experiences in these sites:

- Careful targeting and reaching agreement on long-term efforts and availability of other resources have obvious payoffs, as does the Consortia's ability to broker additional resources from other institutions.
- Sites must make a clear commitment to working on specific improvement tasks and to work with the Consortia and other sources of assistance.
- As regional entities, the Consortia must strike a balance between the large, concentrated resource investments required for effective work in the intensive sites and regional service and visibility.

Professional Development

Consortia professional development activities reviewed in the evaluation include events of several days' duration for various regional groups (often with longer-term follow-up); programs of local mini-grants and stipends to local groups and individual teachers and other educators; and intensive, sustained work with small groups of teachers

and others at selected sites, including some that the Consortia describe as "intensive sites." Participants in these professional development activities generally praised the Consortia for the quality of these offerings and the contributions to skills and knowledge. Most participants surveyed said that they were doing something differently as a result of the professional development they received. In addition, the evaluators found that:

- The Consortia tended to achieve the most impressive results in professional development when they worked with individuals, and, especially, with organizations that had a commitment to do something—to deliver services to others or to engage in organizational change.
- Most participants found a good fit between the activities' purposes and their professional responsibilities and existing capacities.
- Long-term, direct work with groups of teachers stimulated professional conversations and experimentation with new classroom practices, but more depth and persistence are probably necessary for teachers to change their classroom instruction—persistence that may be difficult to achieve, given fluctuations in participation by some teachers in some sites.

Support for Teams and Networks

The Consortia have convened and supported state teams and regional networks to establish links to the field and to provide opportunities for educators to work together on common tasks. Members of these groups worked in colleges and universities, state education agencies, intermediate education agencies, local school district offices, schools, and other organizations. Many were grantees of federally funded programs, such as the National Science Foundation's Statewide Systemic Initiatives and the Department's Eisenhower State Curriculum Frameworks Projects, and most were involved in efforts to reform mathematics and science education. The Consortia provided financial and logistical support to the teams and networks and they made substantive contributions to these groups' myriad activities. Members of the teams and networks reported that they valued their participation in these groups for providing opportunities to open new lines of communication with individuals active in reforms whom they might not otherwise have met, to discuss important issues, and to forge new working relationships within their states and across their regions. The evaluators also found that shifting priorities within states and the presence or absence of major reform initiatives greatly influenced the work of these groups, especially the state teams.

Other, specific findings about the Consortia's support of team and networks included:

- A large majority of members said that the work of the teams and networks was closely related to important reform efforts.
- Significant numbers of the participants, particularly those on the state teams, reported that the activities supported by these groups represented important contributions to reforms in mathematics and science education.
- From the Consortia's perspective, working with and through the teams helped connect them to the field and enhanced their credibility as sources of support and assistance.

Dissemination of a Volume on Promising Practices

As part of their effort to respond to the charge to disseminate exemplary mathematics and science education instructional materials, the Consortia jointly developed *Promising Practices in Mathematics and Science Education* and published it in 1995. This volume, which was widely disseminated by the Consortia, provides brief descriptions of promising programs and practices. The surveys indicate that:

- Recipients who remembered receiving the book, 62 percent of those surveyed, found the book reasonably useful for the purposes of gathering information or staying up to date professionally.
- Recipients reported little change in behavior following receipt of the book.

The evaluators concluded that as a dissemination activity, the distribution of the book was successful. However, the evaluators also concluded, along with the Consortia, that, absent any follow-up support for implementation, this kind of activity is unlikely to have much impact on reform efforts.

Use of Technology

In general, the Consortia went beyond their mandate and used technology in a variety of ways to achieve the purposes of the program. In examining the Consortia's use of technology, the evaluators found that:

- All Consortia had established World Wide Web sites, but the sites varied in sophistication and the amount of information they contained.
- Several Consortia facilitated the work of teams, networks, and other groups by establishing and maintaining electronic networks among the members.
- The Consortia were involved, to varying degrees, in providing professional development, technical assistance, and publications that promoted the use of technology in education, particularly the use of the Internet as a resource for communication, professional development, and instruction.

Networking and Coordination

This evaluation also reviewed the Consortia's ongoing networking and coordination efforts, including the development of a set of performance indicators, which was required under the Government Performance and Results Act. The evaluation team concluded that the Consortia's efforts to work together, with the ENC, and with others have had some important payoffs, including the following:

- Cross-Consortia task forces that developed products for use by all the Consortia helped achieve economies of scale and allowed all of them to capitalize on the strengths of individual Consortia.
- The development of the Cross-Consortia Descriptive Data System and program performance indicators have the potential to contribute to the Consortia's capacity to reflect on, describe, and assess the quality and impact of their work, and will help the Department monitor the work of the individual Consortia, as well as the Regional Consortia Program itself.
- Collaboration with the ENC became a fairly routine part of Consortia operations and produced benefits in dissemination of a broad range of materials.
- All the Consortia worked with major federal mathematics and science education reform initiatives, including the National Science Foundation's systemic initiatives and the Eisenhower State Curriculum Frameworks Projects.
- The Consortia's work with other technical assistance centers, including the technology technical assistance centers, the desegregation assistance centers, and the comprehensive technical assistance centers, showed several promising starts but had not yet matured.

As in other areas of their work, determining which of these partnerships represents the best use of their limited resources has been an important strategic decision for the Consortia. The Consortia have had to weigh these opportunities against each other as well as other options they have before investing resources, and they have had to assess the impact of their contributions once the investments were made.

Concluding Observations and Challenges for the Future

Looking back over 5 years of institutional development and services, this evaluation concludes that Consortia have added value to the nation's mathematics and science education reform initiatives. A second conclusion is that the Consortia have matured as organizations, both in terms of their capacity to provide a variety of services and to work in concert with a variety of other players in mathematics and science reform. Accordingly, since the early years of the program, the individual Consortium portfolios have taken on a clearer focus. By the spring of 1997, the Consortia's portfolios of

activities and services had become relatively stable, changing only as individual tasks and activities were completed and others were initiated either in response to requests from the field or to invitations and requests from the Department.

The continued development of the Consortia reporting system and of the Regional Consortia Program's performance indicator system have the potential of adding more clarity and focus to the program's purpose, particularly as future national evaluations and the Consortia's own internal evaluations report on the Consortia's performance against the new performance indicators.

Clarity of purpose and focus is critical because the Regional Consortia Program and the individual Consortia continue to confront the difficult choices inherent in the omnibus character of the program's charge and priorities from OERI and Congress, as well as the diverse—and sometimes changing—needs and priorities of their regions. The Consortia have tried to do many things, but they are not big enough—in terms of staff and resources—individually or collectively, to do everything in improving mathematics and science education. At the same time, the program is neither small enough nor yet secure enough to pick a tightly specified mission and stick to that mission. To the extent that this tension informs an ongoing dialogue about what the Consortia can and should do and guides thoughtful decisions about priorities, it will have a beneficial effect on the program.

Thus, the overall value added and obvious maturation of the individual Consortia and the Regional Consortia Program as a whole notwithstanding, the final conclusion of this evaluation is that important challenges remain—challenges to be addressed by the Consortia, by OERI, and by Congress as they plan for the future of the program. When viewed in the context of the ambitious goals for the Regional Consortia Program, the current annual funding level of $15 million looks like a relatively modest investment in solutions to large and complex issues. Consortia collaborations to achieve economies of scale and to take full advantage of the special capacities of individual Consortia coupled with assistance strategies that leverage resources from other institutions and programs have helped stretch these limited resources. These observations as well as similar observations about elements of the Consortia's work point to a recurring theme in the evaluation findings: the importance of making strategic choices about investing limited resources to achieve maximum impact. Therefore, it is incumbent on both OERI and the Consortia to continue seeking clarity about the program's mission and how well that mission is carried out; to set appropriate expectations for the quality, scope, outcomes,

and impact of the Consortia's portfolios of activities and services; and to monitor the extent to which those expectations are met.

I. INTRODUCTION

This report analyzes the contributions that the Eisenhower Regional Mathematics and Science Education Consortia have made to the nation's reform of mathematics and science education. Congress first authorized the Regional Consortia Program in 1990 under the Excellence in Mathematics, Science, and Engineering Education Act (P.L. 101-589, Title II). The program was reauthorized under the Improving America's Schools Act of 1994, IASA or (P.L. 103-382, Title XIII, Part C). The reauthorizing legislation reaffirmed the Consortia's two main functions:

- Disseminating exemplary mathematics and science education instructional materials.
- Providing technical assistance for the implementation of teaching methods and assessment tools for use by elementary and secondary school students, teachers, and administrators. (Sec. 13301)

In addition to carrying out these two broad statutory functions, the Consortia have had to respond to a number of other charges during the past 5 years. These included a lengthy list of authorized activities and invitational priorities requiring the Consortia to work in concert with other initiatives addressing standards-based systemic reform and with various state and local programs. In addition, the Consortia responded to invitations from the U.S. Department of Education (ED) to conduct a variety of short-term projects. Consequently, the Consortia provide an array of services to states, federally funded and privately funded initiatives, school districts, schools, and community organizations. They offer technical and financial assistance, professional development, dissemination, and forums for communication.

The Regional Consortia Program supports 10 Consortia (Exhibit 1). Eight of the 10 current Consortia have received support since October 1992. The two new Consortia that won grants in the most recent competition (September 1995) are the Eisenhower Regional Alliance for Mathematics and Science Education Reform (Regional Alliance) and the Science and Mathematics Consortium for Northwest Schools (SMCNWS). Seven of the current Consortia grants were awarded to organizations that also held contracts for regional educational laboratories. In fiscal year 1993, the first year of support, funding for individual Consortia ranged from $998,401 to $1,550,899, with most of the Consortia receiving between $1.1 million and $1.2 million. In the second grant period (beginning October 1995), each Consortium was funded at $1.5 million annually for 5 years.

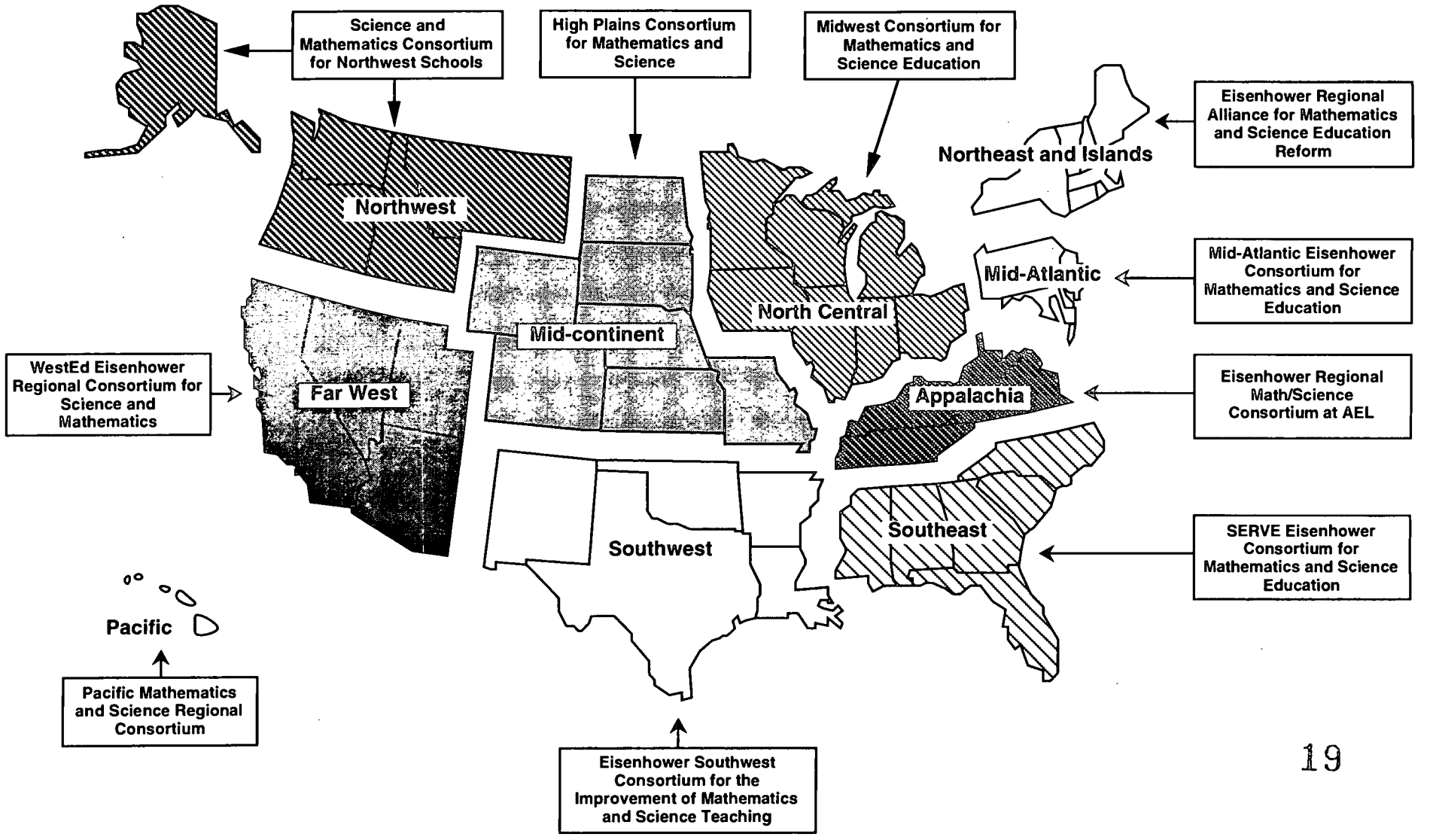


Exhibit 1 EISENHOWER REGIONAL CONSORTIA PROGRAM

When viewed in the context of the ambitious goals that were established for the Regional Consortia Program, these funding levels look like relatively modest investments in solutions to large and complex issues.

Evaluation Methods

This report presents findings from all four years of the evaluation. However, given that the evaluation's most intensive data collection activities occurred during the spring of 1996, this report relies most heavily on data from that period. More recent information gathered during the spring of 1997 is highlighted throughout the report.

Spring 1996 data collection was designed to elicit participants' views on the outcomes or attributes of the following categories of Consortia activities:

- Professional development, because skill building for the field is a vital component of any technical assistance program.
- Support for teams and networks, which has been a distinctive and apparently resource-intensive strategy of this program across many (although not all) of the Consortia.
- Dissemination of information about promising practices, which responds directly to a key part of the legislative charge.

Although only a portion of the Consortia's activities and services, these categories and the individual activities within them represented important elements of the Consortia's work. This evaluation examined mainly those activities that in spring 1996 were (1) relatively mature, (2) recently completed, (3) relatively large investments of Consortia resources, or (4) key parts of individual Consortia portfolios.

In addition, the evaluation looked at how the Consortia have used technology for dissemination, networking, training, and technical assistance activities. Finally, the evaluation examined the Consortia's own coordination and networking activities because the Consortia are required to work with each other, the Eisenhower National Clearinghouse (ENC), other technical assistance providers, and mathematics and science education reform initiatives.

Data collection activities completed in the spring of 1996 included the following:

- Customized surveys administered by mail to participants (or recipients of a product) in each category of Consortia activities. (Copies of the surveys and a summary of the procedures are included in Appendix A.)

- On-site and telephone interviews with participants and with Consortia directors and staff.
- Observations of a small subset of activities.
- Telephone interviews with state and local program administrators who were familiar with the work of the Consortia.
- Review of documents (e.g., grant proposals, annual reports and refunding requests, Consortia products, internal evaluation reports).

Data collection activities completed in the spring of 1997 were intended to update information on the Consortia's overall portfolios of activities and services, including their working relationships with other federal mathematics and science education reform initiatives and technical assistance centers, to review Consortia mechanisms for quality control, and to review progress in work with "intensive sites." To accomplish these goals, spring 1997 data collection typically included telephone interviews with Consortia directors; professional staff, including the Consortia staff evaluators; and a member of each Consortium's regional advisory board or other key advisory group, such as a state team. In addition, the evaluators reviewed a variety of documents, including the annual refunding requests submitted by the Consortia in the spring of 1997.[1]

Organization of the Report

Following this introduction, the report begins with a brief overview of the evolution of the Regional Consortia and an examination of the Consortia's recent work with intensive sites. The next three sections present, in turn, findings about the effectiveness and quality of selected Consortium activities in (1) professional development, (2) support for teams and networks, and (3) dissemination of information about promising practices in mathematics and science education. The report then discusses the Consortia's use of technology to augment their services, as well as their efforts to promote the use of technology in improving mathematics and science education generally. Following that, there is a review of the Consortia's collaborative and networking activities, highlighting the development of the program performance indicators and the Consortia's work with

[1] At ED's direction, this report combines the Second Interim Report, completed by the contractor in 1996, and the Final Summary Report, originally scheduled for completion in 1997. ED's request that this report combine the Second Interim Report and the Final Summary Report came after planning and data collection in the spring of 1997 were completed. Therefore, data collection during that period did not specifically focus on following up on all activities that were in progress during the earlier round of data collection. Wherever possible, this report does update earlier data.

other technical assistance providers and major mathematics and science education reform initiatives. The last section of the report contains the evaluation team's overall conclusions about the evolution and work of the Consortia during the period covered by this evaluation. It also comments on directions for the continued development of the Regional Consortia Program.

II. EVOLUTION OF THE REGIONAL CONSORTIA PROGRAM AND THE CHALLENGE OF WORKING WITH INTENSIVE SITES

Evolution of the Regional Consortia Program

When the Consortia first began operations in 1992, they faced a number of challenges. To meet these challenges, they had to build their organizational capacity and market themselves as potentially valuable resources and allies, so that when they came to the reform table, they had something to contribute. They also had to find ways of collaborating with each other so that the Regional Consortia Program would become greater than the sum of the individual parts. In the First Interim Report of this evaluation, the evaluation team described the challenges facing the Consortia as follows:

> First, and perhaps most important, they [the Consortia] were asked to fulfill an ambitious agenda ranging from giving direct assistance to classroom teachers to supporting states in systematically reforming their entire educational systems. Indeed, many of the specific tasks they were asked to take on—implementing new approaches to preservice education, for example—posed technical and political problems that many of the nation's best minds and institutions have been struggling with for decades.... Second, among the key targets of their assistance were state-level entities with established norms, political agendas, and technical capacities. Finally, by focusing on standards-based reforms, the Consortia were entering an already-crowded reform arena. (Haslam, Colopy, & Turnbull, 1996, p. 10)

By the end of the first grant period, the Consortia had generally succeeded at the tasks of building institutional capacity and establishing themselves as players in the mathematics and science education reform arena. They had also learned important lessons about the strategies and benefits of working with each other, with the Eisenhower National Clearinghouse, and with other entities in their regions. Finally, as the evaluation team observed in the conclusions to the First Interim Report:

> One of the basic dilemmas the Consortia face is whether to invest their relatively modest resources in activities that reach large numbers of people in limited ways or concentrate on serving a relatively small number of people and programs more intensively. The overall portfolio of Consortia activities reflects efforts to do both. (Haslam, Colopy, & Turnbull, 1996, p. 58)

As this report suggests in several places, the Consortia continue to face this dilemma and the attendant changes of making sound strategic choices about how to invest their resources.

The two new Consortia funded in 1995 faced similar challenges. They had to build new organizations and establish working relationships with other organizations in their regions. Nonetheless, they had one advantage: they could draw on the experience of the other eight Consortia. Evaluation data from the spring of 1996 suggest that the Regional Alliance was able to move ahead with its work and that the Science and Mathematics Consortium for Northwest Schools (SMCNWS) was less successful. Subsequently, and with considerable support and encouragement from OERI and other Consortia, SMCNWS has gradually developed its capacity and established reasonably solid working relationships with the other Consortia and with most of its regional stakeholders. The progress that this Consortium made is evidence of the growing strength of the Consortia network and the partnership between the Consortia and OERI.

From October 1995 through the spring of 1997, the program portfolio of activities and services, as well as the portfolios of individual Consortia, generally remained stable in terms of the types of clients served and the strategies the Consortia used to serve them. Thus, the Consortia continued to provide a variety of professional development, training, and technical assistance at both the state and local levels. They supported a number of state teams and regional networks that brought together regional, state, and local leaders in mathematics and science education to discuss issues of common concern and to advise the Consortia about their needs for assistance and support. The teams and networks also used Consortia resources to organize and support state and regional projects. The Consortia, often in collaboration with other Consortia and the ENC, produced and disseminated an array of materials related to improving mathematics and science education. They also disseminated materials developed by other sources—often as part of Consortia support for individual mathematics and science education reform initiatives. These materials included the Consortia's newsletters, descriptions of what the Consortia call promising and exemplary practices, and guides to resources that assist educators in their reform efforts. Consortia reports indicate that these products have reached thousands of people across the country. Using many of these same assistance strategies, the Consortia worked with major state and local mathematics and science education reform initiatives.

While the overall portfolio of Consortia activities and services remained relatively stable, individual Consortium activities waxed and waned as staff completed some tasks and replaced them with others. For example, as the Statewide Systemic Initiatives (SSIs) supported by the National Science Foundation began to complete their work, the

Consortia began to redirect their efforts to the Urban Systemic Initiatives (USIs) and Rural Systemic Initiatives (RSIs), both of which started more recently. To illustrate: work with two RSIs that focused, in part, on improving the education of Native American students led the High Plains Consortium to increase attention to this area in its portfolio of work.

Responses to invitations from ED, such as invitations to assist in pilot testing new criteria for identifying promising and exemplary practices or in communicating information about the Third International Mathematics and Science Study (TIMSS), required bursts of activity and some shifts in staff assignments and resource allocations. These did not fundamentally alter overall directions and service delivery strategies.

Throughout the evaluation, one of the most difficult challenges facing the evaluation team has been to analyze and describe the work of the Consortia clearly and comprehensively. The difficulty of capturing an overall sense of the Consortia's work mirrors a real policy problem facing the Regional Consortia Program. In the beginning, the program lacked a tight formulation of its purpose and methods. To some degree, this lack of focus was inevitable in a technical assistance program, which had to retain its capacity to improvise as opportunities warranted. To the credit of ED and the grantees, by the spring of 1997, a clearer program formulation was beginning to evolve. Beginning in the spring of 1996, in compliance with the Government Performance and Results Act, ED and the Consortia worked together to develop performance indicators that succinctly framed the program's intentions and against which its successes and failures could be measured. The final draft of the performance indicators was submitted to the Acting Deputy Secretary of Education in September 1997. (The draft of the performance indicators is included as Appendix B.) These indicators and subsequent reports on Consortia performance that address the indicators should yield a clearer sense of program purposes and accomplishments. In the meantime, findings from this evaluation can help point to fruitful directions for the Consortia's initiatives.

Work with Intensive Sites

The solicitation for the second grant period (beginning in October 1995) called on the Consortia to "focus their activities to achieve maximum impact." To do so, they were expected to provide "training and assistance to classroom teachers, administrators, and other educators to enable them to instruct other teachers, administrators, and educators...." In the shorthand of the program, this work became known as work with

"intensive sites." The remainder of this chapter describes the Consortia's early efforts to address this priority.

In response to an ED invitational priority in the second grant period, the Consortia have paid increased attention to—and some Consortia have made increased investments in—direct services at the local level. OERI staff held out the expectation that, in addition to making important contributions at the local level, work in the intensive sites would result in some institutional learning by the Consortia.

The Consortia embraced the task of working with intensive sites in quite different ways, revealing both the diversity in the program and the very difficult choices that organizations with limited resources make in tackling difficult and demanding tasks. In the spring of 1996, the evaluators' review of individual Consortium portfolios showed that some of the Consortia had already begun to target at least some of their technical assistance and professional development to the local level. Other local-level services, however, were just getting under way when the data were collected, and it was too soon to assess their impact and effectiveness.

During the spring of 1997, the evaluation team collected additional descriptive information on Consortia activities and services in intensive sites. Five of the 10 Regional Consortia indicated that they conducted work in intensive sites. Exhibit 2 summarizes Consortia's accounts of this work.

In addition to the five Consortia whose work with intensive sites is summarized in Exhibit 2, the High Plains Consortium's (HPC) Action Research sites, which the chapter on professional development in this report also discusses, represent another example of work with intensive sites. When data were being collected during the spring of 1997, the remaining four Consortia reported that they were not working with intensive sites, although several reported that they anticipated doing so in the near future. To be fair, there is no agreement about what constitutes intensive sites. All Consortia work on the local level. Thus, the evaluation chose to focus on the work of those Consortia who declared that they worked with intensive sites.

Services to intensive sites included direct technical assistance, professional development, and, in some cases, research and evaluation assistance and financial support. Several Consortia reported that they also brokered additional assistance to these sites. Several Consortia also augment their services to individual sites, with large-scale institutes that bring the sites, or site representatives, together for training and professional

development. Typically, these activities occur in the summer to facilitate participation by school staffs.

Exhibit 2

REGIONAL CONSORTIA SERVICES TO "INTENSIVE SITES"

Consortium	Number of Sites	Selection Criteria	Strategies
Regional Alliance	37 schools	Schools committed to long-term reform in math, science, and technology	Schools are members of Alliance Schools Network. Consortium provides or brokers assistance, and statewide action team identifies critical friends. Consortium provides $2,000 to support schools participating in the network.
Consortium at AEL	Nine schools	Public and private schools with (1) at least 60 percent of students eligible for free or reduced-price lunch or tuition, (2) documented progress toward implementation of school improvement plan, and (3) leadership committed to working with the Consortium on a long-term plan	Consortium provides $750 mini-grant and direct assistance in needs assessments. Additional technical assistance to follow, pending availability of staff/consultants. Consortium also brokers other assistance, especially from institutions of higher education.
SERVE Consortium	One region in an urban district	Not applicable	Consortium provides training and technical assistance as needed.
Southwest Consortium (SCIMAST)	19 district professional development projects (included in two SCIMAST assistance programs)	Site-level commitment to long-term, high-quality professional development to improve mathematics and science education	Consortium provides $20,000 a year for 5 years for Professional Development Awards (PDAs) and $1,200 a year for customized training sites. Additional assistance to PDA sites includes ongoing technical assistance and annual meetings of grantees.
Midwest Consortium	Two to three projects per state, including schools, districts, or groups of school districts	Commitment to working with the Consortium on development activities	Consortium offers sites "research support; evaluation design; technical assistance, planning, sharing expertise/best practice, and acting as a critical friend and capacity builder."

Although the Consortia asserted that the goal of all of this work was to improve student learning, their strategies, especially the definitions of "intensive," were quite different. Thus, the professional development grant program operated by the Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) provided substantial long-term support—$20,000 a year for several years—to local professional development projects that were explicitly linked to improving instruction. This program is discussed in more detail in the chapter on professional development.

According to staff at the Regional Alliance, schools in the Alliance Schools Network had to be committed to long-term improvement efforts, but individual improvement goals and strategies varied considerably. Intensive site work by the Consortium at AEL included completing a needs assessment for each of nine low-performing schools and following up the results with the development of a plan for technical assistance that included assistance from the Consortium as well as assistance from other sources, including nearby institutions of higher education, state mathematics and science reform initiatives, and the comprehensive technical assistance center also located at the regional laboratory.

The Midwest Consortium for Mathematics and Science Education (Midwest Consortium) worked with intensive sites (schools, districts, and groups of districts) that had already moved toward improvement and were willing to join in what the Consortium called a "co-development" effort. In a second example of this Consortium's intensive site work, Consortium staff, with assistance from the North Central Regional Education Laboratory, the Consortium's parent organization, worked with a district team to develop a network collaboration project that is intended to result in the implementation of new elementary school curricula that incorporate technology. The Consortium anticipates that the curricular models that are developed will be available to all 28 of the schools in the district. The purpose of these and other co-development activities was to continue work on local improvement tasks and to generate products that would be of general use to the field. As these and other examples suggest, an important lesson learned from these experiences is that there must be clear evidence of commitment on the part of the site—both commitment to the specific tasks and commitment to working with the Consortia.

Consortia directors and staff were generally optimistic about the prospect that these activities would pay off for participating sites, and saw their efforts as likely to have significant impact. Most also noted the benefits of this work for the Consortia. "On the positive side, it provides opportunities for action research, the development of models."

The Midwest Consortium's 1997 refunding request summed up the intended benefits of its co-development this way:

> The intensive sites provide a place for action research, product development, field testing, dissemination, [development of] craft knowledge, and credibility. The wisdom and resources are then shared through workshops and presentations by [Midwest Consortium] staff, through trainer-of-trainers efforts by partners, such as state departments of education, intermediate units, SSIs, USIs, and district staff.

Working with intensive sites also posed some challenges for Consortia. As a staff member at the Eisenhower Consortium for Mathematics and Science Education at SERVE explained:

> Originally in the proposal there were two in each state, but after working with [a district] and that being only intensive for a year, we really had to rethink that commitment. It takes so much more time than anyone had ever imagined. We would rather do less and do a really good job than to spread out and not do a good job.

Directors and staff in other Consortia shared this concern about the costs of working in intensive sites. A staff member at the Consortium at AEL talked about a second challenge that can emerge in particularly low-performing sites:

> Direct service is a double-edged sword because of the selection criteria.... The theory is to pick schools where we could really do good work and that we could work with. But in these schools, the people in charge may not care. To latch on to a school and make a commitment to it...you may have to work more on buy-in. They may not want help. I have called some schools at least five times to set up a meeting, and only one has responded.

Working with sites that have little or no progress on their own and that have limited capacity to do so, points to the need for substantial investments of time and money just to get started.

A third challenge—and risk—in these long-term, intensive relationships was turnover in local staff. In a number of cases, Consortia staff expressed frustration with the fact that just as they were building strong working relationships with local leaders and staff—a long-term process in itself—these individuals were reassigned or took on other, competing responsibilities. "One month we would go to a meeting and agree on some plans. When we returned for the next meeting, there was a whole new group of people and we pretty much had to start over" is the way one Consortium staff member described it. Such turnover has implications for the level of intensity at a site. Although a Consortium might continue to work at a high level of intensity, participant turnover may

mean that few, if any, participants actually receive intensive services. Indeed, some participants may even experience these services as a one-time event. Thus, the overall result may be intensive from the Consortium's perspective but nonetheless diluted from the recipient's perspective.

Work with intensive sites poses a real dilemma to the Consortia. Experience thus far shows that work with intensive sites has the potential for some important payoffs, both for the sites and for the Consortia. At the same time, these services are relatively expensive, and the Consortia may incur substantial start-up costs as they attempt to build long-term partnerships. Their activities are also vulnerable to rapid shifts in local staffing and priorities, both of which can seriously undermine local commitment to continue. As regional entities, the Consortia must strike a balance between large, concentrated resource investments and regional service and visibility. And, as several Consortia are learning, their ability to broker additional resources from other institutions has the potential to significantly increase the amount of help available in the intensive sites.

III. PROFESSIONAL DEVELOPMENT

Training teachers, administrators, and other educators was a priority in the Consortia's statutory list of authorized activities. The original law suggested using a training-of-trainers strategy, saying that the Consortia may:

> provide for the training of classroom teachers to enable such teachers to instruct other teachers, administrators, and educators in the use of...instructional materials, teaching methods, and assessment tools. [Sec. 13302 (3)]

As discussed in the preceding chapter, OERI's invitational priorities for the second grant period advised the Consortia to work in a sustained and intensive way with selected schools and districts, saying that this approach reflects research showing the importance of a long-term commitment in professional development. As a result, the Consortia employed both strategies in an effort to get an effective bang for a limited buck.

In this chapter, the report examines 11 Consortia-sponsored professional development activities, characterized in Exhibit 3. The bulk of the data collected for this examination—including the surveys, interviews, and a review of any evaluation data available from the Consortia—was gathered in the spring of 1996. In addition, reviews of annual reports and interviews with Consortia staff conducted in spring 1997 provide updated information on a number of these activities.

Discussions with all the Consortia indicated that these 11 professional development activities were the only ones for which any data on effects could reasonably be obtained by May 1996. The survey data presented here came from participants in six professional development activities. These were the professional development activities for which the Consortia provided direct service and had complete participant records.

The chapter first describes various categories of Consortia-sponsored professional development activities. Next, the survey sample is presented and the professional development participants are described. This is followed by a discussion of the participants' judgments of the quality of the professional development they received. The chapter then discusses the effects of the professional development activities on the participants' skills and knowledge. Next, the chapter presents evidence as to the impact of the professional development on the participants' practice. The chapter concludes with a discussion of the strengths and weaknesses of these Consortia activities.

Exhibit 3

OVERVIEW OF PROFESSIONAL DEVELOPMENT ACTIVITIES EVALUATED

Activity (Consortium)	Purpose/ Content	Consortium Role	Number of Participants	Duration	Participants' Job Responsibilities	Participants' Purposes
Regional Training Project (AEL)	Train trainers in standards-based instruction	Organized the event	350	2 days	74 percent elementary/ secondary teaching	Be resource to others
TAAMSS (SERVE)	Train leaders in reform process	Organized the event	75	3.5 days	72 percent professional development/ technical assistance	Be resource to others; strengthen organization; engage in major change
TOT (SCIMAST)	Train trainers in instruction and change processes	Organized the event	36	4 days	57 percent local administrators	Engage in major, planned organizational change
Celebrating Success (SERVE)	Focus on promising practices and change process	Organized the event	134	3 days	62 percent professional development/ technical assistance	Strengthen organization; individual learning
Professional Development Awards (SCIMAST)	Support for long-term change efforts	Provided grants to organizations	15 grantee sites/year	5 years	Primarily universities and school districts	Change instruction through multiyear professional development
Participant Support (SMCNWS)	Support attendance at professional development	Provided grants to teachers	400 (summer 1996)	Variable	Primarily teaching	Individual learning
Action Research (HPC)	Collaborate in intensive professional development	Organized teacher study groups; visited groups and classrooms	About 15/site	Monthly meetings over school year	Teaching	Individual learning; course credit at one site
Models Learning Network (Midwest)	Collaborate in intensive professional development	Organized teacher study group	20	Monthly meetings over half year	Teaching	Individual learning and strengthening organization
Arizona Journey Schools Program (WERC)	Work with schools on systemic reform	Organized and led series of institutes and workshops	33 schools	6 events of 2-5 days over 2 years	School teams	No data from participants
Customized Training (SCIMAST)	Help selected sites with training in a topic chosen by site, emphasizing constructivist teaching	Selected sites; negotiated content; made multiple visits	Small number of schools or districts	10 days of training and follow-up over at least a year	Teachers in school teams; principal must participate	Limited data from participants; individual and organizational change seem to be purposes
Project Soar (SERVE)	Provide intensive support to an urban subdistrict	Developed local leadership team; helped organize conference	20 leaders; 200 teachers	Several months so far; 5-day conference	Primarily teaching	Limited data from participants; teacher leadership in instructional change is district's purpose

Consortia-Sponsored Professional Development

Although the categories are not mutually exclusive, the Regional Consortia's professional development activities typically employed a training-of-trainers strategy or provided sustained and intensive work with selected sites. The training-of-trainers model typically involved professional development events lasting less than a week, and usually targeted professional development providers or administrators. Examples of the training-of-trainers professional development included:

- The Regional Training Project of the Consortium at the Appalachia Educational Laboratory (Consortium at AEL) offered 2-day sessions for individuals who become, in turn, responsible for providing workshops to teachers on the national standards in mathematics and science education and ways of implementing these standards in classrooms. According to the 1997 annual report of the Consortium at AEL, the focus of the Regional Training Project was on the state curriculum frameworks in each of the four states in the region. Through this training-of-trainers approach, the Consortium intends to provide indirect service to all of the region's 27,500 K-12 mathematics and science teachers.
- The SERVE Eisenhower Consortium for Mathematics and Science at SERVE's 3-day "Celebrating Success" Leadership Conference, which is part of the Promising Practices Leadership Institute, focused on 18 promising practices in mathematics and science education from the region, with attention to the change processes that would be required to implement new practices. The Consortium also describes this Institute as a dissemination activity that augments the dissemination of printed materials, such as the one discussed in more detail in this report's chapter on dissemination.
- Technical Assistance Academy for Mathematics and Science Services (TAAMSS), offered by the Consortium at SERVE, provided professional development for trainers committed to systemic reform. The subject matter was the reform process: building support for change; developing local leadership; teaching adults; and reform topics such as frameworks, standards, and equity. Each participant was required to conduct at least two workshops during the rest of the school year or the summer, using the materials from TAAMSS. According to the Consortium's 1997 annual report, this focus continued in 1996-97. The Consortium also reported that, beginning in May 1997, this activity "will include advanced strategies and tools related to reflection, coaching, program monitoring/feedback and providing continuous support" and that the training will be augmented by on-site observations by Consortium staff.

As the TAAMSS example suggests, the Consortia have tried to include follow-up and more sustained support in the training-of-trainers strategy. The Consortia's work with selected sites represents even more intensive and ongoing support. In contrast to the more

standard, large-scale offerings with relatively polished presentations, these activities had a more participatory, evolving character. Examples of this approach included:

- Action Research, conducted by the High Plains Consortium (HPC), operated in two sites: St. Louis, where participants were 15 elementary teachers from different schools, and a Denver school where 15 teachers joined this study group, which was an element of their school improvement plan. Participants discussed issues of common concern in small groups, conducted research projects in their classrooms, and made presentations to the group. The 1997 annual report indicates that Action Research also operates in Wyoming.
- A more recently formed group was the Models Learning Network (MLN) facilitated by the Midwest Consortium for Mathematics and Science Education (Midwest Consortium). The MLN met five times between January and June 1996. Participants were mathematics and science teachers from elementary, middle, and secondary grades in 20 Chicago-area school districts. Between meetings, participants were expected to study materials or to prepare presentations.

At least one Consortium embedded the training-of-trainers strategy in its efforts to work intensively with selected sites. SCIMAST's Professional Development Awards (PDA) program provided $20,000 to each of 15 sites, for a total of $300,000. Applicants were required to document how they would fulfill several criteria: commit to at least 10 days per year of training and follow-up; contribute local resources; involve participating teachers in planning; carry out a multiyear plan; emphasize depth over breadth; and focus on constructivism, problem solving, hands-on experiences, integrated technology, and alignment with standards. SCIMAST offers an annual Training of Trainers (TOT) event to PDA participants. The event includes sessions on the process of learning, instructional strategies in mathematics, the NCTM standards and instructional alignment, professional development, the PDA program, and technology resources.

Three other Consortia sponsored professional development activities also focused on selected sites. Customized Training was an established activity category for SCIMAST. The Consortium selected a limited number of sites to work with, requiring each prospective site to demonstrate the following: participation by a large number of teachers in each school (as opposed to one teacher per school), attendance and support by the principal, 10 days of training and follow-up, practice with students, interest in constructivist teaching, and cost sharing. Each engagement included a training segment of 5 to 7 days plus two follow-up visits with classroom observation and additional training.

Through Project Soar, the SERVE Consortium assisted one region of Dade County (Florida) Schools with what staff called "the works" in assistance and professional

development. Beginning in January 1996, this activity focused on developing a 20-member leadership team from five feeder patterns and pulling another 200 teachers in school teams in these feeder patterns into professional development activities. As noted in the preceding chapter, SERVE's assistance to this region of the Dade County Schools represents the Consortium's intensive site work.

The Arizona Journey Schools Program (AJSP) began as an initiative of the Arizona Department of Education, with assistance from the WestEd Regional Consortium (WERC). When the program's originators left the state department in the wake of major philosophical and organizational changes, WERC moved from a supporting to a leadership role. The content of institutes and workshops included systemic change, instruction, assessment, and professional development. This activity repeatedly convened school and community teams over a 2-year period that began under the Consortium's first grant.

In a different approach, the Science and Mathematics Consortium for Northwest Schools (SMCNWS), in the first year of its grant, sponsored a program called Participant Support, which provided stipends to teachers. It allocated $30,000 to each state in its region to underwrite up to a third of the travel costs for individual teachers to attend professional development activities. Teachers submitted applications discussing how the activity addressed their local reform plan and state goals in mathematics and science. In addition, 12 workshop organizers received awards of up to $6,000 to expand their summer offerings. An example is the arrangements made to allow teachers from four other states to attend summer training institutes supported by Idaho's Eisenhower Professional Development funds.

Participants in Consortia-Sponsored Professional Development

In this section, the participant survey results are examined in order to profile who participated in the Consortia's staff development activities. Achieving a good fit between a Consortium's purpose and participants—with respect to the roles they play in their organizations and the expectations they bring to professional development activities—is a key factor in the success of the activity. To begin, Exhibit 4 displays the sample sizes and response rates for participant survey data.

Each Consortium activity had a distinctive profile with respect to its participants' professional responsibilities (Exhibit 5) and purposes for participating (Exhibit 6).

Exhibit 4

MATHEMATICS AND SCIENCE EDUCATION REGIONAL CONSORTIA PROGRAM CUSTOMER SURVEY SAMPLE: PROFESSIONAL DEVELOPMENT

Professional Development Activity	Consortium	Total Participants	Sample Size	Surveys Returned	Response Rate (%)
Regional Training Project	Consortium at AEL	370	49	39	80
Technical Assistance Academy for Mathematics and Science Services (TAAMSS)	SERVE	77	38	28	74
"Celebrating Success" Leadership Conference		134	34	26	76
Training of Trainers (TOT)	SCIMAST	36	36	28	78
Action Research	HPC	30	30	17	57
Models Learning Network (MLN)	Midwest	20	20	15	75
Total		667	207	153	74

Exhibit 5

RESPONSIBILITIES OF THE PARTICIPANTS IN CONSORTIUM PROFESSIONAL DEVELOPMENT

Responsibilities	Percentage of Participants						
	All Participants	Regional Training Project	TAAMSS	TOT	Celebrating Success	Action Research	MLN
K-12 teaching	62	82	48	35	36	100	82
Postsecondary teaching	17	18	11	12	14	0	0
Administering local education program(s) or organization(s)	23	18	33	54	27	0	9
Administering state education program(s) or organization(s)	9	6	19	0	18	0	0
Professional development or technical assistance	41	32	70	46	59	0	18

Note: Columns may not sum to 100 percent because multiple responses were possible.

Exhibit reads: Sixty-two percent of the participants in professional development activities reported that their professional responsibilities included teaching at the elementary or secondary level.

Source: Customer survey.

Exhibit 6

PURPOSES FOR PARTICIPATING IN CONSORTIUM PROFESSIONAL DEVELOPMENT

Purposes for Participating	Percentage of Participants						
	All Participants	Regional Training Project	TAAMSS	TOT	Celebrating Success	Action Research	MLN
Keeping current professionally	74	79	74	46	64	71	64
Obtaining ideas or contacts that would strengthen my work	77	79	78	62	73	74	82
Obtaining ideas or contacts that would strengthen my organization's existing work	54	41	81	58	77	31	55
Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort	49	44	74	81	45	19	45
Being a resource to others	81	88	93	62	68	31	64

Note: Columns may not sum to 100 percent because multiple responses were possible.

Exhibit reads: Seventy-four percent of the participants in professional development activities reported that at least one purpose for participating was to keep current professionally.

Source: Customer survey.

Using the survey data, evaluators constructed rough profiles of the groups participating in each of the surveyed activities:

- TAAMSS participants in the Southeast, compared with participants in other activities, were especially likely to be professional developers or administrators of state programs. Almost all expected to be "a resource to others," in the words of the survey; most expected to strengthen their organizations or to engage in a major, planned organizational change.
- Of all these activities, Training of Trainers in the Southwest served the highest percentage of local administrators, and its participants were the most focused on

major, planned changes. (They were presumably referring to the change efforts supported by grants from SCIMAST under the Professional Development Awards program.)

- Celebrating Success participants in the Southeast included a fairly high proportion of professional developers but were not notable in their expectation of being a resource to others or engaging in major change.
- Regional Training Project participants in the Appalachian region were mostly teachers, almost all of whom expected to be a resource to others but whose intentions with respect to organizational change were modest.
- Participants in Action Research with the High Plains Consortium were all teachers. Relatively few of them expected organizational improvement or change to ensue from their participation in the activity; instead, they focused on the classroom level.
- Participants in the Models Learning Network in the Midwest were mostly teachers who participated to obtain ideas or contacts that would strengthen their work; some expected organizational improvements or changes.

Although their profiles varied in a number of respects, participants across activities had similar reasons for seeking individual professional improvement: 77 percent of them said that they participated for the purpose of "obtaining ideas or contacts that would strengthen my work."

In general, participation in Consortium professional development was strong. Across all the surveyed activities, 86 percent of respondents said they attended "everything." Single-event activities characteristically drew high rates of attendance. Participation was more sporadic in the longer-term, school-based activities—the Models Learning Network, where 6 of 11 respondents attended all meetings, and at the Action Research sites, where 10 of 16 did so. SCIMAST's Customized Training—which, like Action Research and the Models Learning Network, provided a series of professional development experiences over a long term—also experienced fluctuations in attendance. For example, at one site where evaluators observed training in the third year of a 3-year program, only about half of the participating teachers had also participated in the previous 2 years. Clearly, these findings reflected the time constraints that face practicing teachers, whose opportunities to attend professional development activities are typically limited. They could also reflect some degree of teacher turnover.

Participants' reports on the quality and effects of the Consortia's professional development activities inevitably reflected differences in the purposes, expectations, and commitment of different groups of respondents. The next section presents participants' reports on the quality of the professional development activities.

Participants' Ratings of Quality and Utility

Participants gave high marks to the quality of professional development offerings. More than 80 percent of respondents surveyed rated the Consortia's work as good or excellent in every respect. Ratings of excellent predominated with respect to accuracy and presentation (Exhibit 7).

Exhibit 7

PARTICIPANTS' RATINGS OF THE QUALITY OF PROFESSIONAL DEVELOPMENT

Rating	Percentage of Participants			
	Accuracy of Content	Presentation	Completeness	Depth
Excellent	60	56	43	34
Good	39	32	44	50
Fair	1	12	9	14
Poor	0	0	4	3

Note: Columns may not sum to 100 percent because of rounding.

Exhibit reads: Sixty percent of the participants in professional development activities rated the accuracy of content as excellent.

Source: Customer survey.

Breaking down the results by activity showed some differences in the overall quality that participants ascribed to them. TAAMSS rated especially high on all the scales. Training of Trainers stood out in one positive respect and in one negative: it received a high rating for accuracy (69 percent excellent) but a comparatively low one for presentation (35 percent excellent). In interviews, several participants criticized the presentation skills of some members of the SCIMAST staff. Nonetheless, they gave the overall activity very high marks.

The fact that participants gave comparatively low ratings to the quality of the Models Learning Network activity (relative to the very high ratings participants awarded other activities) may have reflected both the small number of participants (around 20) and the fact that the activity had only just started. It may also have reflected teachers' unfamiliarity and perhaps dissatisfaction with an activity in which they were expected to lead rather than more passively absorb presentations from outside experts. The Consortium staff member commented that the group initially asked for more outside help, but then learned to take more responsibility for leading the discussions. These survey results suggest that at least some participants may have remained uncomfortable with a more active role and continued to feel that something was missing. A clearer initial presentation of purposes and roles would have

helped, as the Consortium staff have recognized as a result of their early experience with this kind of work.

Survey respondents also reported that the activities in which they took part were closely connected to broader reform efforts in mathematics and science education: 76 percent characterized the connection as "close." The most notable exception was among teachers who participated in Action Research, who tended to think of "broader reform" as something that did not include them: 7 of 15 respondents chose the response "I don't know; I am not involved in broader reform efforts."

Across all surveyed activities, most participants (57 percent) considered their activity "a good start" toward achieving their purposes, and 36 percent said the activity had served their purposes "completely." Interestingly, participants who came to the activity with the clearest purpose in mind—those who were seeking help with a planned organizational improvement—were somewhat more likely to have had their purposes completely served; 49 percent of them chose this response. Next, the chapter turns to a discussion of the effects of the professional development activities on participants' skills and knowledge.

Effects on Participants' Skills and Knowledge

On average, participating in a Consortium professional development activity contributed in a "moderate" or "major" way to most participants' knowledge and skills in each of several domains (Exhibit 8). The extent of the contribution varied somewhat by the domain of knowledge. Participants reported the largest contribution to their knowledge and skills in professional development (where 86 percent called the contribution major or moderate).

In addition to these aggregate findings across all professional development activities, the evaluation team also reviewed responses for each activity. The activities that had the strongest focus on professional development were TAAMSS and Training of Trainers; 67 percent and 50 percent of participants, respectively, reported that these activities had made a major contribution to their knowledge and skills in professional development. These two activities had higher-than-average proportions of staff developers participating, and the preexisting interests of these participants probably explain some of their higher ratings.

Exhibit 8

PARTICIPANTS' REPORTS ON THE EFFECTS OF CONSORTIUM PROFESSIONAL DEVELOPMENT ON THEIR SKILLS AND KNOWLEDGE

Contribution	Math/Science/ Technology Education	Professional Development	Assessment/ Standard Setting	Planning	Collaboration/ Communication
Major	24	28	22	19	26
Moderate	52	58	42	44	40
Small	21	10	30	29	29
None	3	4	6	9	6

Note: Columns may not sum to 100 percent because of rounding.

Exhibit reads: Twenty-four percent of the participants in professional development activities reported that the activity made a major contribution to their knowledge and skills in math/science/technology education.

Source: Customer survey.

Some quotations from journals and feedback letters sent by Training of Trainers participants give a sense of the kinds of knowledge about professional development that participants gained:

> I will plan to include this activity in the professional development provided to teachers in our project.
>
> I learned more strategies for feedback that we will use.

Similarly, the evaluation data that SERVE collected on TAAMSS included many positive comments on this subject, such as this one:

> The Academy offered great insight into issues regarding professional development and reinforced views of working in the area of professional development.

This evaluation's findings about the contribution of Consortia activities to participants' knowledge and skills in professional development have an important bearing on the implementation of one part of the program's statutory charge: the law suggests that Consortia train classroom teachers to provide training to other educators. To do so effectively, one would expect that the Consortia should impart skills in professional development to participating teachers. This evaluation had a chance to look at the reported effects of a large effort of this kind, the Consortium at AEL's Regional Training Project. The purpose of this activity was to prepare participants, who were mostly teachers, to offer professional development to others. According to participants, however, the content of the training may

have fallen short of what they needed: only 18 percent credited it with contributing to their knowledge and skills in professional development in any major way.

This problem suggests that if Consortia faithfully carry out this legislative mandate, they should intensify their efforts to train teachers to be effective staff developers. Besides the Consortium at AEL's Regional Training Project, the SERVE Consortium's Project Soar faces a challenge in, as one district official described it, "being totally immersed in the concept of teachers as staff developers." Through the leadership development activities that have begun recently, the SERVE Consortium and the district should focus on developing teachers' staff development skills.

One activity stood out for its high level of attention to the domain of planning. Training of Trainers made a major contribution to the planning skills of 52 percent of its participants. The written comments that the SCIMAST Consortium collected from participants suggested that requiring school staff to attend Training of Trainers in teams was effective:

> Also extremely beneficial was the inclusion of the collaborators in the training session along with the school staff. This gave us an opportunity to discuss the training and its application to our project. We did so much planning after each daily session.

Finally, there was considerable variation in the extent to which participants learned about communication or collaboration. This variation reflected the diverse purposes of the activities. At the high end, 7 of the 11 participants in Models Learning Network (64 percent) reported that the activity had made a major contribution to their skills in communication and collaboration, 52 percent reported the same for TAAMSS, and 42 percent for Training of Trainers. The Consortium staff member working with Models Learning Network described the strides that school-based participants had made in communicating over the course of the project up to then:

> We saw a lot of change in the group. Each time we met, we revisited the purpose. Initially, the teachers treated it as a task force or a committee and asked what they were supposed to do. During this early period they often asked for outside help or resources. As we continued to meet, the group became more independent and interdependent. They came to rely on each other as experts. They tended to place much higher value on what each other brought to the activity than on things they could get from outside.

Action Research participants who were interviewed commented very favorably about the value of teacher discussions in this activity:

> The meetings gave us an excuse to talk about math content, which we otherwise wouldn't discuss.

> We would never have had cross sharing before, because there was never a place to share.
>
> This is not a plan from on high. You have to do it, to make your own decisions. Instead of feeling powerless by people telling us what to do, this made us feel powerful.

Two interviewees revealed that TAAMSS' focus on communication was particularly valuable. First, TAAMSS emphasized communication and collaboration as an essential foundation of the change process:

> The main point was: in order to make change take place, you must have everyone involved; stakeholders are integral to all change. We worked on how to involve them and move them along in the process.

Second, TAAMSS enabled participants to communicate with skilled colleagues from other organizations:

> There were very powerful, intellectual, and motivated people from different districts. You could see they could make changes in math and science. They were just regular teachers. I was in awe about what they could offer.

Despite a few specific areas where survey findings pointed to weaknesses, participants responded very positively when asked about the knowledge and skills they had gained. Professional development activities outstripped other kinds of Consortium activities (teams, networks, and dissemination of a book of promising practices) in their contribution to participants' knowledge and skills (as later chapters of this report will describe). This chapter turns next to the payoff from this skill building: the behavioral change that could be attributed to participating in Consortia professional development activities.

What Participants Have Done as a Result of Professional Development

Although this evaluation could not directly assess the extent to which participants changed their behavior as a result of their involvement with the Consortia, it did ask participants, through both surveys and interviews, to address changes in their own behavior. The evaluation inquired about behavioral change in three areas: individual professional practice, communication with others, and organizational policies or practices. Most participants reported behavioral change at the individual level, although the change was often only a first step.

Nearly two-thirds—62 percent—of the individuals who had participated in the activities surveyed for this evaluation reported that they had incorporated some new behavior into their jobs as a result of what they had learned. There was little variation across activities in this regard. Some variation was associated with the reason that participants took part in

the activity, however. Among those who were looking for help with a major, planned improvement effort, 75 percent reported incorporating something they had learned. This relatively high level of change is entirely plausible, since these participants were in the best position to put their new knowledge to work on the job.

Many Training of Trainers participants commented (in written feedback collected by SCIMAST) both that they had learned new things and that they were applying their knowledge:

> I felt that I learned and reaffirmed much about how a learning experience should be structured. I have already changed some of the methods I am using.
>
> I am leaving with more of an understanding about what is expected and what I can do to help. It was great!

Although participants in this and other professional development events testified to having made changes in their professional practice, participants in more intensive, sustained professional development experiences found out that sometimes the more one tries to change, the more one appreciates how much more change is needed. Action Research, for example, involved teachers in monthly sessions of 45 minutes (at the Denver site) or 2 to 3 hours (at the St. Louis site), plus classroom visits by a Consortium staff member. After what the Consortium staff member called the "very experimental" first year of Action Research, a participating teacher captured this ambivalence in her comment:

> It was far better than I hoped. I got a lot out of it and the kids really improved. I also feel it helped with my instruction, but I have a long way to go.

Some teachers gave specific examples of how they changed their practices. Making greater use of manipulatives and focusing more on problem-solving strategies to help students with story problems in mathematics were two examples that came up. However, the overall structure of teachers' lessons did not change dramatically, according to Consortium staff and the evaluators' on-site review of a small number of lesson plans.

Similarly, when evaluators observed an event at a Customized Training site, the effects on classroom practice seemed certain to fall short of expectations because it was clear that many participants absorbed only part of the content. In an exercise that was designed to teach aligning instruction and assessment, most teachers focused on the practical aspects of instruction instead. On the other hand, because this was an especially ambitious change effort, one could reasonably assess it against the high standard of transforming instruction. Participants, in general, were pleased with the intensity and the results of Customized Training and offered evidence to support their praise. For example, a principal whose

teachers participated in Customized Training at another site commented that their teaching practices changed after they had attended the professional development program:

> We have more use of manipulatives and hands-on. We have a science lab, and I've seen the use increase this year and a move to actual experimentation rather than just demonstration. More teachers are asking their students to write about math solutions—why rather than how.

The law also directed the Consortia to create ripples of communication and learning within the regions. Seventy-five percent of all the participants of Consortia professional development events surveyed said they had shared something they learned with one or more colleagues. Participants varied little in this response across activities, but a slightly higher proportion (89 percent) was found among those participants who were looking for help with a planned organizational improvement.

Evaluators also gathered information on the extent to which a Consortium activity stimulated and supported further training in the region. As of late spring 1996, the Consortium at AEL tracked its effects most systematically. According to its annual report, the 350 participants in that year's Regional Training had (as of the end of April) conducted 137 workshops, with another 64 scheduled through September. This was an average of just over one workshop conducted or scheduled, as of that early date, for every two original participants. Similarly, the SERVE Consortium obtained a commitment from TAAMSS participants to provide at least two workshops by the end of the summer. The Consortium planned to document participants' compliance with this commitment. Of the two participants interviewed for this evaluation, one had met the commitment in June and one expected to do so during the summer. An interviewee commented:

> I made a commitment to be part of education reform and science reform, so I will go beyond what SERVE asked me to do, to help whoever needs it. If I can't do it, I'll look to TAAMSS to find someone who can.

Compared with the reported effects of Consortia professional development activities on individual behavior or interpersonal communication, the reported effects of these activities on organizations—schools, school districts, and other agencies in which participants work—were somewhat more modest. Survey respondents reported that the most prevalent effect on organizations was the most low-key effect: the professional development activity "helped generate awareness of new information within the organization." Across the board, 69 percent of respondents said the effect in this regard was either moderate (42 percent) or major (27 percent). There was not much variation by activity. The most striking effect that these activities could have had at the organizational level would have been that they "helped the

organization initiate a new program, policy, or practice." Overall, participants split almost evenly among the four possible responses to this statement: 23 percent reported a major effect of this kind, 25 percent moderate, 26 percent small, and 26 percent no effect.

The organizations that received grants under SCIMAST's Professional Development Awards program were an exception to the general pattern of Consortia professional development activities producing moderate organizational effects. The effects in these organizations were unusually large. Having benefited from both the Professional Development Award and the Training of Trainers event, 65 percent of survey respondents in Training of Trainers reported that their Consortium activities had major effects on helping initiate a new program, policy, or practice.

It thus appears that there was a real payoff from SCIMAST's care in screening applicants and selecting only those with a demonstrated commitment to change. For example, applicants had to show that the majority of teachers at each school were involved and that administrators joined teachers in planning and training activities. Several participants commented on the rigor of the screening process for applications. Consortium staff were concerned, however, about the shortage of applicants with the organizational capacity to tackle an ambitious program of instructional improvement. In 1995-96, only 9 strong applications were received for the 15 grant slots; 6 additional applicants received planning grants. In interviews conducted in the spring of 1997, Consortium staff reported a continuing decline in interest in this kind of professional development activity.

Some Consortia activities that directly served classrooms also affected the surrounding organization. Again, an example comes from SCIMAST, which provided Customized Training only after it had obtained the principal's commitment and promise to participate. A Consortium staff member observed:

> We've found it's very important to include the administrators. It's difficult for a teacher to run a noisy, investigative classroom when the principal thinks all classrooms should be quiet and students sitting in straight rows.

Similarly, WERC staff claimed success in developing leadership capacity in Arizona Journey Schools, thanks to the active involvement of principals as team members. A SERVE Consortium staff member working on Project Soar, which tries to effect change across the schools in feeder patterns, said flatly: "You can't get anything done without principal support. [In this case,] principals said they wanted this to happen."

Only one of these professional development activities set out to tackle the greater challenge of affecting not only organizations but also the relationship between schools and

communities. Here, the Consortium staff involved with Arizona Journey Schools reported less success. Although the teams were supposed to include community members, creating a meaningful role for parents and other people from the community turned out to be beyond the reach of even this ambitious, 2-year effort.

Consortia professional development activities varied in the attention they gave to the surrounding state policy system. Sometimes their alignment with policy was overtaken by events. This happened in Arizona, where WERC's leadership role in Arizona Journey Schools emerged after a drastic change in the state policy climate around educational reform. TAAMSS, on the other hand, engaged a fairly high proportion of people who administer state programs right from the start. It had a dual focus on instructional content and the change process; its format encouraged active networking; and program administrators called it a great success in delivering content in a format that served their purposes. Initially, state leadership gave another activity, Participant Support, offered by SMCNWS, more mixed reviews. This program, which supported professional development for teachers, was designed to serve needs directly expressed by teachers. State officials interviewed in the spring of 1996, however, said it was not closely enough aligned with state program priorities. However, a year later, most state officials were reportedly pleased with the program and its fit with state priorities.

Participants' self-reports do not provide the ultimate verdict on the effects of a professional development activity, of course. Some Consortia planned to gather and analyze data on long-term changes in classroom instruction associated with their most ambitious interventions. They are to be commended for this commitment to investigating their own effectiveness. Interviews with Consortia staff conducted for the evaluation and a review of Consortia annual reports suggest that much of this evaluation is still in the planning stage or, if under way, has not yet been completed or the results reported. Nevertheless, the kinds of data reported here—on perceived contributions of Consortia professional development activities to knowledge, skills, and behavior—provide a useful glimpse of the effects that can plausibly be attributed to these Consortia services.

Summary of Strengths and Weaknesses

Participants in Consortia professional development activities generally praised the quality of the offerings and the contributions they made to their skills, knowledge, and changes in behavior. Most participants surveyed (62 percent) said they were doing something differently as a result of the professional development they received. Fewer, but

still about half, said that their organizations were doing something different. Although participants came to the events for many different purposes, most of them found a good fit between what they sought and what they took away.

Responding to the law's charge to create ripple effects in mathematics and science education in their regions—to assist and train selected educators so as to have indirect effects on larger numbers—the Consortia adopted training-of-trainers strategies and served selected sites more intensively. The findings suggest that in choosing the training-of-trainers strategy, it is important for the Consortia to attend to three issues in choosing trainers to train: first, they should target participants who already are responsible for providing professional development as part of their job; second, if the Consortia are going to rely on people in other role groups, such as teachers, they should be sure to provide them with training in the specific skills of conducting professional development; and third, they should follow up to remind participants of their obligation to deliver training to others (and to measure the extent to which this is occurring). Data collection subsequent to the surveys did not examine the extent to which the participants actually provided training and technical assistance to others. This will be an important topic for future evaluations and reports from the Consortia on the performance indicators.

Participating teachers acknowledge that they still have far to go in changing their classroom instruction, suggesting that even more depth and persistence are likely to be necessary—and, as also noted in the earlier discussion of work in intensive sites, persistence may be a problem when participation fluctuates over time, as it does at some sites. Yet the depth of discussion and engagement created at local sites was clear from interviews with participants. Perhaps, over time, the study groups created in the Models Learning Network and Action Research will pay off in real changes in classroom practice.

Alternatively, it is possible that SCIMAST's strategy of very rigorously screening participating organizations and working only with those that showed an organizational commitment to improvement from the start is a necessary ingredient in intensive site work. The early, positive findings from Training of Trainers participants (who are also Professional Development Award recipients) and Customized Training participants showed the promise of this selective approach. Down the road, this Consortium also intended to measure the instructional change associated with these intensive interventions. As of the spring of 1996, the only real stumbling block that had emerged was the scarcity of organizations that were clearly ready to move forward in instructional improvement. The Consortium was trying to develop more capacity through planning grants.

Thus, the Consortia tended to achieve the most impressive results in professional development when they worked with individuals and, especially, with organizations that were poised to do something—to deliver services to others or to engage in organizational change. There must be a good fit between the activity's purpose and participants' professional responsibilities, and probably their existing capacities as well. In the continuing challenge to make the most of limited dollars, the Consortia should strive to form partnerships with participating educators who are in a strong position to follow up on their professional development.

IV. TEAMS AND NETWORKS: CONSORTIA LINKS TO THE FIELD

The statute reauthorizing the Regional Consortia Program directs the Consortia to work cooperatively with others in their regions who are trying to reform mathematics and science education. Specifically, it directs them to:

- Communicate, on a regular basis, with entities within the region who are delivering services to students and teachers of mathematics and science.
- Assist in the development and evaluation of state and regional plans and activities that hold promise of bringing about systemic reform in student performance in mathematics and science. [Sec. 13302 (11&12)]

As part of their efforts to establish and maintain these lines of communication, the Consortia convene state teams and networks of professionals from across their regions who are active in various capacities in mathematics and science education. According to Consortia staff, these teams and networks help connect the Consortia to their regions and guide some of their decisions about activities and resource allocations. In the spring of 1996, the primary purpose of the *state teams* was to advise the Consortia on opportunities and options for providing services in individual states. Some teams had initiated projects of their own in their states. The *networks* concentrated on substantive themes or tasks, such as the development of a new mathematics or science curriculum framework.

Consortium support was intended to advance work in these areas, usually across the service region. Participation on both teams and networks afforded members opportunities to connect with and learn from people who shared similar or complementary interests and concerns. Participation, particularly on the state teams, could also result in members' garnering resources for their own or other projects back home. Finally, as survey data indicate, members of teams and networks reported that these activities sometimes contribute to changes in how they do their work. Data collected in the spring of 1997 indicate that the teams and networks continue to serve the functions identified earlier.

Team and network members were based in colleges and universities, state education agencies, local school districts, and other organizations. Many were grantees of federally funded programs, such as NSF's SSI Projects and the Eisenhower State Curriculum Frameworks Projects. Many, if not all, state teams also included state Eisenhower program staff. In addition, at least some teams and networks included individuals from informal mathematics and science centers, such as museums and the national energy laboratories, and

from business and the community. Typically, membership on state teams was broader than that on networks, reflecting, at least in part, the different purposes of the two types of groups.

Supporting these teams and networks has become a significant part of most Consortia's portfolios of activities and service. Six Consortia convened and supported state teams, and four convened and supported at least one network as of spring 1996. Almost all of these groups were established during the first grant period, although they varied somewhat in their maturity and prominence in individual Consortia's portfolios of service. For example, the Mid-Atlantic Eisenhower Consortium for Mathematics and Science Education (Mid-Atlantic Consortium) organized its state teams early in the initial grant period, and continues to support them.

Supporting teams and networks also became a major activity of the new Consortium in the Northeast and Islands region. The Eisenhower Regional Alliance for Mathematics and Science Education Reform (Regional Alliance) continued to support the state teams and two regional networks (the Equity Steering Committee and the K-16 Steering Committee) originally organized by a different grantee. In addition, this Consortium has organized four new networks. One is the Alliance Schools Network, connecting schools from each of the nine jurisdictions in the Regional Alliance's service region. According to the Regional Alliance's 1997 annual report and recent interviews, the Alliance Schools Network has become a prominent part of the activities and services of the Regional Alliance. It has also become the primary vehicle for delivering this Consortium's intensive services to participating schools in the states and territories that it serves.

The second new network is the Curriculum, Instruction, and Assessment Network, which has the goal of supporting state and local efforts to implement curriculum frameworks. In its 1997 annual report, the Regional Alliance also discusses early efforts to convene an Informal Science Network. This is an outgrowth of the Consortium's efforts to identify informal science centers for an on-line database operated by the Consortia and the Eisenhower National Clearinghouse (ENC), an activity that is discussed in more detail in the chapter of this report on collaboration and networking among the Consortia. The fourth new network is the Public Engagement Network.

The state teams supported by three other Consortia—the Consortium at the Appalachian Education Laboratory (Consortium at AEL), the High Plains Consortium (HPC), and the SERVE Eisenhower Consortium for Mathematics and Science Education (SERVE Consortium)—developed later than the teams in the Mid-Atlantic and Northeast regions. For example, the SERVE Consortium convened its state teams but, as of spring 1996, they had met

only once. The Science and Mathematics Consortium for Northwest Schools (SMCNWS), the new Consortium in the Northwest, created state advisory groups, but their work was halted until October 1996. Subsequently, these groups resumed their activities and have taken an active role in advising the Consortium on policy issues related to its programmatic activities. The Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) established the Southwest SSI Network. This network continues to be the only one that the Consortium supports. Similarly, the Mathematics and Science Leadership Team was the only network supported by the Pacific Mathematics and Science Regional Consortium (Pacific Consortium). Staff of the WestEd Regional Consortium for Science and Mathematics (WERC) participated on the California Science Education Advisory committee, which was producing a science curriculum framework for the State Superintendent of Public Instruction.

The Sample of Teams and Networks Evaluated

The evaluation examined and surveyed a sample of participants from 9 of the 10 teams and 4 of the 5 networks. The teams included at least one team from each Consortium that supported teams and all the networks that the Consortia supported at the time. To guide the selection of sample teams, evaluators invited Consortia directors to nominate teams that they believed to be particularly active in the states. Data collection activities included interviews, document review, and surveys of team and network members. The sample of team and network participants who were surveyed included a total of 319 members. Exhibit 9 displays the teams and networks included in the survey sample, the numbers of members on the official rosters of these groups provided by the Consortia, the sample size, and the survey response rates. In addition to the teams and networks surveyed, the evaluators collected some information on the state team in the District of Columbia, which the Mid-Atlantic Consortium supports, and the Pacific Consortium's Pacific Regional Mathematics and Science Team.

Activities of the State Teams

From the perspective of the Consortia, the primary reason for convening and supporting state teams is to connect the Consortia to the field. The Consortia expected state teams to do this in several ways:

- Provide advice about state needs and opportunities for service by the Consortia.
- Make decisions about allocating resources available from the Consortia.
- Inform others about the work of the Consortia.
- Work on activities related to state reform initiatives.

In addition, the Consortia viewed their support of state teams as creating opportunities for people who otherwise might not come together to discuss issues of common concern and to learn from each other.

Exhibit 9

MATHEMATICS AND SCIENCE EDUCATION REGIONAL CONSORTIA PROGRAM PARTICIPANT SURVEY SAMPLE

Teams

Team	Consortium	Total Participants	Sample Size	Surveys Returned	Response Rate (%)
Tennessee Steering Committee	Consortium at AEL	38	38	28	74
Vermont Statewide Action Team	Regional Alliance	12	12	8	67
Maine Statewide Action Team		9	9	8	89
New Jersey State Team	Mid-Atlantic	124	58	35	60
Pennsylvania State Team		70	28	23	82
Florida State Team	SERVE	10	10	8	80
North Carolina State Team		9	9	7	78
Alabama State Team		10	10	5	50
North Dakota Math and Science Alliance	HPC	34	34	19	56
Total		316	208	141	68

Networks

Network	Consortium	Total Participants	Sample Size	Surveys Returned	Response Rate (%)
California Science Education Advisory Committee	WERC	32	32	23	72
K-16 Steering Committee	Regional Alliance	26	26	21	81
Equity Steering Committee		24	24	15	63
Southwest SSI Network	SCIMAST	29	29	21	72
Total		111	111	80	72

All the teams included in the second phase of the evaluation carried out all these functions, but there are differences in how they did so. Three examples illustrate some of the differences:

- Tennessee State Steering Committee. This state team, like the others organized by the Consortium at AEL, advised the Consortium director and staff on a number of activities that the Consortium intended to carry out in the region. Team members reviewed grant proposals for several Consortium-sponsored mini-grant programs and selected the projects to receive Consortium support in Tennessee. Team members also actively assisted in reframing the content of the Consortium's Regional Training Project (discussed in this report's chapter on professional development) to link it more explicitly to state mathematics and science reform efforts. Team members then helped the Consortium identify schools to receive intensive assistance. The steering committee also advised the Consortium on the content of the Regional Training Project. Like the other state steering committees, this one recommended that the content of the Regional Training Project address the state curriculum framework for mathematics and science education and that an earlier workshop package on national standards be revised.
- Pennsylvania State Team. With guidance and support from the Mid-Atlantic Consortium, this state team identified a set of priorities for contributing to mathematics and science education reform in the state. Guided by these priorities, the primary function of the team was to select activities that addressed these priorities to support with Consortium resources. Proposals for individual projects usually came from team members. According to the Consortium's 1997 annual report, this team set three priorities for its upcoming work: (1) supporting professional development by creating regional collaboratives; (2) disseminating a coherent message about reform to various stakeholders; and (3) promoting equity through professional development and dissemination of information about encouraging female and minority students in mathematics, science, and technology.
- North Dakota Math and Science Alliance. Working with Consortium staff, this state team assessed needs and identified priorities for activities that were consistent with the overall priorities of the Consortium. Using financial and other resources from HPC, it convened a number of statewide and regional meetings that focused on reforms in mathematics and science education and set priorities for state initiatives. A science focus group also evolved out of the activities of this team.

As the three examples illustrate both the availability of Consortium resources to support the teams themselves and the activities that the teams chose were key ingredients in the glue that held the teams together. Indeed, all the Consortia that supported state teams invited them either to make resource allocation decisions or to advise the Consortia on allocating resources. Three Consortia—HPC, SERVE, and the Regional Alliance—allocated equal amounts of Consortium funds to each of the teams in their regions to support team activities

or projects. The amounts ranged from $10,000 per team at SERVE and the Regional Alliance to $35,000 at HPC. The Mid-Atlantic Consortium allocated resources to the four teams in its region according to a formula based on enrollments.

Directors and staff of Consortia that supported state teams generally agreed that state teams were important "sources of intelligence about what's going on in the states" and that "they let us know about what the states need." "They are the central actors in defining needs, activities, and priorities of the Consortium." One director gave a more specific example of the kind of strategic information that might come from a state team:

> The main purpose of the teams is to keep us informed about major issues in each state—about changes in math and science or in the frameworks and assessments. For example, if team members say that they weren't very involved in the framework writing because it was a top-down effort, then we would know how to look at it [the framework] when we get to it.

The Consortia made every effort to keep state teams apprised of Consortia activities and services—according not only to interviews with Consortia directors and staff but also to a review of minutes and summaries of team meetings and the survey data. In most cases, team meetings convened by the Consortia included presentations and reviews of ongoing and new Consortium activities and services. In addition, interviews with Consortia staff and directors and members of the teams, as well as survey data, indicated that the Consortia actively followed up with team members. The Consortia fully expected team members to share their information with colleagues in their organizations or with constituent and stakeholder agencies and organizations. Through this process, the Consortia hoped that, as people in the regions became more aware of their activities and services, they would come to see the Consortia as valuable resources. As one Consortium director, who thought that the state team strategy had achieved its purpose quite effectively, explained:

> We expect them [state team members] to actively disseminate the information they get from us to their organizations, and it appears that they are doing that. In fact, this model has worked so well for us that we are replicating it in the comprehensive center.... Sometimes the [team members] serve as our best public relations people.

These communications on behalf of the Consortia also served another function, at least by implication. If team members successfully communicated messages about the resources that were available from the Consortia, they helped limit expectations and led clients and potential clients to make requests that were consistent with what the Consortia could do.

Activities of the Networks

The following brief profiles describe the activities of the networks prior to the administration of the customer survey in spring 1996:

- Equity Steering Committee (Regional Alliance). The purpose of this network, which includes state agency and local staff responsible for addressing equity issues in mathematics and science education reform, was to create a regional infrastructure. The Regional Alliance sponsored annual institutes that focused on specific topics (e.g., data use) related to solving local equity problems. The Consortium also provided resources for members to attend other training and professional development sessions. Network members advised the Consortium on other activities to support. Activities during 1996-97 continued to focus on data use in monitoring equity problems.
- K-16 Steering Committee (Regional Alliance). This network brought together K-16 staff and faculty and staff from institutions of higher education who were interested in K-16 collaboration as a strategy in systemic reform. Annual institutes, which were sponsored by the Regional Alliance, included opportunities for network members and other participants to visit partnerships of K-12 and higher education institutions. The primary activity of this network in 1996-97 was a regional conference on professional development schools.
- Southwest SSI Network (SCIMAST). Members included SSI directors and staff who met to explore issues of common concern related to state systemic reform. Meetings generally focused on single topics related to the work of all the SSI projects, such as assessment, curriculum frameworks, and standards. Directors made up the core group, and individual project staff participated in activities related to their specific responsibilities. The Consortium provided financial support for this network and assumed responsibility for organizing and facilitating network meetings.
- California Science Education Advisory Committee (CSEAC) at WERC. With the endorsement of the state superintendent of public instruction, this group of California science educators, which was convened with the California Alliance for Science and Math, the state's SSI project, worked on the development of standards for science education in the state's Challenge District Program. Consortium staff participated as members of the network and provided technical as well as financial support for this network. The Consortium's Web site was used to disseminate drafts of the standards and to collect comments.
- Pacific Regional Mathematics and Science Team (Pacific Consortium). Network members included mathematics and science supervisors from each of the 10 entities in the Pacific region. With financial and technical support and training from the Consortium, members of this network drafted mathematics and science standards for the Pacific region and worked on implementing them. Planning was under way for network activities and projects to be completed during the current grant period.

Networks differed in their clarity and specificity of purpose, and their activities reflected these differences. Two networks, the Southwest SSI Network and the CSEAC, had reasonably clear—albeit quite different—purposes. The purpose at the Southwest SSI Network was to support the ongoing implementation of SSI projects, whereas the CSEAC took on the challenging and politically charged task of writing science standards. The Regional Alliance assumed the ambitious but less well-defined tasks of working with the Equity and K-16 Steering Committees to define key issues in each of these areas and to organize activities that would help participants understand and address them.

Consortia support for network activities ranged from organizing routine meetings to supporting special projects. In addition, for four of the five networks, Consortia assumed a major leadership role in convening and facilitating meetings. In the case of the CSEAC, Consortium staff played a membership rather than a leadership role. Finally, like the state teams, the networks were all sources of ideas and advice about additional activities the Consortia could support. Interviews with Consortium staff suggested that the Equity Steering Committee, the K-16 Steering Committee, and the Pacific Regional Mathematics and Science Team played an especially valuable role in this regard.

State Policy Context of the Teams and Networks

State context, as defined by the presence or absence of ongoing reform initiatives in mathematics and science education and the status of the state department of education, appeared to exert a significant influence on the work of the state teams. In the spring of 1996, observations about the Consortia experiences in organizing and convening the state teams included in this evaluation led the evaluation team to conclude that it was easier to work with teams in places where there was less state-level action in mathematics and science education reform. For example, in reviewing the differences among the four states served by the Consortium at AEL and the progress made in working with the teams, the Consortium director observed:

> The Consortium is not the only game in town, particularly in Kentucky and Virginia. We are the only game in town in Tennessee. Therefore, it has been easier for us to work with the Tennessee Steering Committee, and this committee has made the most progress.... [In contrast] all of the changes in Virginia have made it harder for us to work there and even to know who we are to work with.

Similarly, staff at the Mid-Atlantic Consortium and HPC attributed the slow progress of the Pennsylvania State Team and the North Dakota Math and Science Alliance, respectively, to the relatively limited role that the two state departments of education played in

mathematics and science education. In Pennsylvania, there were no major mathematics and science education reform initiatives under way. As for North Dakota, a member of the North Dakota Math and Science Alliance said:

> HPC has been the main funding source for the Math/Science Alliance, and this funding has allowed our alliance to move from its beginnings as a small advisory group which nearly died [because of a reduction in the state department of education] to an action group which has greatly enlarged and is taking a leadership role in promoting mathematics and science in this state.

In states with major reform initiatives, teams and networks needed to link their work to these initiatives in some way. The experiences of the CSEAC and the New Jersey State Team represented contrasting examples of efforts to find a niche in existing state reform activities. The CSEAC's development of standards for science education was intended to contribute directly to the state's Challenge Schools initiative, and the state superintendent of instruction endorsed this activity. Consortium support helped make the work possible. In New Jersey, the state team was organized as part of the New Jersey SSI project. Staff at the Mid-Atlantic Consortium pointed out that since elements of the state's mathematics and science reform were organized under the New Jersey SSI project, which was based at Rutgers University, it did not make sense to create a separate entity or one that was not closely linked to the SSI. A member of the team explained the reasons for what he saw as the team's lack of impact:

> In New Jersey, the state team has no role other than to figure out how to spend the funds allocated by the Mid-Atlantic Consortium. As a team, it's not very proactive...it doesn't have a role for two reasons. First, we have an SSI here. That should be taking into consideration all of the needs in math/science/technology education in the state.... In a sense, the SSI functions like a state team.... Second, we have a strong mathematics coalition...which functions like a state team in math issues. The Math Coalition did this prior to the SSI and serves as a model. So you have two strong organizations, each having a similar role, overlapping already themselves...the state team does not have a major effect.

The experiences of two Consortia, the Regional Alliance and the Consortium at AEL, suggested that major changes in state departments of education seriously hindered the work of state teams, at least in the short term. Changes in Virginia's state department of education, including a change in leadership and a highly charged statewide debate over standards, made it difficult for the Consortium to even know whom they should contact. Similarly, the co-directors at the Regional Alliance argued that the size and complexity of the New York State Department of Education, combined with recent changes in leadership and structure, made it difficult for the Consortium to organize a team in that state or even to find opportunities for

service. One co-director also noted that "recent downsizing of state departments [in the Northeast] has caused a lot of stress, and people are very worried about their future. It's difficult for us to get teams to focus for these reasons." Subsequently, the Regional Alliance's 1997 annual report indicates that the Consortium has made progress in reshaping a plan for a state team in New York.

Participants and Participation in Teams and Networks

Members of teams and networks reflected a range of experience and perspectives on mathematics and science education and education reform. Surveys provided information about three characteristics of these individuals that were likely to influence the internal dynamics of teams and networks, as well as the benefits that were likely to accrue to the participants and to the Consortia: where the members worked, their job responsibilities, and their reasons for participating on a team or network.

Composition of the Teams and Networks

Typically, individuals were invited to join teams and networks because they were in key positions and were expected to know about and to have an interest in the work of the Consortia. This strategy was consistent with the Consortia's primary purpose in supporting the teams and, to a lesser degree, the purpose of the networks, which was to advise the Consortia on activities and investments. One Consortium director explained how his Consortium convened the state teams in its region:

> We started with the categories of people in the legislation. We got representatives from each group. To start, we wanted the key stakeholders, such as the state Eisenhower people, K-12 people, postsecondary coordinators, state supervisors of math and science, key representatives of professional associations, key business people, and district-level math and science people. The teams are intended to be inclusive.... We have an ad for members in our brochure and in [the Consortium's newsletter]. People can fill out an interest form and become members.

Just under a third of the team and network members who responded to the survey reported that they worked in institutions of higher education (Exhibit 10). About 28 percent of the respondents worked in schools or school districts, and about 11 percent worked in state education agencies. A substantial number also reported working in some other kind of organization. This general pattern held for both teams and networks.

Exhibit 10

MEMBERSHIP ON TEAMS AND NETWORKS, BY LOCATION OF EMPLOYMENT (In Percentages)

Employment Location	All Participants	Teams	Networks
School	11	14	3
School district	17	17	17
Intermediate education agency	6	6	3
State education agency	11	10	15
Institution of higher education	31	34	25
Other	24	19	37

Exhibit reads: Eleven percent of the members of teams and networks who responded to the survey reported that they were employed in a school.

Source: Customer survey.

When asked about their job responsibilities, 73 percent of the members of teams and networks reported that professional development was a main part of their responsibilities (Exhibit 11). Overall, teams included more staff from schools and more elementary and secondary school teachers than did networks.

The survey data indicate that the Consortia achieved broad-based membership for the teams and networks. At the same time, most members of teams and networks were not formal representatives of the organizations in which they worked or to which they belonged. This absence of formal ties could weaken the Consortia's connections to the field. The selection and formal charge to members of the state teams in the Consortium at AEL's region are an example of a strategy to overcome this problem. The Consortium director reported that "all members of the steering committee are designated and recognized as representing their respective organizations and associations." Thus, the chief state school officers were involved in selecting state agency staff to serve on the state team. For representation from state professional associations (e.g., the state mathematics or science teachers association), the Consortium invited the president, or a designee, to join the team. The Consortium director thought that this process "creates stronger links to these organizations."

Exhibit 11

MAJOR PROFESSIONAL RESPONSIBILITIES OF THE MEMBERS OF TEAMS AND NETWORKS (In Percentages)

Responsibility	All Participants	Teams	Networks
K-12 teaching	18	22	8
Postsecondary teaching	26	28	20
Administering local education program(s) or organizations	26	26	28
Administering state education program(s) or organizations	25	23	29
Providing professional development or technical assistance	73	69	82
Other	16	18	15

Note: Columns may not sum to 100 percent because multiple responses were possible.

Exhibit reads: Eighteen percent of the members of teams and networks who responded to the survey reported that they were teaching in grades K-12.

Source: Customer survey.

Reasons for Participating on a Team or Network

Overall, teams and network members who responded to the surveys had similar purposes for participating (Exhibit 12). The most frequently mentioned reason was "being a resource to others"; 77 percent of the respondents listed this reason. Just under two-thirds of all participants reported that they were seeking to keep current professionally or that they were looking for ideas or contacts that would strengthen their own work or strengthen the work of their organization. Fifty-three percent were looking for ideas and contacts to help with a planned change effort.

Reasons for participating on teams and networks differed among role groups. When compared with state agency staff and faculty and staff from institutions of higher education, school and school district personnel more often said that keeping current professionally and gaining ideas and contacts to improve their own work were reasons for joining one of these groups. On the other hand, state agency staff and higher education faculty and staff mentioned serving as a resource to others more often than did school and district personnel. Overall, the survey data suggest that local personnel were more often motivated by individual interests and concerns to participate on teams and networks.

Exhibit 12

MEMBERS' PURPOSES FOR PARTICIPATING IN TEAMS AND NETWORKS (In Percentages)

Purpose for Participation	All Participants	Location of Employment					
		School	School District	Intermediate Education Agency	State Department of Education	Institution of Higher Education	Other
Keeping current professionally	63	69	75	72	57	58	62
Obtaining ideas or contacts that would strengthen my work	67	74	70	72	64	60	73
Obtaining ideas or contacts that would strengthen my organization's existing work	66	50	55	80	84	72	62
Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort	53	43	61	64	60	55	44
Being a resource to others	77	64	66	80	76	91	5

Note: Columns may not sum to 100 percent because multiple responses were possible.

Exhibit reads: Sixty-three percent of members of teams and networks who were employed in schools reported that one reason for participating was to keep current professionally.

Source: Customer survey.

One member of a state team very succinctly stated a reason for participating on a state team: "I expected that being on [the state team] would affect my organization, that we would get some funds for the projects we do." The prospect of obtaining resources from their Consortium motivated others to serve on teams and networks as well, according to interviews with members and some Consortia staff. Because one of the functions of the state teams and some of the networks was to decide how Consortium resources were allocated and there was a possibility that at least some of those resources might support activities for which group members had responsibility, it was not surprising that they would be interested and willing to serve.

Level of Involvement

Among all the survey respondents who reported belonging to a team or network, 55 percent described their participation as "interested and involved" (Exhibit 13). Slightly fewer than a fifth, 18 percent, said that they were "critical" to the work of the team or network. At the other end of the spectrum, 17 percent indicated that they were "available if they need me," and 11 percent said that they were "uninvolved."

Exhibit 13

LEVELS OF INVOLVEMENT OF MEMBERS OF TEAMS AND NETWORKS (In Percentages)

Self-Reported Level of Involvement	All Partici-pants	Location of Employment					
		School	School District	Intermediate Education Agency	State Department of Education	Institution of Higher Education	Other
Critical to the activity's success	18	8	22	0	12	17	25
Interested and involved	55	51	31	52	56	64	61
Available if needed	17	30	24	8	20	15	9
Uninvolved	11	12	24	40	12	4	5

Note: Columns may not sum to 100 percent because of rounding.

Exhibit reads: Eighteen percent of the members of teams and networks reported that they were critical to the activity's success.

Source: Customer survey.

Role groups varied in their levels of involvement in teams and networks. Eighty-one percent of higher education faculty and staff and 68 percent of state education agency staff said that they were either interested and involved in a team or network or critical to its success. Conversely, 59 percent of school staff and 53 percent of school district staff said that they were interested and involved or critical to the success of a team or network.

Members of state teams were somewhat less likely than network participants to report being interested and involved or being critical to the teams' success (69 percent versus 78 percent). Seventy-five percent or more of the members of six teams and three networks reported that they were either interested and involved or critical to the teams' success. In contrast, a third or more of the members of three state teams—Florida, New Jersey, and Pennsylvania—said that they were either available if needed or uninvolved. (Eighteen

individuals identified as members of the New Jersey state team to whom we sent surveys reported that they either were not on the team or were unsure whether they were.)

Challenges Posed by Diverse Participants and State Context

Supporting teams and networks placed Consortia in relatively long-term relationships with the groups and individual members. These relationships represented substantial investments for the Consortia, both in the funds they provided for team and network activities and in the staff time and energy they devoted to convening and facilitating these groups. The similarities and differences in the professional experience and perspectives of the individual participants, combined with the influence of state policy context, posed some real challenges to the Consortia. They had to somehow find ways to bring all these people together to have productive conversations and to work on common tasks. They also had to find ways of working within vastly different state contexts. In general, these challenges were greater among the state teams and greater for some teams than others. Finally, the fact that more faculty and staff from institutions of higher education and from state departments of education than local educators reported being more involved and active than local educators raises the possibility that local voices were less often heard.

Consortium directors and staff who worked with the teams and networks were aware of these challenges. One, who said that he was both surprised and frustrated by first contacts with state teams, offered the following description of his Consortium's early struggles:

> Everybody had an agenda. It took me a year and a half to get everyone to look at the big picture and to come to a common vision. When we first came into the picture, everyone thought that we were a source of money and that's what everyone wanted from us. Now all of the [state teams] are pretty much moving forward in the same direction.

A staff member at the Mid-Atlantic Consortium added:

> It's difficult to get different people to agree on common goals. Working with and through a lot of different people means that it is time-consuming to develop genuinely collaborative relationships. The different teams have different successes and failures. Our frustration is how to get their work coordinated in a focused way.... The closest the teams have come is through the support of professional development. [Professional development] has gotten people around the table to think of the big picture.

Impact and Outcomes of the Teams and Networks

Members of the teams and networks reported that their activities created new opportunities for communication to occur and laid the groundwork for new working

relationships. Members also reported that their participation affected their knowledge and skills and how they did their work, although these effects appeared to be fairly modest for most participants. At the same time, it appeared that participants from institutions of higher education and state departments of education derived more from their participation than did either school staff or school district personnel.

Effects on Individual Behavior and Skills

Participants in the survey sample reported that being on teams and networks had a variety of effects on their work. Almost three-quarters of them said that they had shared ideas from these activities with their colleagues. In addition, just under 60 percent said that these groups confirmed things that they were already doing. At the same time, 54 percent also reported that they had incorporated something new in their work. More than half of the members of six teams, but only one member of the networks, reported incorporating something new in their work as a result of participating in these groups.

Members gave mixed ratings to the contributions of teams and networks to their knowledge and skills in (1) mathematics/science/technology education, (2) professional development, (3) assessment/standard setting, (4) planning, and (5) collaboration and communication. These ratings appear to be consistent with their overall assessment of how well the teams or networks served their purposes. Contributions in the area of collaboration and communication received the highest rating, with 44 percent saying they were major and 32 percent saying they were moderate. Ratings in the other four categories tended to cluster in the moderate and small range, although between 15 percent and 22 percent rated the contributions in these areas as major.

Participants also reported some effects of the teams and networks on their organizations. Forty-five percent said that the addition of new knowledge was a moderate effect and 40 percent that confirming what their organizations were already doing was a moderate effect. Team members were more likely to report these effects than were members of networks, who more often saw these as small effects. Just over a fourth of the members of the teams and networks saw the teams and networks as having moderate effects on initiating something new in their organizations, and more than half said that the groups had no effect on efforts to do something.

Extent to Which Teams and Networks Served Participants' Purposes

Overall, 58 percent of the participants said that the team or network was a good start toward serving their purposes in participating, and 28 percent said that their purposes were

completely served. Ten percent said that the team or network was a start but that it did not provide sufficient information or guidance for follow-up. At least 70 percent of the members of all the teams and networks reported either that their purposes were completely served or that the team or network represented a good start (Exhibit 14).

Exhibit 14

MEMBERS' REPORTS ON THE EXTENT TO WHICH TEAMS AND NETWORKS SERVED THEIR PURPOSES (In Percentages)

Extent to Which Teams/Networks Served Members' Purposes	All Participants	Location of Employment					
		School	School District	Intermediate Education Agency	State Department of Education	Institution of Higher Education	Other
Purposes completely served	28	35	11	55	20	32	32
Good start	58	35	77	46	65	56	59
A start, but not sufficient information or guidance for follow-up	10	8	10	0	16	9	7
Did not serve purposes	4	22	3	0	0	3	2

Note: Columns may not sum to 100 percent because of rounding.

Exhibit reads: Twenty-eight percent of the members of teams and networks reported that their purposes in participating were completely served.

Source: Customer survey.

Among the four role groups discussed above, faculty and staff from institutions of higher education reported that the team or network was either a good start (56 percent) or served their purposes completely (32 percent). More local school district staff (77 percent) and staff from state education agencies (65 percent) reported that the team or network was a good start, but only 11 percent of the former and 20 percent of the latter reported that their purposes were completely served. Thirty-five percent of school staff said that their purposes were fully served, although 30 percent said either that their purposes were not served (22 percent) or that the team or network was a start but did not provide sufficient information or guidance for follow-up (8 percent).

Outcomes of the Work of Teams and Networks

Activities sponsored or carried out by state teams tended to fall into two categories: conducting or supporting meetings on issues related to mathematics and science education reform, and carrying out short-term workshop or training activities. Often, Consortia resources represented only a portion of the resources necessary for the activities, but they leveraged other resources. Compared with Consortia support for state teams, Consortia support for networks represented longer-term and more focused engagement on a particular task or in a particular area. Thus, the early work of the Pacific Mathematics and Science Team resulted in the development of mathematics and science standards for the entities in the Pacific region. Similarly, there was the possibility that the ongoing work of the CSEAC would produce new science education standards for California. The Southwest SSI Network provided ongoing support to SSI project staff and facilitated sharing among the projects. Finally, support for the Equity Steering Committee and the K-16 Steering Committee represented ongoing efforts to define issues in these two areas of mathematics and science reform.

When asked to identify significant outcomes of the work of the teams and networks, 89 percent of the members mentioned opening important new lines of communication. Slightly fewer, 77 percent, agreed that these groups provided unique forums for discussing important issues and created productive new working relationships. Seventy-seven percent also identified support for worthwhile projects related to reforms in mathematics and science education as a significant contribution. Members of the teams and the networks differed considerably in their assessments of this contribution. Eighty-five percent of the team members said that this was an important contribution, perhaps because their projects back home were among those that received support. In contrast, only 58 percent of the network members saw support of worthwhile projects as an important contribution.

Despite members' reports that significant outcomes of the teams and networks included support of worthwhile reform-related projects, there has been little systematic review of the quality and impact of the projects supported by the teams and networks. For example, the director of a Consortium in which state teams sponsor professional development said simply: "We have not followed up on whether they have implemented the training." Another director said: "We know what they do, but we don't know very much at all about whether any of it is any good."

Participant Ratings of Consortia Support for State Teams and Regional Networks

This section discusses participants' ratings of the support that the Consortia provided to teams and networks. Members of all but two of these groups gave the Consortia solid marks for their support. Overall, approximately 60 percent of team and network members said that the Consortia's paying for the groups' activities, convening and facilitating their meetings, and contributing staff time to organizing the teams and networks had major effects on these groups. Providing financial and other support for participants and providing substantive advice and guidance were rated as having major effects by 45 percent and 42 percent of all of the participants, respectively. Producing or disseminating a team or network product was rated as a major effect by 34 percent of the participants. The fact that the teams and networks are not, for the most part, involved in product development explains this last finding.

Members of the teams and networks valued different kinds of support. For example, 73 percent of the members of the networks rated facilitation of the networks as having a major effect, whereas only 53 percent of the members of the teams rated this contribution as having a major effect. Among all the networks, this kind of support was most often rated as having a major effect. Members of state teams were more likely to rate Consortia financial support for team activities as a major contribution. Indeed, members of all but one state team most often cited financial support for team activities as having a major effect.

Finally, members of state teams were more likely to see the Consortia's substantive advice and guidance as having a major impact than were members of the networks (46 percent versus 32 percent). This finding may be explained by the fact that the membership of state teams was more diverse than that of the networks, so that additional external guidance and direction were required to pull the groups together. The more clearly defined substantive focus and tasks of the networks may also mean that, once they were organized, they required less external guidance and direction.

Another dimension of Consortium support for teams and networks was follow-up. Survey data indicate that the Consortia were very aggressive in several kinds of follow-up. For example, 82 percent of all team and network members said that the Consortia had sent them materials more than once. Seventy-five percent said that follow-up had included more than one workshop, training, or meeting, and 72 percent said that it had included more than one telephone call. Fifty-five percent said that follow-up included providing financial support more than once.

Survey findings about the leadership of the teams and networks were mixed. Overall, 51 percent of the participants said that leadership was equally balanced between the participants and Consortia staff. At the same time, 20 percent said that it came from Consortia staff, and 18 percent said that it came from the participants. Participants on four teams and all the networks were most likely to see leadership as a shared responsibility. Participants on two state teams, those in Maine and Vermont, saw the teams themselves as exerting leadership. Participants on the Alabama state team saw Consortium staff as exerting leadership. Overall, the findings about team and network leadership suggest that there was some sharing of responsibility for this function and that participants were assuming ownership of the groups.

Overall, the evaluation data on participants' ratings of Consortia support for teams and networks suggest that these groups looked to the Consortia for financial support and for support in arranging and facilitating group activities, presumably including follow-up with materials and communication. They were somewhat less likely to look to the Consortia for leadership and substantive advice and guidance, although for some members of teams and networks, and for the teams and networks as groups, these were not unimportant contributions.

Strengths and Weaknesses of Consortia Support for Teams and Networks

Members of teams and networks valued participation in these groups for opportunities to open lines of communication with people whom they otherwise might not have met, to discuss important issues, and to forge new working relationships within their states and across regions. A large majority also said that these activities were closely related to broader reform efforts. Significant numbers of the participants, particularly those on the state teams, said that these groups supported important contributions to reform in mathematics and science education. Somewhat fewer said that their participation influenced their own work or that of their organization in some way.

The findings about members' involvement in teams and networks suggest that individuals from the local level—schools and school districts—were somewhat less involved in these groups than individuals from institutions of higher education and state departments of education. There are a number of possible explanations for this pattern, including the difficulties that local staff may face in getting away from work and traveling to a meeting. Strategies such as the recent reconfiguration of the Pennsylvania state team into seven

smaller regional entities are promising examples of efforts to make these groups more accessible to members and to ensure that all of their voices are heard.

The presence or absence of state reform initiatives and the degree of stability in state departments of education defined a Consortium's structure for working with and through a state team. In states where there were limited mathematics and science education reform initiatives, Consortium support could at least partially fill a void, and the state team could become a catalyst for reform. The North Dakota Math and Science Alliance and the Pacific Regional Mathematics and Science Team are examples of how this process worked. In states where there were more ambitious reform efforts, the Consortia and the teams had to find a niche and were more likely to devote considerable time and energy to negotiating a productive role. Finally, transitions in the leadership and organization of state departments of education could mean that decisions about team membership and team activities had to be put on hold until new players were in place and new agency priorities had been set.

Are the interests of the Consortia well served by their support of the teams and networks? The evaluation findings indicate that these activities did help define the Consortia as conveners and facilitators of potentially important dialogues, as catalysts for new working relationships, and as providers of financial resources. Team and network members viewed them as sources of leadership and guidance somewhat less often. Working with and through the teams and networks appeared to connect the Consortia to the field. The Consortia still faced the challenge of ensuring that these connections were strong and that they reflected good strategic choices for the use of Consortia resources in facilitating, supporting, and assessing the work of the teams and networks. In addition to looking at the contributions to mathematics and science education reform achieved through support for the teams and networks, the evaluators also inquired about the extent to which sponsoring these groups served the interests of the Consortia beyond meeting the objective of supporting reform.

V. PROMISING PRACTICES

The Consortia's authorizing legislation charges them with "disseminating exemplary mathematics and science education instructional materials" [Sec. 13301(a)(1)]. Therefore, conducting initiatives related to exemplary or promising practices is a logical extension of their purpose. The identification and dissemination of instructional materials, teaching methods, or assessment tools that are somehow determined to be of high quality fell within the legislative charge, as did providing technical assistance to sites that were implementing the promising practices.

The identification and dissemination of promising practices was a comparatively low-profile activity for the Consortia during 1995-96. Consortia annual reports for 1996-97 indicate that some Consortia are expanding their efforts in both print and electronic media, although these still do not appear to represent a major investment for them. The evaluators examined this topic during the spring of 1996 in part because the Office of Educational Research and Improvement (OERI) was launching a new approach to identifying promising practices but had not yet developed a plan for disseminating the practices.[2] Because evaluation data documenting the Consortia's experiences in this area could help inform emerging policy and programs, the focus of this section of the report is on the lessons the Consortia learned about the process and payoff of identifying and disseminating promising practices. Accordingly, this chapter analyzes the "market" for promising practices by analyzing recipients' responses to a book of promising practices in mathematics and science education.

Activity Evaluated

As part of their effort to respond to the charge to disseminate mathematics and science education instructional materials, the Consortia jointly developed *Promising Practices in Mathematics and Science Education* and published it in 1995. This book provided 50 two-page descriptions of programs and practices (along with shorter summaries of another 67 programs identified in an earlier, related effort by the regional educational laboratories). This was the only recent work on promising practices that was reasonably uniform across several Consortia and for which recipients could be systematically surveyed for this evaluation. (Much of the Consortia's activities with

[2] Subsequently, in the summer of 1997, OERI's Mathematics and Science Education Expert Panel completed a set of standards and guidelines for identifying promising and exemplary practices. According to OERI staff, two Consortia, WERC and the Mid-Atlantic Consortium, were assisting in pilot testing the standards and guidelines.

promising practices involves electronic dissemination—but, as discussed elsewhere in this report, the actual recipients of electronic communication are hard to track with current technology.) By the spring of 1997, the Consortia had updated much of the original material in the book and, in collaboration with the Eisenhower National Clearinghouse (ENC), put it into an electronic database.

The publication of this book was the culmination of a nationwide search and screening of promising practices. Some Consortia vigorously pursued practices that would be suitable for dissemination. They publicized the effort extensively and worked hard to arrive at operational criteria reflecting innovativeness, support of national standards, effectiveness, and transferability. They also coped with local sites' reluctance to cooperate in a labor-intensive identification process. A Consortium staff member describes the shortcomings of the process that ultimately resulted, as well the division of labor:

> Our stuff was not validated. When we went to the schools, [school staff] said that they couldn't or wouldn't fill out the forms.... We needed people to fill out the forms, but they wouldn't do it. There was no incentive.... Later, we agreed to streamline the form. We reduced it to 15 pages. Then we decided that the Consortium could fill out the form.

Beginning in October 1995, several Consortia disseminated the book. The history of this effort mirrors in important ways the policy that seemed to be emerging from OERI in the area of promising practices, that is, (1) the process of identifying the book's contents was very elaborate and labor intensive, and (2) dissemination reflected a low-level investment and a passive approach, consisting, in this case, of mailings rather than in-person communication or assistance.

The Survey Sample and Recipients of the Book

Five Consortia that disseminated copies of the volume made mailing lists that they could retrieve and make available to the evaluators. The 10 Consortia also disseminated thousands of copies but did not retain records of the recipients. The mailing lists contained the names and addresses of 1,444 recipients. Findings from our survey of recipients from these lists should be interpreted with caution because we do not know how representative they are of the total population of book recipients. Moreover, more than 50 percent of our final sample comes from one Consortium. See Exhibit 15 for details on the survey sample.[3]

[3] The Midwest Consortium for Mathematics and Science Education (Midwest Consortium) had records of two quite different mailings, one to people who were themselves potential disseminators of the book and one to the Consortium's much larger, general-purpose regional mailing list.

Exhibit 15

RECIPIENT SURVEY SAMPLE: DISSEMINATION OF PROMISING PRACTICES IN MATHEMATICS AND SCIENCE EDUCATION—1995

Consortium	Total Recipients	Sample Size	Surveys Returned	Response Rate (%)
Consortium at AEL	77	77	51	66
Mid-Atlantic	34	34	17	50
SCIMAST	56	56	32	57
Midwest	37 1,226	37 245	21 133	57 54
HPC	14	14	7	50
Total	1,444	463	261	56

According to the Consortia, survey respondents were individuals who either requested the volume or, more commonly, received it because their names were on a mailing list. The Consortia did not conduct any personal follow-up to underscore the book's message (and they had not been charged with doing so). However, recipients who were already part of the Consortia's work, such as the members of state teams in the region of the Consortium at AEL, continued their contact with the Consortia.

Most individuals among the 56 percent who responded to the survey were teachers and/or providers of professional development or technical assistance (Exhibit 16); 43 percent of respondents fell into each of these categories. Local administrators were also well represented, at 28 percent. Thus, the book had reached local educators.

Exhibit 16

PROFESSIONAL RESPONSIBILITIES OF INDIVIDUALS ON MAILING LISTS

Responsibility	Percentage of Respondents
K-12 teaching	43
Postsecondary teaching	12
Administering of local education program(s) or organization(s)	28
Administering of state education program(s) or organization(s)	13
Professional development or technical assistance	43
Other	7

Note: Column does not sum to 100 percent because multiple responses were possible.

Exhibit reads: Forty-three percent of the individuals who responded to the survey reported that they taught at the K-12 level.

Source: Customer survey.

The Consortia acknowledged that disseminating a book to a mailing list was a low-intensity activity from the recipients' perspective. Not everyone who was surveyed remembered receiving it. Of those who responded to the survey, 62 percent remembered receiving the volume. It is likely that many of those who did not respond—and nonrespondents were especially numerous for this activity—did not recall receiving it, but, of course, the evaluators had no firsthand information to confirm this suspicion. Of the nearly two-thirds of respondents who did say they received the book, half said they had read the entire volume or most of it; half had read less than half, very little, or nothing.

When asked about their purposes in looking at the book, recipients (defined here as those who remembered receiving it) tended to report either a personal or interpersonal purpose (Exhibit 17). About three-fourths said their purpose was "generally keeping current professionally"; about two-thirds expected to strengthen their own work; the same proportion intended to use it in helping others. Somewhat fewer expected their reading of the book to have organizational effects.

The survey also revealed that the people on these mailing lists tended to be in closer touch with their Consortia than most educators in their regions. For example, 34 percent had received telephone calls from their Consortia, and 23 percent reported that they had attended workshops, training sessions, or meetings sponsored by their Consortia—clearly a higher proportion than would be found among educators generally. Thus, the responses reported here are probably somewhat more favorable than would be obtained if the book were a completely stand-alone intervention. For a number of respondents, the book was part of a larger series of interventions.

Exhibit 17

RECIPIENTS' PURPOSES IN LOOKING AT THE BOOK

Purpose	Percentage of Recipients
Keeping current professionally	74
Obtaining ideas or contacts that would strengthen my work	66
Obtaining ideas or contacts that would strengthen my organization's existing work	53
Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort	39
Being a resource to others	66

Note: Column does not sum to 100 percent because multiple responses were possible.

Exhibit reads: Seventy-four percent of the recipients of the book reported that one purpose in looking at it was to keep current professionally.

Source: Customer survey.

Recipients' Ratings of Product Quality and Utility

Recipients rated the quality of the book as high on several dimensions (Exhibit 18). Ratings for accuracy and presentation were especially high, with about two-thirds calling it "good" in these respects and about one-fourth calling it "excellent." Ratings on completeness and depth were only slightly lower.

Exhibit 18

RECIPIENTS' RATINGS OF THE QUALITY OF THE BOOK

Rating	Percentage of Recipients			
	Accuracy of Content	Presentation	Completeness	Depth
Excellent	25	26	18	14
Good	67	62	62	66
Fair	8	12	21	18
Poor	0	1	0	2

The book did not appear to duplicate other available resources; a large majority of recipients (79 percent) judged it to be "unique." A smaller majority (58 percent) called it "closely related to broader reform efforts" in mathematics, science, and technology; 29 percent said it was "somewhat related" to such efforts; 13 percent responded "I don't know; I am not involved in broader reform efforts."

Effects on Recipients and Their Organizations

Effects on Skills and Knowledge

About three-fifths of survey respondents credited the book with making either a moderate or a major contribution to their skills and knowledge related to mathematics, science, or technology education (Exhibit 19). About half said it had made a moderate or major contribution to their skills and knowledge related to professional development. As would be expected for a resource book, respondents who called its contribution "moderate" far outnumbered those who called it "major." Its contributions in the areas of assessment or standard setting, planning, and collaboration or communication were reportedly smaller, with about one-fifth of respondents saying it had made no contribution to their skills and knowledge in these areas.

What Recipients Have Done as a Result of Reading the Book

Although many recipients considered the book a worthwhile resource for building their professional know-how, fewer said they were now doing something differently as a result of reading it. Fifteen percent of recipients agreed with the statement "I have incorporated something I learned from this activity into my job"; this is a far lower percentage than was found among participants in professional development, state teams, or networks who had responded to the same statement. Just 1 percent said the book had a major effect on their organization's initiation of a new program, policy, or practice, although 28 percent did attribute a moderate effect to the book in this regard.

Exhibit 19

RECIPIENTS' RATINGS OF THE BOOK'S CONTRIBUTION TO THEIR KNOWLEDGE AND SKILLS, BY DOMAIN (In Percentages)

Contribution	Math/Science/ Technology Education	Professional Development	Assessment/ Standard Setting	Planning	Collaboration/ Communication
Major	8	9	2	5	4
Moderate	53	40	38	40	40
Small	27	43	38	33	35
None	12	7	22	21	21

Note: Columns may not sum to 100 percent because of rounding.

Exhibit reads: Eight percent of the recipients of the book reported that the book made a major contribution to their knowledge and skills in math/science/technology education.

Source: Customer survey.

These responses were consistent with the observation of a Consortium director:

> I think that resources may be a barrier to using these practices. People read about them and then go to their principal to discuss trying them. The principal says that there is no money and that's the end of it.

Another measure of the book's effectiveness was the extent to which recipients either passed the information along or collected more information. Thirty-one percent shared some of the book's contents with a colleague. Even more—41 percent—contacted at least one of the sites whose practices were written up in the book. Of those who reported contacting sites, 59 percent said they received "a variety of useful information," although 18 percent found the information "not very useful," and 6 percent

found "there was little or no additional information available." In general, then, the book had a discernible effect in stimulating communication among educators.

Summary of Strengths and Weaknesses

The Consortia's expectations in producing and disseminating the book were entirely consistent with the findings reported here. They believed the book addressed people's interest in receiving information, but, in the absence of more resources to support implementation, they expected only a few recipients to take action on the ideas. A Consortium director and a staff member summarized the expectations in the following ways:

> The book gives general ideas about programmatic approaches recipients could take. It gives them contacts to make about a particular program. People who pick it up and read it have an interest in improving practices. The ideas they get, they may incorporate by virtue of having read the book and thought about it.... It's great materials and information and resources, but any kind of dissemination in broad-scale media has a low level of intensity for those who receive it. Some pick it up and it has no impact.
>
> [Its purpose is] providing easy-to-use information for teachers, professional developers, and others who are looking for new ideas. The guides would be resource books to help people who were looking for more material and teaching practices.

Given the Consortia's modest aspirations for the book, recipients reported a reasonably high level of satisfaction with the extent to which it served their purposes: 66 percent called it "a good start," and 16 percent said "it served my purposes completely."

One can assess the effectiveness of this work on promising practices from several perspectives: (1) the payoff from disseminating the volume, (2) this same payoff in relation to all the work on the volume, (3) OERI's policy choices in setting up a framework for grantees' or contractors' work in selecting and promoting the use of promising practices.

Viewed solely as a dissemination effort, the promising-practices volume can be considered a success. Once the book was compiled, disseminating it was a low-cost way of giving educators a high-quality resource. Recipients found the book reasonably useful for their purposes, although the purposes were most often limited to gathering information or simply staying up-to-date professionally.

However, the Consortia used considerable resources to identify candidate programs and practices, establish criteria for including them in the volume, review the candidate programs, and develop the volume. These were time-consuming procedures. Considering the opportunity cost of this work—the other ventures in professional development or technical assistance that were not launched—the evaluators have serious doubts about the cost-effectiveness of the overall effort. The survey data showed that most recipients used the book in a fairly casual way, browsing for ideas and perhaps finding some that they passed on to others or (more rarely) put into practice themselves. To the evaluators, there seemed to be a mismatch between the elaborate professional attention given to identifying practices and the informal, limited attention that readers gave to the resulting volume.

To inform policy decisions about future directions in the spread of promising practices, one can look at other avenues that OERI and its grantees or contractors could take. One choice would be to accompany an intensive process of selecting practices with equally intensive attention to the eventual use of the practices—to provide some technical or financial assistance for implementing them, for example. A Consortium director suggested this approach, criticizing the existing strategy of developing and disseminating materials:

> We don't have a lot of faith in that strategy. You are telling people, "Here's a practice that works in one place," but you're not giving them resources for implementation.

One solution to the problem of the need for follow-up that recognizes the limits of the Consortia's resources was found by the Consortium at SERVE. The Consortium conducted a professional development event—Celebrating Success, discussed earlier in the chapter on professional development—that focused on promising practices. The survey respondents who participated in that event reported considerably greater effects on their knowledge and work than did the readers of the book whose responses are reported in this chapter. Fifty-nine percent reported that they had incorporated something they learned into their work; 50 percent reported a moderate or major effect on a new organizational program or policy. These responses support the argument that a modest investment in follow-up makes for a much more effective intervention, and that the ultimate effects of Consortia efforts to produce products, such as the book on promising practices, will be modest and perhaps disappointing with such an investment.

VI. THE USE OF TECHNOLOGY BY THE CONSORTIA

The original authorizing legislation charges that the Consortia "...if feasible, maintain on-line computer networks with all Regional Consortiums and the National Clearinghouse for Science and Mathematics Education Materials...." According to the terms of their grants, each Consortium is also required to operate a demonstration site within its region featuring services offered by the Eisenhower National Clearinghouse (ENC). By the spring of 1996, the Consortia had gone beyond this mandate, using technology in many ways to further the goals of the program.

All Consortia established World Wide Web sites. These sites varied in complexity and sophistication, but they all described Consortia activities and disseminated resources. Consortia also encouraged educators to use technology by offering them technical assistance and professional development. In keeping with the grant award, each Consortium maintained an ENC demonstration site. Consortia also used Internet technology, through list servers, to promote communication and cooperation among various groups that are interested in the reform of mathematics and science education. By the spring of 1996, technology represented a fairly small part of the Consortia's portfolio of activities, but there was a clear trend toward increasing the integration and use of technology in every Consortium. By the spring of 1997, nearly all Consortia had expanded both their Web sites and their use of technology.

This section describes the ways in which the Consortia used technology, beginning with a discussion of the Consortia's Web sites. Next, it discusses Consortia efforts to promote educators' use of technology through professional development and technical assistance. Then it describes the Consortia's efforts to promote communication and networking among state teams, regional groups, and the Consortia network through technology. It concludes with a discussion of the strengths and weaknesses of the Consortia's use of technology.

Consortia on the World Wide Web

The Consortia and the ENC have a presence on the World Wide Web (see Exhibit 20). Using a "browser" (such as *Netscape Navigator*) and an appropriate Internet connection, an individual could locate the Web site of a Consortium. As an example, the Midwest Mathematics and Science Consortium (Midwest Consortium) home page was located by typing in the address "http://www.ncrel.org/msc/msc.htm" (see Exhibit 20).

The local computer retrieved the information that is displayed in Exhibit 21 from a computer, or server, located at the Midwest Consortium in Oak Brook, Illinois.

Exhibit 20

CONSORTIA ON THE WORLD WIDE WEB

Eisenhower Regional Math/Science Consortium at AEL	http://www.ael.org/eisen/
WestEd Eisenhower Regional Consortium for Science and Mathematics	http://www.wested.org/werc/
High Plains Consortium for Mathematics and Science at Mid-continent Regional Educational Laboratory (McREL)	http://www.mcrel.org/hpc/
Midwest Consortium for Mathematics and Science Education at North Central Regional Educational Laboratory (NCREL)	http://www.ncrel.org/msc/msc.htm
Eisenhower Regional Alliance for Mathematics and Science Education Reform at TERC	http://ra.terc.edu/alliance/HubHome.html
Science and Mathematics Consortium for Northwest Schools (SMCNWS) at Columbia Education Center	http://www.col-ed.org/smcnws/
Pacific Mathematics and Science Regional Consortium at Pacific Resources for Education and Learning (PREL)	http://prel-oahu-1.prel.hawaii.edu/math-science/index.html
Mid-Atlantic Eisenhower Consortium for Mathematics and Science Education at Research for Better Schools (RBS)	http://www.rbs.org/eisenhower/
Eisenhower Consortium for Mathematics and Science Education at SouthEastern Regional Vision for Education (SERVE)	http://www.serve.org/Eisenhower/
Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) at Southwest Educational Development Laboratory (SEDL)	http://www.sedl.org/sedl/scimast.html

This exhibit displays one of the primary features of the World Wide Web, the use of links, shown as underlined text. By using a mouse to click on School Improvement "Pathways," for example, a user would immediately move to the Pathways Web page (see Exhibit 22). On this Web page, there is much more that the reader could access. This includes information on "Parent and Family Involvement," "Assessment," "School to Work," "Math," "Science," etc., indicated by the underlined words at the bottom of the page. A click on any of these takes the user to yet another page with additional information on that topic and additional links to related information.

Exhibit 21

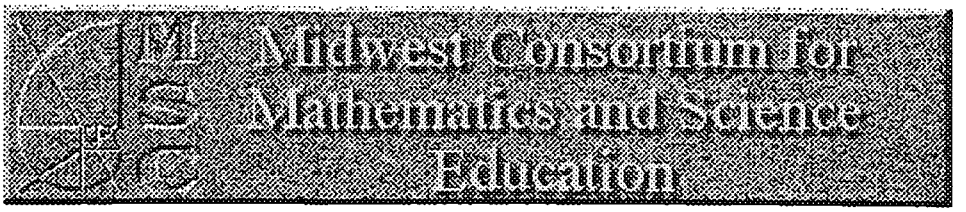
MIDWEST CONSORTIUM FOR MATHEMATICS AND SCIENCE EDUCATION
(WEB PAGE)

www.ncrel.org

MSC Features

- Exemplary Units
- First in the World
- Integrated Math/Science Resources
- Intensive sites
- Math Resources
- Science Resources
- Status Report
- Internet Lesson Plan Index

- Advisory Board
- State Team
- Staff
- ENC
- Other Regional Consortia



Mission Statement

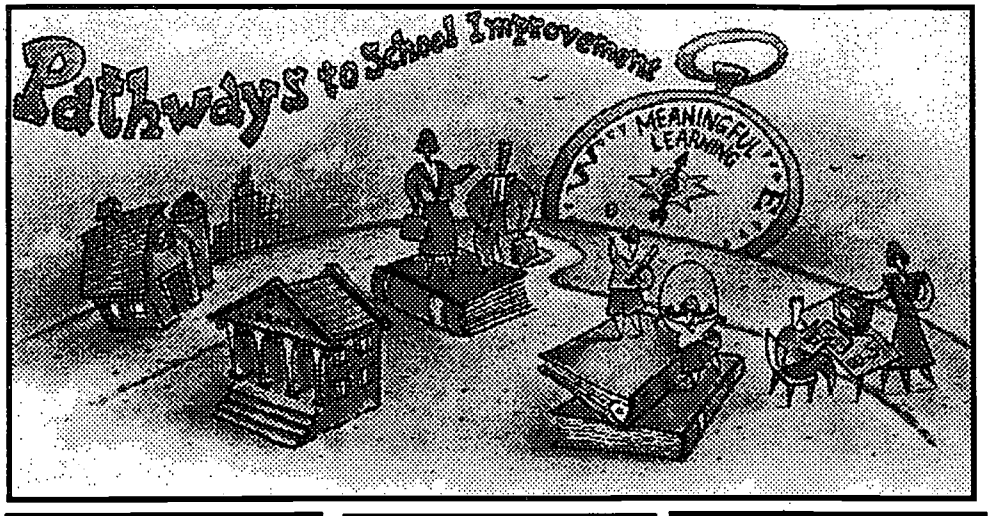
The Midwest Mathematics and Science Consortium (MSC) is engaged in providing direct technical assistance to state education agencies, intermediate state educational units, and local school districts. Activities reflect a commitment to learning based on a constructivist paradigm based on best practices and research to optimize the opportunities for all students to learn. The result of this technical assistance is to advance systemic reform of Mathematics and Science Education providing meaningful, purposeful, engaging learning in these areas available to all students. Whenever and wherever possible, the Consortium advocates and promotes the use of appropriate technology to support and accelerate systemic reform.

The MSC provides three Internet sites as electronic support tools. *Pathways to School Improvements*, which was co-developed with NCREL, features research-based information on school improvement with special sections pertaining to math, science, and professional development. *Learning Through Technology: A Planning and Implementation Guide*, which was co-developed with NCREL, ISBE, and NCSA, is designed to help educators and community members develop a comprehensive learning and technology plan.In addition, the *Systemic Mathematics and Science* web site describes innovative approaches to teaching and learning in math and science.

Send any questions, comments, and suggestions to Gil Valdez.

Exhibit 22

PATHWAYS TO SCHOOL IMPROVEMENT WEB PAGE



What's New! | Research | Getting Started

Search | Topics | Users' Corner NEW!

NCREL

(animated logo in Netscape 2.0+)

A product of the North Central Regional Educational Laboratory
in cooperation with the Regional Educational Laboratory network

Last update: November 19, 1997

Topics Currently Available:
(Click on Topics button above for a variety of
additional resources and a list of topics under development)

Assessment | At-Risk | Early Childhood | Governance | Leadership | Learning | Math | Parent and Family Involvement | Preservice Education | Professional Development | Safe and Drug-Free | School-to-Work | Science | Technology

---

Pathways to School Improvement Internet Server Team

content & general comments: info@ncrel.org-------technical information nauta@ncrel.org

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All of these features are supported by the World Wide Web, but the Midwest Consortium had to design them into its Web page. Such a sophisticated Web site requires careful thought and a significant investment of resources. Several of the Consortia have placed a priority on being on the cutting edge of technology and the Web. The others have established a simpler Web presence.

In the spring of 1996, the evaluation team completed a review of the Consortia's Web sites. During the summer of 1997, information on the Consortia's Web sites was updated. In both reviews, the Web sites of the 10 Consortia varied in size, sophistication, and content. The evaluators conducted a detailed examination of three Consortia Web sites that had an extensive Web presence in 1996 and updated that review in 1997.

In 1996, the WestEd Regional Consortium for Science and Mathematics (WERC) had a home page with 22 links, including a link for each of the four states in its service area. It referenced a major WERC project (Science Education Academy of the Bay Area, or SEABA), listed WERC's major partners (The California Alliance for Mathematics and Science and the University of California, Irvine), and included six topic areas: standards-based reform, content and pedagogy, assessment, equity in mathematics and science education, technology, and environmental education. The state pages, in turn, identified local science and math programs and resources. The topical pages listed relevant services and resources available at WERC and the WestEd Lab. At the time of this study, WERC was updating its site to reflect changes at its parent organization. It had also recently posted an electronic version of a new WERC publication, *Tales from the Electronic Frontier*, in which nine K-12 teachers described how they had used the Internet to improve math and science education. In addition, WERC was in the process of setting up a list server (a way of communicating through the Internet) to work with a group of collaborators on the California Science Standards. The Consortium also planned to incorporate the use of on-line interactive databases that would allow various participating organizations to contribute current information to the WERC Web site, such as adding local activities on a regional calendar of math and science events.

The WERC Web site in 1997 retained its basic structure but was far more sophisticated and offered access to more resources. WERC successfully implemented on-line interactive databases to produce a regional calendar of events and to facilitate the development and review of science standards for California. WERC leaders cite their investments in technology and the expansion of their Web site as particularly successful at furthering their overall work.

In 1996, the Web site of the Midwest Consortium at the North Central Regional Educational Laboratory (NCREL) had 17 links to national organizations (e.g., the other Consortia, ENC, AskERIC) and its own efforts and projects. The Midwest Consortium benefited from the fact that technology was the special focus assigned to NCREL and that NCREL operated the North Central Regional Technology in Education Consortium (NCRTEC). In addition to "Pathways to School Improvement" and "Learning Through Technology," the Midwest Consortium Web site referenced more than 60 other mathematics and science sites around the country. There was also a Gopher menu with hundreds of lesson plans in math and science.

By the summer of 1997, the Midwest Consortium's Web site was more fully developed. The Midwest Consortium continued to share technology expertise and resources with NCREL and NCRTEC. Although "Systemic Mathematics and Science" was still under construction, the Consortium's Web site included more links to what the Consortium had identified as exemplary materials, lesson plans, and other resources.

In 1996, the Hub, the site for the Regional Alliance for Mathematics and Science Education Reform, offered users an extensive set of resources on-line. The Regional Alliance benefited from the fact that it was located at TERC and was able to take advantage of the significant technological experience and expertise available there. The Regional Alliance Web site was also very regionally oriented. The site referenced the states in its service area through the Alliance Schools Network that was under development. It provided a page for each of seven states, Puerto Rico, and the Virgin Islands for the 33 schools that were members of the Alliance Schools Network. Each state and entity had a page for the statewide action teams that were identifying local and state priorities and resources in science, math, and technology. These pages listed links to science and math resources in the state. The Regional Alliance Web site provided access to numerous mailing lists, or list servers, that allowed users to get and send e-mail messages on a range of topics that included assessment, curriculum frameworks, equity, evaluation, professional development, and technology. As with other Consortia, the Regional Alliance Web site has matured and expanded since 1996. The site contains hundreds of links to mathematics and science resources and other organizations. The Alliance Schools Network is in place, although the individual school pages are underdeveloped.

In the spring of 1996, five of the Consortia had a very small Web presence, including two with a single page listing seven links, most of which were "under

construction." Three of those five had brief home pages that most often described the Consortium and its staff and listed six to nine links, which typically included references to the National Eisenhower Program, the ENC, and the Department of Education. However, by the summer of 1997 all the Consortia had greatly expanded their presence on the World Wide Web. For example, the Science and Mathematics Consortium for Northwest Schools (SMCNWS) had devoted significant staff resources to the development of its well-designed and resource-rich Web site.

By linking their sites to the ENC, the Consortia were able to meet an important responsibility: directing people to the resources of the ENC. The ENC Web site offered an extensive listing of resources and services in mathematics and science education, along with a collection of on-line documents, publications, lessons, and activities. Specifically, the ENC site included a catalog of science and mathematics curriculum materials, including print, video, audio, graphic images, software, and kits, from a variety of sources. Users could access these materials through the Resource Finder, a search tool that located materials on the basis of standard library information, such as author, title, subject, and date, along with information more specific to the needs of educators, such as grade level, target audience, evaluation, and the relationship of the materials to various curriculum standards. The catalog was available on-line via the Internet and on CD-ROM. The ENC Web site included a monthly "Digital Dozen," ENC-selected Web sites containing some of the best resources in mathematics and science. ENC Web site users could access selected journal articles on mathematics and science education, as well as ENC publications. The ENC Web site allowed users to access significant reform documents, such as the NCTM standards and the National Science Education Standards, as well as a limited number of state curriculum frameworks documents.

Promoting the Use of Technology through the ENC Demonstration Sites, Publications, Professional Development, and Technical Assistance

All the Consortia promoted the use of technology. Each had established ENC demonstration sites as another way to encourage educators to use the extensive resources of the ENC. Most Consortia provided direct professional development to teachers in the use of technology, usually in the form of summer institutes or short workshops designed to introduce teachers to the Internet. In addition, some Consortia lent their expertise to states and districts as they developed their technology infrastructures.

Demonstration Sites

The ENC demonstration sites were established primarily for classroom teachers, most often those in the immediate geographic area because of the constraints of time and travel. In addition, demonstration sites served technology and content specialists. These demonstration sites had two stated purposes. One was to give teachers the use of workstations and resource materials that they could use to develop lessons. The second was to provide teachers and other users with professional development experiences on the use of the Internet.

The sites were sometimes located in the facilities of collaborating organizations and sometimes in Consortia offices. For example, the Regional Alliance's demonstration site was at the Boston Computer Society, the Midwest Consortium's was at the Lederman Science Center at the Fermi National Accelerator Laboratory, and WERC's site was located in the Biodiversity Resource Center at the California Academy of Sciences. There were several advantages to locating the demonstration sites in these facilities. First, these sites were frequently more accessible to the general public and to teachers than Consortia offices. In addition, collaborating organizations frequently supplemented the resources of the Eisenhower demonstration site program. For example, the WERC demonstration site was located just inside the front entrance of the Academy of Sciences, a very popular natural science museum in San Francisco's Golden Gate Park. The two computers supplied by the Eisenhower program were augmented by several other, more powerful computers owned by the Biodiversity Center. The Center's extensive collection of software and other science-related publications supplemented the software provided by the program. Similarly, an additional 40 software programs and 160 CD-ROMs in the Biodiversity Center's collection supplemented the 15 software programs and 30 CD-ROMs supplied by the ENC. The potential downside to this arrangement was that the Consortia and ENC presence may not have been apparent in the midst of an often much larger collection and set of activities in the associated facility.

By the summer of 1997, several Consortia had changed the locations of their demonstration sites. In at least three cases, the Consortia had taken steps to increase access to the ENC in their region. The SMCNWS had moved its demonstration site to the popular Oregon Museum of Science and Industry and identified 22 colleges, intermediate education service agencies, and informal science organizations that agreed to make the ENC available at their sites. These ENC Access Centers dramatically increased opportunities for teachers in this large region to visit a site where they could be

introduced to the ENC resources. In another example of increasing access, WERC established a portable network that allows multiple users to access the World Wide Web at conferences, meetings, and other sites. Meanwhile, AEL has moved its demonstration site to different locations around the region. In addition, AEL and the Regional Alliance were working to establish ENC Access Centers throughout their regions.

Publications

All Consortia tried to promote the use of technology in mathematics and science classrooms by identifying and disseminating useful publications and curricular resources on the topic. Some Consortia also developed new publications to address the needs of teachers and others interested in expanding the use of technology in classrooms, as in WERC's *Tales from the Electronic Frontier*. The Mid-Atlantic Consortium's booklet on the Internet for teachers, *Internet Jones*, had been distributed to more than 26,000 teachers by the spring of 1997.

Professional Development and Technical Assistance

Some Consortia provided teachers with professional development to increase their use of technology. Although many Consortia professional development activities included technology components, some Consortia sponsored or provided workshops and institutes focused on technology specifically. For example, the Consortium at AEL collaborated with the Center for Excellence in Mathematics and Science Education at the University of Tennessee, Martin, to train teams of higher education faculty and K-12 teachers in technology. The Midwest Consortium presented workshops to several Illinois and Indiana school districts on using technology to support engaged learning. SMCNWS helped organize and sponsor a summer institute developed by staff from the Northwest Regional Consortium for Technology in Education and the ENC.

Other Consortia planned to expand their professional development activities on the use of technology. For example, both the Regional Alliance and WERC purchased portable local area networks (LANs)—sets of portable computers with connections to each other and the Internet—to use for off-site workshops on Internet-based resources in math and science. As reported in the chapter on networking and coordination, the Midwest Consortium was leading a collaborative venture to design and produce a professional development toolkit on CD-ROM, now scheduled for completion by December 1997.

A few Consortia provided technical assistance to state departments of education, statewide advisory committees, and individual school districts on the use of technology. For example, Midwest Consortium staff provided technology planning assistance to school districts and provided technical assistance to an advisory committee for technology in Illinois. WERC assisted Nevada in establishing a statewide computer network for educators.

Networking through List Servers

A list server (or "listserv") is a way of communicating through the Internet. It is similar to e-mail in that one person sends information to another, specified by a particular e-mail address. However, with a listserv, the sender can build a list of people who may want to communicate regularly for a particular reason and give this list a single e-mail address. The benefit is that a person can send one message to everyone on the list by using this single address. Any of the people receiving the list can reply, in turn, using that same address. Alternatively, all the original messages and their replies can go to a listserv manager, who decides which ones to post to the list.

By the spring of 1996, the Regional Alliance had established more than 70 listservs for its statewide action teams, its advisory board and steering committees, and other groups. In addition, it provided listservs on a number of topics, including curriculum, instruction, assessment, local framework implementation, equity, and K-16 collaboration. People interested in these topics subscribed to a list and periodically received information from the person who created the list and/or from any of the other members of the list. The level of activity on these listservs varied. The equity listserv had 235 messages posted from October 1995 through March 1996, whereas only 10 messages were posted on the New York Statewide Action Team listserv during the same period.

By the summer of 1997, the Regional Alliance had consolidated its listservs (from 70 to 29). A brief review of the postings on a sample of the listservs and a Consortium survey of subscribers suggests that usage has increased and the exchange of information is useful. Clearly, Regional Alliance staff have made an effort to regularly contribute to each of the listservs in order to help them become a valuable source of information for subscribers.

Outcomes Reported by Participants

The Consortia had done little to evaluate their technology services, partly because the Consortia's use of technology was relatively new and still evolving. Several

Consortia were planning to survey a sample of their users to assess impact, but, at the time of this evaluation, they had not yet detailed their plans for doing so. The most systematically collected data pertained to the number of teachers who had visited demonstration site computers and attended workshops. The Consortia collected and reported these numbers quarterly; for example, the Biodiversity demonstration site (WERC) reported that in one quarter 600 teachers attended six workshops that featured ENC materials, and 61 teachers stopped by the resource center to look for curriculum materials.

The Consortia were beginning to collect data on the use of their Web sites. For example, the Midwest Consortium reported getting about 3,000 accesses (or "hits") a week on the math and science pages on the Pathways to School Improvement site, and the Regional Alliance reported getting about two hits a minute on its home page. However, at that point, information on the use and impact of Consortia Web sites was still limited.

By the summer of 1997, some of the Consortia had begun more systematic evaluations of their use of technology. As was mentioned in the preceding section, the Regional Alliance conducted a survey of some of its listserv subscribers. The overwhelming majority found the listservs "useful or relevant" and "shared list postings with colleagues."

The evaluators were able to gather some data from participant surveys. Among all participants surveyed, 29 percent had visited their Consortium's home page and/or databases, and another 21 percent had visited the home page and/or databases maintained by the Eisenhower National Clearinghouse. Among those who visited Consortia home pages, between 80 percent and 90 percent rated the sites as "good" or "excellent." In addition, the more intensive and repeated the participant's contact with the Consortium, the more likely the participant was to have visited the home page.

The survey also indicated that school staffs visited a Consortium Web site less than other groups of educators. Only 14 percent of teachers, 23 percent of school district officials, and 21 percent of intermediate service agency staff reported visiting a Consortium Web site. In contrast, 38 percent of state officials and 39 percent of those from higher education institutions reported doing so. It is reasonable to assume that differences in access to technology among these different groups explain some of the variation in the use of Consortia Web sites.

Strengths and Weaknesses of the Consortia's Use of Technology

The Consortia used technology, in varying degrees, to offer information about themselves, to disseminate curricular resources and information about school reform, to facilitate communications between groups of educators, and to promote the use of technology in classrooms. In looking across all 10 Consortia, the evaluation team found some promising examples of each of these uses. At the same time, it found some unresolved issues associated with each use of technology.

Web Sites

The Consortia's Web sites demonstrated potential to advertise each Consortium's activities and to direct users to curricular resources and information. As the use of the technology matures, the Consortia will need ways of collecting data that can help them better understand their efforts' impact on clients.

Some of the data can be collected automatically. It is possible to design a Web site that counts how many visits it received, how many visits there were to each of the site's locations or pages, the date and time of each visit, the duration of time from one visit to the next, the IP (Internet Protocol) addresses of the machines that visited the site, and the address of the Web site visited just before a visit to the target Web site (i.e., the navigation route visitors took). This information would tell a Consortium how often its material was being used and which pages were used most often. A Consortium could also determine how frequently visitors entered its site from another Consortium, the ENC, or elsewhere. The ENC could determine what number and percentage of its visits were referred from one of the Consortia or the technology demonstration sites. Few Consortia kept such detailed records or analyzed them in this way. However, automatically collected data do not indicate which audience accessed the Web site, what use people made of the information, or how useful they found it. For that kind of information, the Consortia will need to use surveys or other methods.

Teacher Access and Usability

Another issue in assessing the Consortia's use of technology is that telecommunication is a two-way street. No matter how much information the Consortia provide, the effectiveness of the effort will be limited if schools and classrooms do not have the telecommunication services with which to access the information.

In the fall of 1996, the National Center for Education Statistics (NCES, 1997) surveyed 911 public elementary and secondary schools about their access to telecommunication services. The study reported that 65 percent of U.S. public schools had access to the Internet. Although a large number of schools did not have access, their number was decreasingly rapidly; the percentage of schools that were connected increased from 35 percent to 65 percent in just 2 years. Of those schools that were not connected, 85 percent reported that they planned to be by the year 2000.

It is important to note, however, that access to the Internet was not equally distributed across school systems. Only 53 percent of schools with large proportions of students from poor families had access. In addition, although the number of schools that had access was significant, the number of classrooms that were connected was still small. Only 14 percent of all instructional rooms (classrooms, labs, and library media centers) were on the Internet. This low level of classroom access means that teachers' and students' use of the Internet was still limited.

However, there were signs that the situation was changing. As with schools, the number of classrooms that were connected to the Internet was growing quickly. The 14 percent figure reported in 1996 was a fourfold increase since fall 1994, when only 3 percent of all instructional rooms had access to the Internet.

The type of connection that schools had also limited their use of the Internet. In fall 1996, 74 percent of the schools that had access to the Internet reported using modems. This is the lowest form of bandwidth, or speed, at which materials can be downloaded. This is particularly problematic when using the World Wide Web. Thus, although a growing number of schools had some form of access to the Internet, relatively few had easy access to the World Wide Web.

Linkages and Value Added

By the spring of 1997, the Consortia had not yet fully linked their Web sites so that users who found a resource in one Consortium Web site were directed to similar resources in other Consortia or ENC sites. Such linkages represented a coordination challenge. As each Consortium continues to expand its Web site with curricular and other resources similar to those offered by other Consortia or the ENC, much closer coordination will be necessary to avoid redundancy and streamline user access.

The issue of fuller linkages between Web sites raised the much broader question about the value added by the Consortia's presence on the Web. The World Wide Web

contains exciting, highly graphic information related to science and math. Are additional Web sites needed when there is so much high-quality information already available from the Exploratorium, the Smithsonian, NASA, dozens of NSF projects, and hundreds of universities? What are the unique contributions of the Consortia Web sites?

Consortia directors argued that teachers did not always know about the availability of materials, how to locate them easily, or how to find them in a usable format. Consortia need to consider the value that their Web sites add to their efforts, keeping their focus on the unique or special purpose of their sites and on the most effective use of constrained resources

Listservs and Other Communication Tools

Earlier, this report described how some Consortia created listservs to promote networking and communication among educators. These listservs varied in their levels of activity. As Consortia directors who used listservs learned, listservs must be attended to if they are to attract attention and be active. That is, Consortia staff had to continually stimulate conversation among very busy educators. Just establishing a listserv did not guarantee communication and networking.

As teachers' access to the Web increases, the Consortia will be able to use their growing interactive capabilities. Technological developments already allow users to interact in real time over the Internet. These new interactive environments open up new and interesting ways for the Consortia to provide professional development services and technical assistance if they were to develop the tools and interactive materials for doing so. But, as with listservs, the newer interactive environments require additional staff time and attention.

Supporting the Federal Role in Promoting the Use of Technology

The federal role in promoting the use of technology in education is to provide "the momentum to support state and local efforts to meet the technology literacy challenge. This is done through leadership, targeted funding, and support for activities that will catalyze national action" (U.S. Department of Education, 1996).

Recently, the Report to the President on the Use of Technology to Strengthen K-12 Education in the United States (Panel on Educational Technology, 1997) made specific recommendations that further elaborate both the potential federal role and present a coherent strategy. To summarize, the report recommends that the federal strategy:

- Focus on learning with technology, not about technology.
- Emphasize content and pedagogy, not just hardware.
- Give special attention to professional development.
- Engage in realistic budgeting.
- Ensure equitable, universal access.
- Initiate a major program of experimental research.

The challenge for the Consortia as they continue to promote and use technology is to make sure that they are guided by these principles. Through their Web sites and professional development efforts, the Consortia can follow the Panel's guidance and emphasize learning with technology, as well as content and pedagogy. As the Consortia provide technical assistance to states and districts, they can promote realistic budgeting and equitable, universal access. Finally, the Consortia can help disseminate research.

In addition, the Consortia must coordinate their efforts with others involved with technology and education. For starters, the Consortia with the strongest technology capacity can lend expertise to the other Consortia. The Consortia have made significant progress in upgrading and linking their Web sites and promoting the ENC, and some have expanded their professional development activities on learning with technology. But better coordination and communication between Consortia staff involved in learning with technology could help all Consortia advance in this area.

Many of the Consortia do collaborate and coordinate with other federal programs that support the use of technology. However, there are some inherent difficulties in such collaboration. As with Regional Technology in Education Consortia, some federal programs are short-lived, serve regions that don't match the Consortia's regions, and are housed in organizations that are potential competitors with the Consortia for federal funding. Despite these difficulties, more and stronger relationships across federal programs involved with technology in education would go a long way in supporting learning with technology.

VII. NETWORKING AND COORDINATION

The statute authorizing the establishment of the Regional Consortia Program (P.L. 101-589, Title II) directed the Consortia to "if feasible, maintain on-line computer networks with all regional consortiums and the National Clearinghouse for Science and Mathematics Education Materials" (Sec. 2017). It contained no other reference to forming a national network. Nevertheless, as noted in the First Interim Report of this evaluation, "there was an expectation (in Congress) that the Consortia would be organized as a national network" (Haslam, Colopy, & Turnbull, 1996). Subsequently, under IASA, Congress made its expectation more explicit by saying that the Consortia may use their funds to "work cooperatively with the other regional consortia, the Eisenhower National Clearinghouse...and federally funded technical assistance providers to more effectively accomplish [their work]" (Sec. 13302).

Early in the program's development, the Consortia made progress in forming a national program identity through their networking activities (Haslam, Colopy, & Turnbull, 1996). Consortia directors and staff recognized, however, that despite potential payoffs of working together and with other assistance providers, their first order of business had to be building their own capacity and working out relationships with their host organizations. In addition, delays in organizing the Eisenhower National Clearinghouse (ENC) slowed an important dimension of their network-building activities. The Consortia have been actively involved in networking and coordination activities following the early years. In fact, the Consortia and the ENC proclaim their determination to work together as a network on an Internet home page, which identifies them as the "National Network of Eisenhower Regional Consortia and Clearinghouse."

This chapter reports the evaluators' findings about the Consortia's continuing networking and coordination efforts. Specifically, the chapter examines the Consortia's collective efforts on:

- The development of a common data collection system and program performance indicators.
- The use of cross-Consortia committees and task forces.
- Coordination with the Eisenhower National Clearinghouse.
- Coordination with other assistance providers.
- Coordination efforts with other federal education reform initiatives.

The chapter concludes with a summary of the strengths and weaknesses of the Consortia's networking and coordination efforts.

Development of the Consortia Data System and Program Performance Indicators

The Consortia directors and the Consortia evaluators have concentrated a considerable amount of their attention on the development of the Consortia data system and program performance indicators. Discussions and work around these tasks have focused on identifying the core elements of what the Consortia do and how their work should be reported to OERI and to Congress.

The Cross-Consortia Descriptive Data System (CCDDS) represents a significant investment by the Consortia in creating a common descriptive framework for reporting on their work in the aggregate to OERI and to Congress. As a review of the Consortia's annual report suggests, individual Consortia also use CCDDS data to report on their own portfolio of activities. Several Consortia evaluators also reported that reviewing the CCDDS data helps Consortium staff reflect on their work and, from time to time, consider options for changing it.

Early progress on the reporting system took longer than the Consortia expected—in part because of the difficulty of agreeing on the definition of an "activity" to guide the reports on participants, content, duration, and resources expended. As one Consortium director who was very active in these efforts in the spring of 1996 explained:

> Our mission for now is to describe what the 10 Consortia do and to help each Consortium to look at their distribution of activities.... We'll see a big difference in approaches. I hope there will be a conversation as to why these differences exist. I hope this will be a good way to reflect on the program overall.

As of January 1997, the CCDDS contained descriptive information on six categories of Consortia activities and services: product development, collaboration and network building, information dissemination, planning assistance, technical assistance, and training.

The work on the program performance indicator system, carried out in conjunction with the Eisenhower Program Office in OERI, led the Consortia to extend the work on the CCDDS by focusing on program outcomes. The draft performance indicators, which were submitted for review by the Acting Deputy Secretary of Education in September 1997, after more than 18 months of work by the Consortia and OERI, affirm the

Consortia's commitment to carrying out the broad set of responsibilities assigned to them by Congress and in the Department of Education's priorities. The performance indicators are defined around six program objectives:

- Provide high-quality technical assistance (including planning assistance, technical assistance, and training).
- Provide continuing technical assistance to individuals who (a) will assist or train others and/or (b) will work with at-risk, underrepresented, and/or underserved populations.
- Identify promising and exemplary practices in education.
- In coordination with the ENC, disseminate information about promising and exemplary practices in mathematics and science education.
- Contribute to collaboration and networking with targeted groups within and/or across states.
- Contribute to the use of informal education entities (e.g., science and technology centers, museums, libraries, Saturday academies, 4H programs).

The development of CCDDS and the program's performance indicators have the potential of adding clarity and focus to the program's identity and mission. In particular, the indicators set performance benchmarks that represent consensus among the Consortia about the particular outcomes they will strive to achieve, priorities for areas of work and types of individuals to target for Consortia activities, and strategies that will be used.

Data collected recently also point to some positive benefits for individual Consortia's evaluation efforts. For example, some Consortia annual reports draw heavily on the CCDDS and are beginning to address the performance indicators. At the same time, Consortia staff say that their internal evaluations of both quality and impact continue to rely on significant amounts of anecdotal evidence.

Cross-Consortium Committees and Task Forces

A second dimension of the Consortia's collaborative activities has been the work of four committees or task forces. In the spring of 1997, these included:

- The Communications Committee, which is responsible for preparing reports on the Regional Consortia Program and the ENC.
- The Equity Task Force, which is compiling resources on equity issues as they pertain to mathematics and science education. According to the 1997 annual report of the Regional Alliance, the Equity Task Force completed work on the

Equity Resource Guide in January 1997 and expected to produce a CD-ROM by October 1997.

- An Evaluation Committee, which works with the directors on the reporting and indicators systems and other issues related to program evaluation and will revise the survey instruments used in this evaluation and pilot test the performance indicators data collection and reporting systems in 1997-98.
- The Professional Development Task Force, which is developing a CD-ROM toolkit on professional development.

In all of these committees and projects, one Consortium assumes lead responsibility for the activity and for developing the related products. Other Consortia assign at least one member of their staff to the group or team.

Overall, the work of the committees and task forces appears to have taken advantage of economies of scale by producing one product useful to all 10 Consortia. In addition, individual Consortia have been able to take advantage of the large pool of expertise among all Consortia staff.

Collaboration and Coordination with the Eisenhower National Clearinghouse

The Consortia's work with the ENC was another example of collaboration under way within the Regional Consortia Program. The Consortia and the ENC work together in a variety of ways. First, the Consortia directors meet regularly and communicate often about issues of concern to the Regional Consortia Program. The ENC director participates in most, if not all, of these meetings and other communications. Indeed, he served for a year as the chairperson of the group. The ENC is also active on the committees and task forces charged with developing products for dissemination and use by all of the Consortia and the ENC. In addition to participating on these committees, the Consortia have worked closely with the ENC to establish an on-line database of informal science education resources. According to 1997 Consortia reports, the database provides clients with descriptive information on over 1,200 organizations and centers across the nation offering informal science programs and activities.

In addition, the Consortia work with the ENC to collect and disseminate information about mathematics and science education. This work became a fairly routine part of Consortia operations: the Consortia provided materials to the ENC and helped to publicize the ENC as a resource. The ENC, in turn, advised the Consortia on packaging materials. According to Consortium directors, all these activities required modest

investments of staff time and resources, although individuals with lead responsibility for organizing the groups and product development sometimes spent considerable time on these tasks.

Coordination with Other Assistance Providers

When the Consortia first began operations, they had a mandate to coordinate their work with state and local reform initiatives and other external providers. As reasonable as this mandate might have seemed, it was difficult to carry out. First, as noted earlier, the Consortia had to attend to their own internal development issues. Second, many major reform initiatives were already well under way, and, consequently, the Consortia were relatively late arrivals on the scene. Third, the mandate to coordinate was a one-way street. No federally sponsored technical assistance providers or other recipients of federal support for the reform of mathematics and science education had a mandate to work with the Consortia.

This situation has changed. The Consortia are well on their way to becoming partners with other assistance providers. One of the most important changes is that the Regional Educational Laboratories, the new Comprehensive Technical Assistance Centers, and the Regional Technology in Education Consortia have mandates to coordinate their services with the Regional Consortia, among others. In the spring of 1996, the new technical assistance centers were just beginning their work, and, like the Consortia 3 years ago, they were concentrating on building their organizations and marketing themselves in the field. Therefore, it was not surprising that the evaluators saw no evidence of extensive coordination of services between the Consortia and these other providers. There were, however, several promising starts.

The host Regional Educational Laboratories of three Consortia—WestEd, which houses WERC; Appalachia Educational Laboratory (AEL), the host institution for Consortium at AEL; and the Southwest Educational Development Laboratory, where SCIMAST is located—were awarded grants to operate Comprehensive Technical Assistance Centers. The host educational laboratories for the Midwest Consortium and the SERVE Consortium—the North Central Regional Educational Laboratory (NCREL) and SouthEastern Regional Vision for Education (SERVE), respectively—received grants to form technology consortia. In two of these cases—the Consortium at AEL and the Midwest Consortium—there is some overlap in staff: the directors of both Consortia are

also assigned to the new technical assistance centers. As the director of the Consortium at AEL explained:

> This is a great arrangement for us and for our ability to work with the field. When somebody calls with a question or a request, we know exactly where to send them—usually just down the hall—and we have a lot more things to offer them. This is a lot less confusing for our clients and a lot more effective for us.

The Midwest Consortium director added that locating these programs in the same institution made it easy to leverage resources from the technology center and from the laboratory's technology program to support Consortium activities and services.

These two examples illustrate the benefits of locating various technical assistance centers in the same host organization. They also suggest that these arrangements may be most effective when staff assignments overlap, particularly at the director level. What look like obvious opportunities for coordination to someone assigned to both organizations may appear less obvious and less easy when there is no overlap.

In a third example of coordination, under very different circumstances, at least two Consortia were involved in nascent efforts to coordinate parts of their work with other technical assistance centers in their regions. The director of the High Plains Consortium (HPC) joined with the director and staff of the regional laboratory, the Mid-continent Regional Educational Laboratory, to host a meeting of representatives from the 11 other federally supported technical assistance centers that work in some portion of HPC's service region. In a similar effort, the co-directors of the Regional Alliance began to meet with the directors of other technical assistance centers in the Northeast "to get to know each other, to look for ways that we can coordinate our services, and to discuss common problems and concerns." This group met several times during spring 1996, and, according to one of the Regional Alliance's co-directors interviewed at the time: "At this point, none of us is quite sure where this is going, but it is very clear that we need to continue talking and that there are some real advantages in working together." According to the 1997 annual report of the Regional Alliance, this group continues to meet. A listserv created and maintained by the Alliance facilitates its work.

In the spring of 1996, the co-directors of the Regional Alliance reported a fourth, more concrete example of a partnership being formed with another technical assistance provider. A Desegregation Assistance Center in the Northeast included support for the Regional Alliance's Equity Steering Committee in a proposal to the Department of Education. The Equity Steering Committee, with some additional members chosen by

the Desegregation Assistance Center, were to act as the center's advisory group. This role ensured the continuation of the Equity Steering Committee and represented an opportunity for coordination between the center and the Regional Alliance.

Coordination with Other Federal Mathematics and Science Education Reform Initiatives

All the Consortia have entered into a variety of other working relationships with other major federal mathematics and science education reform initiatives. Prominent among these partnerships are those with the National Science Foundation's various systemic reform projects: the Statewide Systemic Initiatives (SSIs), the Urban Systemic Initiatives (USIs), and the Rural Systemic Initiatives (RSIs). The Consortia also became involved in supporting some of the Department of Education's Eisenhower State Curriculum Frameworks Projects. Some Consortia focused their support for the development and dissemination of curriculum frameworks in states that did not receive Eisenhower State Curriculum Frameworks Project grants. The Consortia have assisted individual projects and facilitated several networks of framework projects. Consortia's work with and support for other federal mathematics and science education reform initiatives has included, but certainly has not been limited to, the following:

- Direct financial support for project activities or events (e.g., support for printing and disseminating a curriculum framework, support for convening a meeting).
- Technical assistance in completing key project tasks or activities (e.g., assistance in planning or convening a meeting or other event).
- Convening state, regional, and national meetings of projects to address common themes or tasks.

Specific examples include the following:

- In Maine, the Statewide Action Team organized and supported by the Regional Alliance earmarked $10,000 available to the team from the Alliance to support a pilot effort to implement a new state curriculum framework. Other state teams supported by the Regional Alliance have used Consortium resources for similar activities.
- The Midwest Consortium has provided a variety of professional development and training to district staff involved in Urban Systemic Initiatives in Chicago, Columbus (Ohio), and Detroit. According to Consortium reports, topics of these activities included team building, the change process, and new curricula in mathematics and science education. In each site, the Consortium has provided a series of activities that have extended over periods ranging from several weeks to more than a year.

- The SSI Network sponsored by SCIMAST, and discussed in more detail in the earlier chapter on Consortium teams and networks, brought together directors and staff from SSI projects in the Consortium's service region to discuss topics of common interest and concern related to the implementation and operation of their projects.

According to Consortium reports, some of this assistance leveraged other kinds of assistance and resources. In other cases, Consortium resources were the glue that held otherwise disparate elements of a project together. Leaders and staff of these projects reported that Consortia networks and other forums presented important and useful opportunities for them to meet with colleagues from other projects and other states. In the Northeast, project directors have participated in all of the Regional Alliance's teams and networks. In an interview conducted in the spring of 1997, one SSI project director explained the benefits of her participation for her state's SSI project this way:

> We wanted to develop a handbook for disseminating our framework, but we really didn't have the time or the money to develop it. Then, in a meeting sponsored by the Alliance, we found that another SSI project in our region had already developed a handbook like we needed. So, with only a few changes, we were able to borrow theirs for our state. This was really helpful to us.

In this and other regions, SSI staff have typically served as members of their Consortium's regional advisory boards and state teams. These affiliations give them opportunities to advise the Consortium on their needs and interests. Currently, most of the SSIs and State Curriculum Frameworks Projects are completed or nearly completed. Consortia partnerships with USIs and RSIs, which currently are a large part of the portfolio of the Midwest Consortium, are continuing.

Data collected in the spring of 1996 and 1997 suggest that the Eisenhower State Programs and Goals 2000 have not appeared on the Consortia's list of active collaborations. Eisenhower State Program staff have served on Consortia advisory boards and been members of state teams, but, as of spring 1997, only the Pacific Mathematics and Science Consortium (Pacific Consortium) reported any extensive involvement with an Eisenhower State Program. In this case, the Consortium links its programs with programs sponsored by the Eisenhower State Program to "ensure that projects are building on each other and to make sure Visions and Dreams [a Consortium program] steps in for worthwhile projects that Eisenhower can't fund." Other Consortia reported more limited examples of work with Eisenhower State Programs. The diffuse nature of the Goals 2000 projects in the states may account for the lack of coordination opportunities available to the Consortia.

Strengths and Weaknesses of Consortia Networking and Coordination

Consortia efforts to work together and with others have had some important payoffs. In each of the examples described in this chapter, the evaluators found clear benefits of the Consortia's networking and coordination efforts.

The development of the Regional Consortia Program's performance indicators and the CCDDS has contributed—and may continue to contribute—to the Consortia's capacity to reflect on, describe, and assess the impact of their activities and services. In addition to benefiting the Consortia, these systems are also likely to help ED monitor the work of individual Consortia, as well as the Regional Consortia Program itself.

Cross-Consortia task forces and committees developed products to help all the Consortia achieve economies of scale and allow them to capitalize on the strengths of other Consortia. As one director put it, "For a relatively small investment, we get a lot of valuable tools and products that we can use in our regions."

The creation of the professional development CD-ROM toolkit, which is led by staff at the Midwest Consortium, illustrates the potential of these collective ventures to enhance the quality of Consortia activities and services while achieving some economies of scale. As the discussion on Consortia uses of technology in the preceding chapter described, the Midwest Consortium for Mathematics and Science Education (Midwest Consortium) and its host organization, the North Central Regional Educational Laboratory, have considerable production capacity and experience from the development of *Pathways to School Improvement*. By taking advantage of this capacity, other Consortia can obtain a higher-quality toolkit than they might have created on their own and without heavy investments in developing their own capacity.

Collaboration has also served as a professional development vehicle for Consortia staff. Some networking activities, such as the Equity Task Force and the Professional Development Task Force, gave at least some Consortia staff with similar interests the chance to work together.

In the spring of 1996, the Consortia's relationships with new federally sponsored technical assistance providers were just beginning to develop. These will take time to mature. Several early examples point to the advantages of housing these providers in the same organization and of some overlap in staff. One advantage is the relatively easy coordination of service delivery; a second advantage is the ability to leverage resources from one provider to serve the clients of another. These advantages can be readily

achieved when staff have assignments in both organizations and when they have authority to allocate the resources of both organizations. These advantages may be much more difficult to achieve when there is no overlap in staff or when the providers have different organizational homes.

Consortia partnerships with other organizations engaged in mathematics and science education reform represented opportunities for strategic investments of Consortia resources. Consortia partnerships with NSF's various systemic reform initiatives and some of the Eisenhower State Curriculum Frameworks Projects have helped these projects complete their work and have made it possible to do things that would not have been possible under their original grants. The Consortia have not been as successful in forging working relationships with Eisenhower State Programs (except in the Pacific region) or Goals 2000 programs.

As in other areas of their work, the Consortia need to be strategic in their selection of partnerships and networking opportunities. Given their limited resources to address complex issues, the challenge to the Consortia has been to weigh these opportunities against each other before investing and to assess the impact once the investments have been made.

VIII. CONCLUSIONS

The purposes of this national evaluation of the Eisenhower Regional Consortia Program have been to describe the organization and evolution of the program and the Consortia themselves and to analyze the contributions that the Consortia have made to the improvement of mathematics and science education. This report has focused on the quality and impact of activities and services that were prominent in the Consortia's portfolios of assistance to their regions and the nation. These activities and services have included professional development, support for teams and networks, dissemination of a volume on promising practices in mathematics and science education, and, more recently, intensive work with selected local sites. The latter set of activities, which frequently included a variety of professional development, training, and technical assistance, represents the Consortia's response to an invitational priority set by the Department for the second grant period. In addition, the evaluators reviewed the Consortia's varied uses of technology, as well as the collaborative work among the Consortia, the Eisenhower National Clearinghouse, and other active participants in the mathematics and science education reform arena. The sample of activities included in this evaluation represent only a portion of the activities and services provided by the Consortia. The full set is actually considerably larger. However, based on reviews of Consortia reports and interviews with Consortia staff, the evaluators concluded that these activities are generally representative of the full range of activities and services provided by the Consortia during the first 5 years of operation. This concluding chapter reviews the key findings from the national evaluation and presents the evaluators' general assessment of the Consortia's contributions to mathematics and science education, as well as evaluators' observations about the continuing evolution and maturation of the program.

Evolution and Maturation of the Consortia

From the outset, the Consortia have faced the challenges of carrying out an ambitious agenda of service to their regions and building and maintaining the capacity to provide those services. As reported in the First Interim Report on this evaluation, the Consortia devoted considerable time and energy in the first few years of their existence to building their individual and collective capacity and to establishing solid working relationships among themselves and with key stakeholders, constituents, and potential participants and recipients of their activities and services (Haslam, Colopy, & Turnbull, 1996). Near the end of the program's third year, the evaluators concluded that the

Consortia had "generally succeeded in this critical task." Given that these were new organizations and that they faced a crowded and not always welcoming reform area, this was no small accomplishment.

By the spring of 1997, the Consortia's portfolios of activities and services had become relatively stable, suggesting that the Consortia have matured as organizations, and along with the ENC, as a national program. However, the Consortia's main functions and the list of authorized activities are very extensive. In choosing among various options for carrying out these functions and engaging in at least some of the authorized activities, the Consortia have been influenced by demands—which are not always clear or even very stable—from the state and local levels and by their own institutional capacities to do some things and not others. In addition, Consortia choices—like the choices made by many federal grantees—are influenced by the Department's invitational priorities and requests for services, which provide strong messages about the Department's expectations. As a result of these myriad factors that influence their choices, the Consortia have provided a wide range of activities and services to very diverse groups.

The Department's invitational priority to concentrate at least some resources and services in work with intensive sites, which was included in the solicitation for the second funding period, posed a real challenge to the Consortia as they tried to think strategically about how to maximize their impact. Given their relatively modest resources, should they invest in activities that reach large numbers of people in limited ways or concentrate on serving fewer people and programs more intensively? As the Consortia that are providing these intensive services are learning, these services are expensive and make significant demands on Consortia resources, including both funds and staff. At the same time, the Consortia appear to have concluded that they must continually try to maintain a balance between the more intensive services and less intensive services as they look for opportunities in their states and regions.

The evaluators conclude that, in the future, it will be important for the Department to continue to work with the Consortia to maintain this balance and to preserve their options to pursue promising opportunities. Among other things, this will entail recognizing the balance between the Department's priorities and expectations and those of the states and of the Consortia's regional boards and providing the Consortia with the latitude to make choices.

The Contributions of Consortia Activities

Across all the events, products, and working relationships for which the evaluation team collected data, participants and others who were familiar with the work of the Consortia generally praised the Consortia. In the spring of 1996, substantial numbers of survey respondents credited their participation in Consortia activities with making at least a "moderate" contribution to their knowledge, skills, and professional activities. In many instances, participants called the contribution "major" with regard to changes in their knowledge, skills, and individual or organizational behavior. These perspectives were also echoed in interviews conducted throughout the evaluation.

As of the spring of 1996, the evaluators concluded that the following activities and strategies stood out as particularly effective in achieving their purposes:

- Professional development activities, when the Consortia worked with individuals and organizations that were themselves poised to deliver services to others or to engage in organizational change.
- A package of grants, training, and follow-up with organizations that themselves start from a base of commitment and capacity to support instructional improvement.
- Financial support and substantive contributions to teams and networks that have a clear sense of their purpose.
- Creation of a new and welcome forum for communication among individuals active in reform who are the members of almost every team and network.

In addition, this list should include the Consortia's partnerships and collaborations among themselves and with others. For the Consortia and the Eisenhower National Clearinghouse, the partnerships have resulted in increased capacity to provide services at the national, regional, and state levels. For other partners, these relationships have yielded valuable resources and assistance in carrying out their work. An important characteristic of most, although perhaps not all, of these activities is the extent to which the Consortia provided more than one type of resource or used their support to leverage additional resources to support the participants, or both. The evaluators also found an area with considerable potential: the Consortia's use of technology, which by 1997 was increasingly sophisticated.

Also, in the spring of 1996, the evaluators concluded that on the basis of the survey and other data collected at the time, it was too early to determine the effectiveness and impact on other interesting and potentially valuable activities. One of these was long-term direct work with teachers in study groups, which had stimulated professional

conversations and experiments with new classroom practices, but had so far transformed instruction in few, if any, classrooms.

Finally, some activities appeared to have more limited impact and suggested the need for a review of their purpose and organization. For example, the dissemination of the book of promising practices was successful as a straightforward dissemination activity, but recipients who remembered receiving the book reported very little change in behavior. Data from the evaluation suggest that if the larger goal of the activity is to effect change in individual or organizational practice, some investment, albeit a modest one, in follow-up will increase the impact. Consortia support for state teams in states with ambitious and complex reform initiatives or in states in which state priorities and leadership are not well defined is a second example. In these cases, the support may have limited payoff until there have been extensive discussions about the roles that Consortia support can play and how these roles will address the new and evolving priorities.

Looking across these findings and more recent data collected in the spring of 1997, the evaluation team concludes that the Consortia did indeed add something of value to the nation's mathematics and science education reform efforts. In some cases, the value was added in terms of reported increases in knowledge and skills. In other cases, the value was added by increased opportunities to communicate and collaborate with colleagues and peers who shared common concerns and tasks. At the institutional level—including state and local reform initiatives—value was added when Consortia resources and other assistance facilitated the next step in a task or project—possibly one that was not in the original plan or budget but that became important later.

Experiences in the more successful activities point to the programmatic advantages of working with people and programs who are committed to and poised to make changes or improvement. Careful targeting and reaching agreements on long-term efforts and the availability of other resources have obvious payoffs. Initial experiences in at least some of the intensive sites also point to the importance of gaining commitments from the sites to engage in improvement efforts and to work with the Consortia in doing so. Both of these lessons are reflected in the "Strategies" included in the program's new performance indicator system.

These important lessons about targeting beg the question about working in the neediest sites. Experience in sites that are willing to commit to trying to make improvements and to working with the Consortia but that have made little or no progress on their own and that have very limited capacity to do so, points to the need for

substantial investments of time and money just to get started. The nine low-performing schools assisted by the Consortium at AEL are a good example. In these sites—sites that are probably most in need of help—there is a risk of failure or at least very slow initial progress. The Consortium at AEL and other Consortia have decided that the potential benefits of this work make the risk of failure or limited progress acceptable. It will be important for the Consortia and the Department to encourage and support this work by setting and maintaining their expectations accordingly.

Challenges for the Future

By the spring of 1997, the Consortia had matured as organizations, both in terms of their capacity to provide a variety of services and to work in concert with a variety of other players in mathematics and science reform. Accordingly, since the early years of the program, the individual Consortium portfolios have taken on a clearer focus. These are important accomplishments, particularly in the face of the challenges the Consortia faced from the beginning of the program. The continued development of the Consortia reporting system and of the Regional Consortia Program's performance indicator system have the potential of adding more clarity and focus to the program's purpose, particularly as future national evaluations and the Consortia's own internal evaluations report on the Consortia's performance against the new performance indicators.

Clarity of purpose and focus is critical because the Regional Consortia Program and the individual Consortia continue to confront the difficult choices inherent in the omnibus character of the program's charge and priorities from OERI and Congress, as well as the diverse needs and priorities of their regions. The Consortia have tried to do many things, but they are not big enough—in terms of staff and resources—individually or collectively, to do everything in improving mathematics and science education. At the same time, the program is neither small enough nor yet secure enough to pick a tightly specified mission and stick to that mission. To the extent that this tension informs an ongoing dialogue about what the Consortia can and should do and guides thoughtful decisions about priorities, it will have a beneficial effect on the program.

Thus, the overall value added and obvious maturation of the Consortia notwithstanding, the final conclusion of this evaluation is that important challenges lie ahead—challenges to be addressed by the Consortia, by OERI, and by Congress as they look ahead to the future of the program. When viewed in the context of the ambitious goals for the Regional Consortia Program, the current annual funding level of $15 million

looks like a relatively modest investment in solutions to large and complex issues. Consortia collaborations to achieve economies of scale and to take full advantage of the special capacities of individual Consortia coupled with assistance strategies that leverage resources from other institutions and programs have helped stretch these limited resources. These observations as well as similar observations about elements of the Consortia's work point to a recurring theme in the evaluation findings: the importance of making strategic choices about investing limited resources to achieve maximum impact. Therefore, it is incumbent on both OERI and the Consortia to continue seeking clarity about the program's mission and how well that mission is carried out, to set appropriate expectations for the quality, scope, and impact of the Consortia's portfolios of activities and services, and to monitor the extent to which those expectations are met.

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Appendix A

SURVEY PROCEDURES AND INSTRUMENTS

SURVEY PROCEDURES

Survey Development

The evaluation team developed three questionnaires to collect data on participant/recipient satisfaction with three categories of Consortia activities and services: professional development, support for teams and networks, and dissemination of information about promising practices. The instruments are included as Exhibits A-1, A-2, and A-3 at the end of this appendix.

The instruments include a set of common items about respondents' occupation, participation in the activity, and ratings of the quality, utility, and uniqueness of the activity or service. The questionnaires also include items about participants' visits to home pages and electronic databases created by the Consortia. Questionnaires were tailored for each activity category and for each activity within the category.

Draft questionnaires were reviewed by Consortia staff and ED staff. As appropriate, reviewers' comments and suggestions were incorporated into the final versions of the instruments.

Sampling Procedures

In March and April 1996, the evaluators contacted Consortium directors and other staff to identify professional development activities and active teams and networks and to determine whether individual Consortia had distributed the publication *Promising Practices in Mathematics and Science* during the past 12 months and whether they could provide a list of recipients. The general criteria for including a professional development activity in the survey sample were that it (1) represented a relatively large investment of Consortium resources, (2) was intensive, (3) included some kind of follow-up, and (4) was conducted during the current grant period. The sample of state teams includes at least one state team from each region in which a Consortium supports state teams, and for regions with large numbers of states or in which support for state teams is a signature activity, it includes more than one team. The survey sample of networks includes all but one of the active networks supported by the Consortia. The sample of recipients of the *Promising Practices* publication came from mailing lists that were readily available from five of the Consortia.

This process yielded 25 lists of participants and recipients of Consortia activities and services in three categories. Names without addresses and names of inappropriate respondents (e.g., ED staff) were deleted from the lists.

For participant and recipient lists with 70 or fewer names, surveys were sent to the entire population. For participant and recipient lists with more than 70 names, the evaluators drew a simple random sample to accommodate the differences in the numbers of participants/recipients. The one exception to this procedure is the publication recipient list provided by the Midwest Consortium, which included 1,226 names. Twenty percent of this population was sampled to obtain a sample size of 245. The evaluators chose this sample size because it brought the size of the total sample in this category to a number close to the original projection of 500 respondents in this category.

The evaluators weighted the survey data on the basis of the relationship between the sample size and total number of participants or recipients in the activity. Thus, for survey responses from participants in activities from which samples were drawn, the evaluators added data weights that are inversely proportional to the sample size and the total number of participants in the activity. For example, the survey sample included 28 of the 70 participants on the Pennsylvania State Team membership list supplied by the Mid-Atlantic Consortium. Taking the inverse proportion of the size of the sample and the population, a weight of 2.5 was assigned to responses from members of this team. The sample weights are reflected in the estimates of aggregate responses within each of the three activity categories. They are not reflected in the presentation of data on individual activities in each category.

Survey Administration and Follow-up

The evaluation team administered the surveys in two waves during May 1996. This schedule was determined by the availability of lists of potential respondents provided by the Consortia. The evaluators called all nonrespondents 2 weeks after the questionnaires were mailed to encourage them to complete and return the questionnaires as soon as possible. Most of these calls resulted in messages being left on answering machines or with people other than the respondents who took the call. In some cases, callers took responses over the phone. Copies of the questionnaires were mailed or faxed to all respondents who said that they had lost or not received the original.

After the first round of follow-up calls, the response rates for each activity and for the three activity categories were recorded. For activities with response rates at or above

70 percent after the first follow-up, there was no additional attempt to contact nonrespondents. For activities with response rates below 70 percent, there was a second round of follow-up calls. For each of these activities, follow-up efforts ended when the response rate reached 65 percent or when callers had attempted to reach each nonrespondent at least twice. Overall, the follow-up efforts yielded response rates of 65 percent or higher for 14 of the activities and overall response rates of 76 percent for professional development activities, 68 percent for teams, 72 percent for networks, and 56 percent for dissemination of the *Promising Practices* publication.

Exhibit A-1

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIA
PROFESSIONAL DEVELOPMENT ACTIVITY

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIUMS
PROFESSIONAL DEVELOPMENT ACTIVITY

Circle the number to the right to indicate your response for each question below.

1. Please indicate the type of agency for which you work: (CIRCLE ONE)

a.	School	1
b.	School district	2
c.	Intermediate education agency or BOCES	3
d.	State education agency	4
e.	Institution of higher education	5
f.	Other (specify): _____	6

2. Which of the following activities are major parts of your professional responsibilities? (CIRCLE ALL THAT APPLY)

a.	Teaching elementary or secondary school students	1
b.	Teaching undergraduate or graduate school students	1
c.	Administering local education program(s) or organization(s)	1
d.	Administering State education program(s) or organization(s)	1
e.	Providing professional development or technical assistance	1
f.	Other (specify): _____	1

3. What percent of your time is explicitly directed toward mathematics, science, or technology education? (CIRCLE ONE)

a.	Less than 25 percent	1
b.	25 to 50 percent	2
c.	More than 50 percent, but less than 100 percent	3
d.	100 percent	4

4. Did you attend the [Professional Development Activity] sponsored by the [Consortium]?

a.	Yes	1
b.	No (END SURVEY AND RETURN TO PSA)	2
c.	Unsure (END SURVEY AND RETURN TO PSA)	3

OMB No. 1880-0529. Approval expires 5/31/96. Reporting on this survey is authorized by law (20 USC 8671). Your responses will be kept strictly confidential. Results from this survey will appear in summary or statistical form only, so that individuals cannot be identified.

5. What was the extent of your involvement with the activity? (CIRCLE ONE)

a. Attended everything 1
b. Attended more than half of total 2
c. Attended less than half of total 3
d. Attended very little or nothing 4

6. What were your purposes in participating in this activity? (CIRCLE ALL THAT APPLY)

a. Generally keeping current professionally 1
b. Obtaining ideas or contacts that would strengthen my work 1
c. Obtaining ideas or contacts that would strengthen my organization's existing work 1
d. Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort 1
e. Being a resource to others 1
f. Other (specify): _____ . 1

7. How fully did the activity serve your purposes? (CIRCLE ONE)

a. It served my purposes completely 1
b. It was a good start 2
c. It was a start, but it did not provide sufficient information or guidance to enable me to follow up 3
d. It did not serve my purposes 4

8. Based on your experience, please indicate whether you think the activity is a unique resource.

a. Yes 1
b. No 2

If you answered "Yes" please elaborate briefly _____

_____

_____

9. Please indicate the type and extent of the follow up, if any, that [Consortium] staff have initiated with you. (CIRCLE ONE ON EACH LINE)

		Never	Once	More than once
a.	Followed up by phone	1	2	3
b.	Followed up with workshops, training, meetings	1	2	3
c.	Sent additional materials	1	2	3
d.	Visited my workplace	1	2	3
e.	Provided financial support	1	2	3
f.	Other (specify): _____	1	2	3

10. Please indicate the type and extent of the follow up, if any, that has been available from an organization(s) other than the [Consortium] (CIRCLE ONE ON EACH LINE)

		Never	Once	More than once
a.	Followed up by phone	1	2	3
b.	Followed up with workshops, training, meetings	1	2	3
c.	Sent additional materials	1	2	3
d.	Visited my workplace	1	2	3
e.	Provided financial support	1	2	3
f.	Other (specify): _____	1	2	3

11. Have you visited the home page or other electronic databases created by this consortium, other Eisenhower Regional Consortiums, or the Eisenhower National Clearinghouse? (CIRCLE ALL THAT APPLY)

a.	Yes, I have visited the home page and/or databases created by this consortium	1
b.	Yes, I have visited the home page and/or databases created by other regional consortiums	1
c.	Yes, I have visited the home page and/or databases maintained by the Eisenhower National Clearinghouse	1
d.	No, I have not visited any of these electronic sites, but I am aware that they exist (SKIP TO 14)	1
e.	No, I have not visited any of these sites; I did not know they existed (SKIP TO 14)	1

12. Did attending [Professional Development Activity] lead you to visit one or more of these sites?

a. Yes 1
b. No 2

13. Compared to other electronic sites you have visited, how would you rate the quality of these sites in each of the following areas? (CIRCLE ONE ON EACH LINE)

		Poor	Fair	Good	Excellent
a.	Access through the Internet	1	2	3	4
b.	Access from one site to another	1	2	3	4
c.	Format of information included at the site	1	2	3	4
d.	Usefulness of the information at the site	1	2	3	4

14. What effect has the activity had on your own work related to this topic? (CIRCLE ALL THAT APPLY)

a. It confirmed what I was already doing 1
b. I have considered doing something new in my job 1
c. I have started to try something I learned from this activity 1
d. I have incorporated something I learned from this activity into my job 1
e. I have shared the ideas with a colleague(s) 1
f. It has not had an effect on how I do my job 1
g. Other (specify): _____ . 1

15. How large a contribution to your skills and knowledge has this activity made within each of the following domains? (CIRCLE ONE ON EACH LINE)

		None	Small	Moderate	Major
a.	Mathematics/science/technology education	1	2	3	4
b.	Professional development	1	2	3	4
c.	Assessment/standard setting	1	2	3	4
d.	Planning	1	2	3	4
e.	Collaboration/communication	1	2	3	4
f.	Other (specify): _____	1	2	3	4

16. How closely is this activity related to broader (e.g., local, state, or regional) mathematics, science, and technology reform efforts with which you are familiar? (CIRCLE ONE)

a. It is closely related to broader reform efforts 1
b. It is somewhat related to broader reform efforts 2
c. It is not related to broader reform efforts 3
d. I don't know; I am not involved in broader reform efforts 4

17. What effect, if any, has the [Professional Development Activity] had on the way **your organization** does its work? (CIRCLE ONE ON EACH LINE)

	None	Small	Moderate	Major
a. Helped generate awareness of new information within the organization	1	2	3	4
b. Supported an ongoing program, policy, or practice of the organization	1	2	3	4
c. Helped the organization initiate or establish a new program, policy, or practice	1	2	3	4
d. Has not had an effect on the organization	1	2	3	4

18. Compared with other similar activities, how would you rate the quality of this one in each of the following areas? (CIRCLE ONE ON EACH LINE)

	Poor	Fair	Good	Excellent
a. Accuracy of content	1	2	3	4
b. Completeness	1	2	3	4
c. Presentation	1	2	3	4
d. Depth	1	2	3	4

THANK YOU FOR YOUR ASSISTANCE

PLEASE RETURN THIS SURVEY AS QUICKLY AS POSSIBLE, PREFERABLY WITHIN ONE WEEK, IN THE ATTACHED ENVELOPE.

Policy Studies Associates
1718 Connecticut Avenue, NW Suite 400
Washington, DC 20009
Attention: Sara Nathanson

(202) 939-9780

Exhibit A-2

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIA
TEAM OR NETWORK

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIUMS
TEAM OR NETWORK

Circle the number to the right to indicate your response for each question below.

1. Please indicate the type of agency for which you work: (CIRCLE ONE)

a.	School	1
b.	School district	2
c.	Intermediate education agency or BOCES	3
d.	State education agency	4
e.	Institution of higher education	5
f.	Other (specify): _____	6

2. Which of the following activities are major parts of your professional responsibilities? (CIRCLE ALL THAT APPLY)

a.	Teaching elementary or secondary school students	1
b.	Teaching undergraduate or graduate school students	1
c.	Administering local education program(s) or organization(s)	1
d.	Administering State education program(s) or organization(s)	1
e.	Providing professional development or technical assistance	1
f.	Other (specify): _____	1

3. What percent of your time is explicitly directed toward mathematics, science, or technology education? (CIRCLE ONE)

a.	Less than 25 percent	1
b.	25 to 50 percent	2
c.	More than 50 percent, but less than 100 percent	3
d.	100 percent	4

4. Are you a member of the [Team or Network] sponsored by the [Consortium]

a.	Yes	1
b.	No (END SURVEY AND RETURN TO PSA)	2
c.	Unsure (END SURVEY AND RETURN TO PSA)	3

OMB No. 1880-0529. Approval expires 5/31/96. Reporting on this survey is authorized by law (20 USC 8671). Your responses will be kept strictly confidential. Results from this survey will appear in summary or statistical form only, so that individuals cannot be identified.

5. What has been the extent of your involvement in the [Team or Network] activities? (CIRCLE ONE)

a. Essentially uninvolved 1
b. Available if they need me 2
c. Interested and involved in the activities 3
d. Critical to the activities' success 4

6. What were your purposes in participating in this activity? (CIRCLE ALL THAT APPLY)

a. Generally keeping current professionally 1
b. Obtaining ideas or contacts that would strengthen my work 1
c. Obtaining ideas or contacts that would strengthen my organization's existing work 1
d. Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort 1
e. Being a resource to others 1
f. Other (specify): _____ . 1

7. How fully did the activity serve your purposes? (CIRCLE ONE)

a. It served my purposes completely 1
b. It was a good start 2
c. It was a start, but it did not provide sufficient information or guidance to enable me to follow up 3
d. It did not serve my purposes 4

8. Based on your experience, please indicate whether you think the activity is a unique resource.

a. Yes 1
b. No 2

If you answered "Yes" please elaborate briefly _____

_____

_____

9. Please indicate the type and extent of the follow up, if any, that the [Consortium] staff have initiated with you. (CIRCLE ONE ON EACH LINE)

		Never	Once	More than once
a.	Followed up by phone	1	2	3
b.	Followed up with workshops, training, meetings	1	2	3
c.	Sent additional materials	1	2	3
d.	Visited my workplace	1	2	3
e.	Provided financial support	1	2	3
f.	Other (specify): _____	1	2	3

10. What effect has the activity had on your own work related to this topic? (CIRCLE ALL THAT APPLY)

a.	It confirmed what I was already doing	1
b.	I have considered doing something new in my job	1
c.	I have started to try something I learned from this activity	1
d.	I have incorporated something I learned from this activity into my job	1
e.	I have shared the ideas with a colleague(s)	1
f.	It has not had an effect on how I do my job	1
g.	Other (specify): _____	1

11. How large a contribution to your skills and knowledge has this activity made within each of the following domains? (CIRCLE ONE ON EACH LINE)

		None	Small	Moderate	Major
a.	Mathematics/science/technology education	1	2	3	4
b.	Professional development	1	2	3	4
c.	Assessment/standard setting	1	2	3	4
d.	Planning	1	2	3	4
e.	Collaboration/communication	1	2	3	4
f.	Other (specify): _____	1	2	3	4

12. How closely is this activity related to broader (e.g., local, state, or regional) mathematics, science, and technology reform efforts with which you are familiar? (CIRCLE ONE)

a.	It is closely related to broader reform efforts	1
b.	It is somewhat related to broader reform efforts	2
c.	It is not related to broader reform efforts	3
d.	I don't know; I am not involved in broader reform efforts	4

13. What effect, if any, has the activity had on the way **your organization** does its work? (CIRCLE ONE ON EACH LINE)

	None	Small	Moderate	Major
a. Helped generate awareness of new information within the organization	1	2	3	4
b. Supported an ongoing program, policy, or practice of the organization	1	2	3	4
c. Helped the organization initiate or establish a new program, policy, or practice	1	2	3	4
d. Has not had an effect on the organization	1	2	3	4

14. Have you visited the home page or other electronic databases created by this consortium, other Eisenhower Regional Consortiums, or the Eisenhower National Clearinghouse? (CIRCLE ALL THAT APPLY)

a. Yes, I have visited the home page and/or databases created by this consortium 1
b. Yes, I have visited the home page and/or databases created by other regional consortiums 1
c. Yes, I have visited the home page and/or databases maintained by the Eisenhower National Clearinghouse 1
d. No, I have not visited any of these electronic sites, but I am aware that they exist (SKIP TO 17) 1
e. No, I have not visited any of these sites; I did not know they existed (SKIP TO 17) 1

15. Has your participation on the [Team or Network] led you to visit one or more of these sites?

a. Yes 1
b. No 2

16. Compared to other electronic sites you have visited, how would you rate the quality of these sites in each of the following areas? (CIRCLE ONE ON EACH LINE)

	Poor	Fair	Good	Excellent
a. Access through the Internet	1	2	3	4
b. Access from one site to another	1	2	3	4
c. Format of information included at the site	1	2	3	4
d. Usefulness of the information at the site	1	2	3	4

17. Where does the leadership for the current [Team or Network] activities come from? (CIRCLE ONE)

a. Primarily from the Consortium 1
b. Primarily from the members 2
c. Equally balanced between Consortium and members 3
d. I don't know 4

18. Listed below are some possible contributions that a Consortium can make to a network or team. Please indicate the effect of the contributions made by [Consortium] to the work of the [Team or Network].
(CIRCLE ONE ON EACH LINE)

		Does not do	Does with no effect	Does with small effect	Does with moderate effect	Does with major effect
a.	Provided financial or other support for participants	1	2	3	4	5
b.	Convened and facilitated meetings	1	2	3	4	5
c.	Paid for the activities of the [Team or Network]	1	2	3	4	5
d.	Contributed staff time to organizing the [Team or Network]	1	2	3	4	5
e.	Produced and disseminated a [Team or Network] product	1	2	3	4	5
f.	Provided substantive advice and guidance	1	2	3	4	5

19. Please indicate which of the following represent significant outcomes of the work of the [Team or Network]. (CIRCLE ALL THAT APPLY)

a. Opened important new lines of communications 1
b. Provided a unique forum for discussing important issues 1
c. Created productive new working relationships 1
d. Developed a needed product (e.g., standards for mathematics and science education, policy options, a plan) 1
e. Supported worthwhile projects related to reforms in mathematics and science education 1
f. There were no important outcomes 1
g. Other (specify): _____ . 1

THANK YOU FOR YOUR ASSISTANCE

PLEASE RETURN THIS SURVEY AS QUICKLY AS POSSIBLE, PREFERABLY WITHIN ONE WEEK, IN THE ATTACHED ENVELOPE.

Policy Studies Associates
1718 Connecticut Avenue, NW Suite 400
Washington, DC 20009
Attention: Sara Nathanson

(202) 939-9780

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Exhibit A-3

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIA
PROMISING PRACTICES IN MATHEMATICS AND SCIENCE EDUCATION 1995

CUSTOMER SURVEY
EISENHOWER MATH AND SCIENCE REGIONAL CONSORTIUMS
"PROMISING PRACTICES IN MATHEMATICS AND SCIENCE EDUCATION 1995"

1. Please indicate the type of agency for which you work: (CIRCLE ONE)

a.	School	1
b.	School district	2
c.	Intermediate education agency or BOCES	3
d.	State education agency	4
e.	Institution of higher education	5
f.	Other (specify): _____	6

2. Which of the following activities are major parts of your professional responsibilities? (CIRCLE ALL THAT APPLY)

a.	Teaching elementary or secondary school students	1
b.	Teaching undergraduate or graduate school students	1
c.	Administering local education program(s) or organization(s)	1
d.	Administering State education program(s) or organization(s)	1
e.	Providing professional development or technical assistance	1
f.	Other (specify): _____	1

3. What percent of your time is explicitly directed toward mathematics, science, or technology education? (CIRCLE ONE)

a.	Less than 25 percent	1
b.	25 to 50 percent	2
c.	More than 50 percent, but less than 100 percent	3
d.	100 percent	4

4. Have you received "Promising Practices in Mathematics and Science Education 1995" from the [Consortium]?

a.	Yes	1
b.	No (END SURVEY AND RETURN TO PSA)	2
c.	Unsure (END SURVEY AND RETURN TO PSA)	3

OMB No. 1880-0529. Approval expires 5/31/96. Reporting on this survey is authorized by law (20 USC 8671). Your responses will be kept strictly confidential. Results from this survey will appear in summary or statistical form only, so that individuals cannot be identified.

5. What was the extent of your use of the document? (CIRCLE ONE)

a. Read everything 1
b. Read more than half of total 2
c. Read less than half of total 3
d. Read very little or nothing 4

6. What were your purposes in looking at this document? (CIRCLE ALL THAT APPLY)

a. Generally keeping current professionally 1
b. Obtaining ideas or contacts that would strengthen my work 1
c. Obtaining ideas or contacts that would strengthen my organization's existing work 1
d. Obtaining ideas or contacts that would help my organization carry out a major, planned improvement effort 1
e. Being a resource to others 1
f. Other (specify): _____ . 1

7. How fully did the document serve your purposes? (CIRCLE ONE)

a. It served my purposes completely 1
b. It was a good start 2
c. It was a start, but it did not provide sufficient information or guidance to enable me to follow up 3
d. It did not serve my purposes 4

8. Based on your experience, please indicate whether you think the document is a unique resource.

a. Yes 1
b. No 2

If you answered "Yes" please elaborate briefly _____

_____

_____

9. Please indicate the type and extent of the follow up, if any, that the [Consortium] staff have initiated with you. (CIRCLE ONE ON EACH LINE)

		Never	Once	More than once
a.	Followed up by phone	1	2	3
b.	Followed up with workshops, training, meetings	1	2	3
c.	Sent additional materials	1	2	3
d.	Visited my workplace	1	2	3
e.	Provided financial support	1	2	3
f.	Other (specify): _____	1	2	3

10. Have you visited the home page or other electronic databases created by this consortium, other Eisenhower Regional Consortiums, or the Eisenhower National Clearinghouse? (CIRCLE ALL THAT APPLY)

a. Yes, I have visited the home page and/or databases created by this consortium 1
b. Yes, I have visited the home page and/or databases created by other regional consortiums 1
c. Yes, I have visited the home page and/or databases maintained by the Eisenhower National Clearinghouse 1
d. No, I have not visited any of these electronic sites, but I am aware that they exist (SKIP TO 17) 1
e. No, I have not visited any of these sites; I did not know they existed (SKIP TO 17) 1

11. Did receiving "Promising Practices in Mathematics and Science Education 1995" lead you to visit one or more of these sites?

a. Yes 1
b. No 2

12. Compared to other electronic sites you have visited, how would you rate the quality of these sites in each of the following areas? (CIRCLE ONE ON EACH LINE)

		Poor	Fair	Good	Excellent
a.	Access through the Internet	1	2	3	4
b.	Access from one site to another	1	2	3	4
c.	Format of information included at the site	1	2	3	4
d.	Usefulness of the information at the site	1	2	3	4

13. What effect has the document had on your own work related to this topic? (CIRCLE ALL THAT APPLY)

a. It confirmed what I was already doing 1
b. I have considered doing something new in my job 1
c. I have started to try something I learned from this activity 1
d. I have incorporated something I learned from this activity into my job 1
e. I have shared the ideas with a colleague(s) 1
f. It has not had an effect on how I do my job 1
g. Other (specify): _____ . 1

14. How large a contribution to your skills and knowledge has this document made within each of the following domains? (CIRCLE ONE ON EACH LINE)

		None	Small	Moderate	Major
a.	Mathematics/science/technology education	1	2	3	4
b.	Professional development	1	2	3	4
c.	Assessment/standard setting	1	2	3	4
d.	Planning	1	2	3	4
e.	Collaboration/communication	1	2	3	4
f.	Other (specify): _____	1	2	3	4

15. How closely is this activity related to broader (e.g., local, state, or regional) mathematics, science, and technology reform efforts with which you are familiar? (CIRCLE ONE)

a. It is closely related to broader reform efforts 1
b. It is somewhat related to broader reform efforts 2
c. It is not related to broader reform efforts 3
d. I don't know; I am not involved in broader reform efforts 4

16. What effect, if any, has the document had on the way **your organization** does its work? (CIRCLE ONE ON EACH LINE)

		None	Small	Moderate	Major
a.	Helped generate awareness of new information within the organization	1	2	3	4
b.	Supported an ongoing program, policy, or practice of the organization	1	2	3	4
c.	Helped the organization initiate or establish a new program, policy, or practice	1	2	3	4
d.	Has not had an effect on the organization	1	2	3	4

17. Compared with other similar documents, how would you rate the quality of this one in each of the following areas? (CIRCLE ONE ON EACH LINE)

	Poor	Fair	Good	Excellent
a. Accuracy of content	1	2	3	4
b. Completeness	1	2	3	4
c. Presentation	1	2	3	4
d. Depth	1	2	3	4

18. Following your review of the document, how many of the promising practices sites did you contact to request additional information? (CIRCLE ONE)

a. None 1
b. 1 - 5 sites 2
c. 6 - 10 sites 3
d. 11 - 15 sites 4
e. More than 15 sites 5

19. Which of the following best describes your experiences when you contacted the promising practices sites to request additional information? (CIRCLE ONE)

a. There is little or no additional information available 1
b. I was able to get information, but it was not very useful 2
c. I was able to get a variety of useful information 3
d. Other (specify): _____ . 4

THANK YOU FOR YOUR ASSISTANCE

PLEASE RETURN THIS SURVEY AS QUICKLY AS POSSIBLE, PREFERABLY WITHIN ONE WEEK, IN THE ATTACHED ENVELOPE.

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Washington, DC 20009
Attention: Sara Nathanson

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Appendix B
PROGRAM INDICATORS

Goal: **To contribute to the improvement of mathematics and science education by (1) providing technical assistance to support implementation of teaching methods and assessment tools, (2) disseminating exemplary mathematics and science education instructional materials, and (3) coordinating resources for improving mathematics and science education**

Objective	Indicator	Source and Next Update	Strategies
Technical Assistance			
1. Provide high-quality technical assistance. ***(Includes planning assistance, technical assistance, and training.)***	**1.1 Alignment with standards.** The content of consortia technical assistance will be explicitly aligned with high content and performance standards and/or will be focused on assisting in the implementation of high standards and practices related to their attainment.	1.1 Consortium reports, 1998, 1999, 2000; External evaluation, 1999, 2000 *(The first external evaluation of the regional consortiums program will be completed in fall 1997. The Office of Educational Research and Improvement (OERI) anticipates that the second external evaluation will begin in early1998 and that the first interim report will be completed in summer 1999. The second external evaluation will be organized around the indicators and is expected to include tracer studies and customer surveys of a sample of consortia activities.)*	• The ED program office will work with the Department's initiatives leadership teams and Executive Management Council and with the National Science Foundation to develop and implement integrated plans for work in mathematics and science education. • The ED program office will work with the consortia and professional organizations such as the National Council of Teachers of Mathematics (NCTM) and the National Science Teachers Association (NSTA) to align efforts for state and local mathematics and science education with high content and student performance standards. • With the advice and guidance of their regional boards, the consortia shall set priorities for technical assistance activities in their regions. • The consortia shall work collaboratively with regional clients and/or recipients to plan continuing technical assistance activities that meet their needs and to align technical assistance with appropriate national, state, and/or local standards.

Objective	Indicator	Source and Next Update	Strategies
Technical Assistance			
	1.2 Intensity of technical assistance. At least 60 percent of consortia technical assistance activities will be 12 hours or more. *(The projected percentage is based on data from the Cross-Consortium Descriptive Data System [CCDDS]. This target and all others under other indicators will be reassessed and revised, as appropriate, to reflect changes in program priorities and/or funding levels.)*	1.2 CCDDS, 1998, 1999, 2000	• The consortia shall document lessons learned and use findings to improve technical assistance (e.g., improve content, increase or decrease level of intensity, alter format).
	1.3 Improvements in participants' practice. Teachers, administrators, and providers of professional development who participate in the consortia's continuing technical assistance will report improvements in their practice, including the ability to meet the educational needs of at-risk, underrepresented, and/or underserved students.	1.3 Customer surveys, 1999, 2000; External evaluation (1999, 2000) *(Additional resources and/or reallocation of current resources will be necessary to support administration of customer surveys. Surveys will be administered to random samples of participants in consortia activities.)*	
	1.4 Improved student performance. At least 80 percent of teachers who participate in the consortia's continuing technical assistance will report improvements in student engagement and/or student performance.	1.4 Customer surveys, 1999, 2000; External evaluation, 1999, 2000	

Objective	Indicator	Source and Next Update	Strategies
Technical Assistance			
	1.5 Improved student performance in sites that receive intensive assistance from consortia. Assessment scores (e.g., on classroom assessments, on state and local assessments) of students who have been enrolled for at least one year in a mathematics and science program will show improvement. *(Consortia define "intensive site" in different ways [e.g., in terms of anticipated outcomes, duration and intensity of services]. This indicator refers to improvements in student performance in any site designated as intensive by individual consortia.)*	1.5 Consortia reports, 1999, 2000; Available school district records, 1998, 1999, 2000	

Objective	Indicator	Source and Next Update	Strategies
Technical Assistance			
2. Provide continuing technical assistance to individuals (a) who will assist or train others and/or (b) who will work with at-risk, under-represented and/or underserved populations.	**2.1 Participation by individuals who will assist or train others.** At least 80 percent of participants in consortia's trainer of trainers activities will go on to provide professional development or technical assistance to others based on the technical assistance they received from the consortia.	2.1 Customer surveys, 1999, 2000; CCDDS, 1998, 1999, 2000; External evaluation, 1999, 2000	• The ED program office will work with the Office of Elementary and Secondary Education's (OESE) Eisenhower state and local program (Part B) to develop strategies to align consortia activities with needs identified in needs assessment plans required of each state and local education agency.
	2.2 Participation by educators who work with at-risk, underrepresented and/or underserved populations. At least 70 percent of the district and school staff who participate in consortia's continuing technical assistance will work in districts or schools serving significant numbers of at-risk, underrepresented, and/or underserved students. *("At-risk", "underrepresented", and "underserved" will be defined and reported in categories including, but not necessarily limited to, Title I students, Native American students, and students, and students with limited English proficiency.)*	2.2 Consortia reports, 1998, 1999, 2000	• The ED program office will continue to facilitate identification of critical needs for assisting schools with historically underrepresented populations. • With the advice and guidance of their regional boards, the consortia shall prepare and implement a strategic plan to identify and recruit individuals and organizations who will assist or train others in mathematics and science education and/or who work with at-risk, underrepresented, and/or underserved students. • The consortia shall document lessons learned about strategies to target potential participants in technical assistance activities and use findings to improve targeting (e.g., improve identification of potential participants, improve "marketing" of activities).

Objective	Indicator	Source and Next Update	Strategies
Dissemination			
3. Identify promising and exemplary practices in mathematics and science education.	**3.1 Promising and exemplary practices.** The consortia will identify promising and exemplary practices in mathematics and science education in their regions to be considered for inclusion in regional and/or national dissemination systems. *(The consortia anticipate that the total number of promising and exemplary practices will increase but that the rate of increase will vary over time. Determination of estimates or numbers of practices to be identified will depend on the results of pilot tests of standards and guidelines for identifying exemplary and promising practices.)*	3.1 Consortia/Eisenhower National Clearinghouse (ENC) reports, 1998, 1999, 2000; External evaluation, 1999, 2000	• The ED program office will work with OERI and the Department to develop, implement, and disseminate standards and guidelines for identifying promising and exemplary practices. • In collaboration with the ENC and OERI and based on standards and guidelines developed by OERI's Mathematics and Science Education Expert Panel, the consortia shall develop and implement a plan for identifying exemplary and promising practices.

Objective	Indicator	Source and Next Update	Strategies
Dissemination			
4. In coordination with the ENC, disseminate information about promising and exemplary practices in mathematics and science education.	**4.1 Communicate information.** The consortia will communicate information about promising and exemplary practices to OERI and the ENC, and increasing amounts of this information will be accepted for and included in their databases.	4.1 Consortia/ENC reports, 1998, 1999, 2000	• The ED program office will work with the consortia and ENC to develop comprehensive strategies for disseminating products to target audiences, tracking use of products, and obtaining customer feedback to ensure that the products are used effectively to improve mathematics and science education. • The ED program office will work with OERI, the Department, the consortia, ENC, and others to develop strategies for disseminating information about lessons learned from the Third International Mathematics and Science Study (TIMSS). • The ED program office will create an Eisenhower Program home page linked to the web sites of the consortia, the ENC, and other Eisenhower projects. • With the advice and guidance of their regional boards, the consortia shall prepare and implement a strategic outreach plan to identify target audiences and their specific needs for consortia/ENC products (e.g., print materials, electronic databases). • The consortia shall use customer feedback to ensure that products disseminated by the consortia and ENC meet customer needs and to improve the content and format of products.
	4.2 Customer requests. The number of requests for products available through the consortia and ENC and "hits" on electronic sites will increase annually.	4.2 Consortia/ENC reports, 1998, 1999, 2000; CCDDS, 1998, 1999, 2000	
	4.3 Utility. A majority of the recipients of consortia and ENC products and resources will report that the products have contributed to improving their work. *(The projected percentage of recipients is based on findings from the national evaluation of the regional consortiums program. "Recipients" include individuals who report receiving consortia and ENC products and resources.)*	4.3 Customer surveys, 1999, 2000; External evaluation, 1999, 2000	

Objective	Indicator	Source and Next Update	Strategies
Coordination of Resources			
5. Contribute to collaboration and networking with targeted groups within and/or across states.	**5.1 Volume of collaboration.** At least 80 percent of consortia activities will include collaborators from one or more stakeholder groups in planning, product development, and/or service delivery. **5.2 Impact on collaboration and networking.** At least 80 percent of members of consortia teams and networks will report that value was added in one or more of the following ways: strengthening relationships; increasing service coordination; increasing their access to resources; or leveraging resources for greater impact on their clients. *(The projected percentage of members of consortia teams and networks is based on findings from the national evaluation of the regional consortiums program.)*	5.1 CCDDS, 1998, 1999, 2000; Consortia reports, 1998, 1999, 2000; External evaluation, 1999, 2000 5.2 Customer surveys, 1999, 2000; External evaluation, 1999, 2000	• The ED program office will continue to facilitate collaboration among other program offices, the consortia, and ENC. • With the advice and guidance of their regional boards, the consortia shall prepare and implement a strategic outreach plan to identify key stakeholders and stakeholder organizations and to solicit their collaboration in consortium activities. • The consortia shall document participation and impact of collaboration and use findings to improve coordination of resources, including identification of key stakeholders.

Objective	Indicator	Source and Next Update	Strategies
Coordination of Resources			
6. Contribute to the use of informal education entities (e.g., science technology centers, museums, libraries, Saturday academies, 4H programs).	**6.1 Partnerships.** Representatives of at least 80 percent of the informal education entities that have entered into partnership with the consortia will report that these partnerships have added value in one or more of the following ways: better alignment of their programming with high standards, improved relationships with schools and school districts, and/or increased use of their organization and resources. *(Partnerships with informal education entities vary in terms of intensity, duration, and specific contributions made by the consortia.)*	6.1 Consortia reports, 1998, 1999, 2000; Customer surveys, 1999, 2000; External evaluation, 1999, 2000	• The ED program office will contribute to public understanding of the need for challenging academic standards and high-quality professional development by assisting grantees, states, professional organizations, and other ED partners, such as informal education entities, in disseminating information on standards-based reform. • With the advice and guidance of their regional advisory boards, the consortia shall prepare and implement a strategic outreach plan to identify high-quality informal education entities that are likely to be resources for efforts to improve mathematics and science education. • The consortia shall provide linkages and facilitate access to informal education entities by mathematics and science educators, their students, and families.

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