DOCUMENT RESUME

ED 378 244 TM 022 633

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TITLE "Whose Knowledge Is It?: Involving Teachers in the Generating and Using of Information on Educational Innovations." Working Paper.
INSTITUTION Campbell-Kibler Associates, Groton, MA.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 10 Jul 94
NOTE 39p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Computer Networks; *Data Collection; *Educational Innovation; Educational Research; Elementary School Teachers; Elementary Secondary Education; *Feedback; Government Role; Information Dissemination; *Information Networks; Knowledge Level; National Programs; Program Implementation; Psychological Patterns; Secondary School Teachers; Teacher Participation; *Teacher Role; Technological Advancement
IDENTIFIERS Teacher Empowerment

ABSTRACT

This is the second of four working papers on dissemination policies, commissioned in 1993 by the Office of Educational Research and Improvement. It is intended to stimulate discussion and the exchange of insights on the government's role in empowering educators to contribute to the evaluation of innovations they use to improve education. Traditionally, information has been shared in education through feedback to the teacher, and the useful information teachers can provide about the implementation and impact of innovations has often been ignored. This report describes and analyzes key types of strategies as well as technical and psychological issues in establishing strategies to develop a systematic national education dissemination system. In addition, several consumer evaluation options are presented. The growth of electronic networks has the potential to make a model of two-way communication and information-sharing possible. While the technical challenges of setting up such a system are not great, the societal and psychological challenges of regarding the teacher, student, and policy maker as a customer are large. A possible model of an information feedback system and the types of information it could collect are presented. An appendix contains some key contacts. (Contains 36 references.) (SLD)

Working Paper

"Whose Knowledge Is It?: Involving Teachers in the Generating and Using of Information on Educational Innovations"

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Office of the Assistant Secretary
Office of Educational Research and Improvement
U.S. Department of Education

July 10, 1994 Version

Note from The Office of Educational Research and Improvement, OERI

This working paper, **"Whose Knowledge Is It?: Involving Teachers in the Generating and Using of Information on Educational Innovations"** was prepared by Dr. Patricia B. Campbell for Dr. Sharon P. Robinson, Assistant Secretary of the Office of Educational Research and Improvement, OERI at the suggestion of Dr. Laurence Peters. This paper was prepared under Education Department Purchase Order 43-3JAJ-3-01053 for $2,450. Individuals undertaking such projects are encouraged to express freely their professional judgment. This report, therefore, does not necessarily represent positions or policies of the U.S. Department of Education, and no official endorsement should be inferred.

This is the second of four working papers on dissemination policies commissioned in September 1993 by OERI. The other three topics are (1) "A Matter of Consensus" on using R&D based evidence to develop consensus on establishing R&D agendas and deciding what is worth disseminating (Dr. Lois-ellin Datta); (2) "Readiness for Change, Educational Innovations, and Education Reform" (Dr. Thomas E. Backer); and (3) the role of technical assistance centers in promoting education R&D solutions (Drs. Brenda Turnbull and Mary Leighton).

This working paper is intended to stimulate discussion and the exchange of insights on the government's role in empowering educators to contribute to the evaluation of innovations that they use to improve education. We encourage you to request copies or share reactions and additional information with OERI project officer,

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ACKNOWLEDGEMENTS

This paper could not have been done without the assistance of a number of people including:

Dr. Susan Klein, Project Officer, who was helpful and insightful throughout the process.

Dr. Ken Komoski of Educational Products Information Exchange (EPIE) who shared his extensive knowledge willingly.

Mr. Tom Kibler of Symmetrix who reviewed the recommendations for technical feasibility.

Ms. Jennifer Storo of Campbell-Kibler Associates who assisted in the literature search and interviews.

Dr. Lois-ellin Datta of Datta Analysis and OERI staff, Dr. Barbara Leib and Ms. Carol Chelemer whose reviews helped to shape the final paper.

The many individuals, in and out of education who were willing to talk about their experiences with feedback systems.

WHOSE KNOWLEDGE IS IT? INVOLVING TEACHERS IN THE GENERATING AND USING OF INFORMATION ON EDUCATIONAL INNOVATIONS

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Foreword: "Whose Knowledge Is It?" Putting Teacher Feedback on Education Innovations in Context

by
Susan S. Klein, Ed.D, U.S. Department of Education

This visionary report by Patricia Campbell was commissioned by the Office of Educational Research and Improvement (OERI) in the U.S. Department of Education (ED) to guide the implementation of its new legislation, the "Educational Research, Development and Dissemination Improvement Act of 1994" in Title IX of Goals 2000. Thus, opportunities for improving the federal role in education research and development (R&D) provide the primary **context** for this examination of "Whose Knowledge Is It?: Involving Teachers in the Generating and Using of Information on Educational Innovations".

One of the weak links in the education R&D system has been the limited involvement of teachers and other consumers in research and evaluation to improve what they and others are doing on an ongoing basis. OERI has started to provide leadership in this area by sponsoring a national "Invitational Conference on Teacher-led Inquiry" and by funding research on involving teachers in their own evaluation as well as the evaluation of their students. This report is an attempt to examine a related, but somewhat different way for ED to help our nation expand its use of teachers' expertise. It is designed to examine how teachers' experiences with specific innovations can be shared systematically with other teachers who are in a position to decide if and how they will use the innovation. This strategy involves both top-down and bottom-up leadership. From the top-down, the federal government can establish or foster the development of systems that will compile, synthesize and interpret teacher evaluations of specific products and programs to provide consumer information to other teachers on what works best. From the bottom-up, the teachers can be empowered by feeding back their evaluations based on their own experiences with the innovations to educators outside of their school and directly contributing their wisdom to educational improvement across the nation.

Three forces are currently operating to make Dr. Campbell's approach to this challenge feasible. They include:

- **A new legislative mandate for the U.S. Department of Education**

  Increasing the nation's knowledge of what's promising and exemplary in the treasure chest of R&D based resources is a critical element in the 1994 reauthorization of OERI. This responsibility is given to OERI's new Office of Reform Assistance and Dissemination as well as to each of its five new Institutes. Congress wants OERI to provide leadership in more systematically identifying and sharing the best from the nation's treasure chest of educational products, programs

and practices. Members of Congress such as Representative Major Owens, chair of the subcommittee which had the most responsibility for the reauthorization of OERI, have been concerned about the limited systematic collection and use of feedback from teachers on what educational innovations work well or poorly for them and their students. To remedy this omission, OERI is now authorized to:

> *(A) create a national system of dissemination, development, and educational improvement in order to create, adapt, identify, validate, and disseminate to educators, parents, and policymakers those educational programs that have potential or have been shown to improve educational opportunities for all students; and*
>
> *(B) empower and increase the capacity of teachers to participate in the research and development process.*

(U.S. Congress, 1994, Goals 2000: Educate America Act, Title IX, Part D, National Education Dissemination System, Sec. 941 (2) Purpose, p. 125).

This is to be accomplished through electronic networking and new technologies and through the auspices of the Educational Resources Information Center (ERIC) Clearinghouses, the regional educational laboratories, the Teacher Research Dissemination Demonstration Program, the Goals 2000 Community Partnership Program, the existing National Diffusion Network, the Institutes and other appropriate programs or activities.

- **Increased Availability of Computers and Electronic Mail**

  Educators are relying on computers to help them keep track of all kinds of descriptive and evaluative information and increasing numbers of schools are using computer modems to connect with others outside their buildings. Thus, it is much easier than before to collect a continuous flow of evaluation information from teachers across the nation and to share the cumulative results with other educators. Dr. Campbell has emphasized these advances in technology in her examination of the issues and possibilities for federal leadership in using teacher feedback.

- **The ability to build on substantial national experience in educational evaluation to develop new approaches to understand the comparative strengths and weaknesses of numerous R&D-based resources**

  Although most previous evaluations have been more likely to focus on the identification of weaknesses and needs rather than comparative strengths of viable

solutions, the nation can capitalize on the increased numbers of trained evaluators as well the general research and evaluation skills of teachers and administrators. In addition to evaluating their students, many teachers have participated in pilot evaluations of instructional materials and in federally funded accountability evaluations to show that federal programs are doing what they said they would. And as we mentioned earlier, there is also renewed interest in having teachers conduct classroom research. Sharing specific evaluative feedback on programs or products that they and many other teachers use is one way to build on these capacities for inquiry and improvement. Professional evaluators and teachers with evaluation experience and interests can help make it feasible to implement a system like what Dr. Campbell has started to design.

However, new evaluation systems, incentives and roles for teachers and others also will be needed. With some notable exceptions such as the Department of Education's Program Effectiveness Panel (PEP) which selects programs for ED's National Diffusion Network (NDN) and the work of the Educational Products Information Exchange (EPIE), evaluations have rarely been used on an ongoing basis or to help consumers make informed decisions about the strengths and weaknesses of their product or program options. The role of the federal government in evaluating what they and others fund to guide future federal investments in dissemination is discussed in a recent special feature of *Evaluation and Program Planning* on "Sharing the best: Finding better ways for the federal government to use evaluation to guide the dissemination of promising and exemplary education solutions" (Klein, 1994). One of the recommendations from these analyses is for the Department of Education to develop ways to empower teachers and other educators to contribute to ongoing evaluations of promising and exemplary products, programs and practices for both revision and dissemination purposes. Dr. Campbell's report addresses this recommendation.

In this report Dr. Campbell has:

1. Helped us understand aspects of the current national R&D information sharing system which provide fragmented feedback on the value of alternative R&D-based education solutions or innovations to education practitioners, researchers and policymakers. In doing so, she has identified many gaps and potential areas for improvement.

2. Identified many challenges that will face us as the federal government changes its focus and treats teachers and others responsible for selecting and using the best R&D materials and programs as wise contributors and consumers of their own evaluation expertise.

3. Generated creative options for OERI to consider in developing more systematic feedback systems to capture and share teacher wisdom about strengths and

weaknesses of the innovations they have tried.

Dr. Campbell has unique qualifications to help OERI start its work in designing this comprehensive teacher feedback system. She has been a professor, product developer, researcher, and professional evaluator working at all levels of education in her distinguished career spanning more than 25 years. Her specific expertise in using technology in education and promoting equity have also been incorporated in many aspects of the design specifications.

However, due to the limited OERI funding ($2,450) for this project and the related fairly narrow scope of work, none of us view this as the final comprehensive design or even a total list of design options. Instead, Dr. Campbell has provided us with a valuable "jump start". OERI will need to build on this initial work to design this component of its new and more comprehensive national education dissemination system. Specifically, OERI will need to give more thought to including these educator feedback and sharing functions as it: (a) develops new internal procedures to identify and share the best and (b) funds old and new components of the National Education Dissemination system (such as ERIC and The Teacher Research Dissemination Demonstration Program).

The following list is intended to add to the many insights from Dr. Campbell's report, but it is certainly not the definitive set of issues relating to this complex, but important topic.

- **We may need to pay more attention to the complexity of what is to be evaluated and shared with other education consumers.**

  This report focuses on innovations, but doesn't suggest how the system designers might think about how to handle obtaining or using the evaluation feedback on the different forms of these innovations. These innovations range from:

  - practices or ideas (such as cooperative learning) which are often based on insights from research and/or repeated experiences of practitioners to
  - transportable products or instructional materials to
  - complex multi-dimensional programs which are likely to be adapted and somewhat transformed by each user, rather than adopted and replicated exactly as the initial developer may have intended.

  It also doesn't discuss the complex "interaction" effects connected with using these innovations along with other innovations. Nor does it discuss the effects of using the innovations in different types of user contexts such as with student populations, teachers or school organizations that differ from the initial innovation design context.

- **We need to expand Dr. Campbell's examination of the role of the decision makers in collecting and using evaluative information on the strengths and weaknesses of the multiple innovations that generally exist to address similar needs.**

  Thus, we will need to learn more about if and how system users will:

  - use "raw" grassroots feedback on evaluations of individual resources from databases
  - use interpretive syntheses of the feedback on each resource
  - use consumer report types of documents where experts compare the strengths and weaknesses of multiple products designed to help with the same educational challenge. For example, in dealing with some complex topics (such as alternative programs to help teachers learn to treat their students fairly) should OERI fund the development of interpretive consumer reports to help potential users analyze their own needs and understand why experts used certain criteria to rate the program options?

- **We need additional examination of technical/procedural options such as:**

  - the value and cost effectiveness of sampling specific types of users (rather than collecting feedback from all volunteers) or
  - collecting and analyzing group or qualitative evaluation feedback such as convening focus groups in person (or via electronic networking or teleconferences) as well as the more mechanistic quantitative information which can be compiled automatically using pre-prepared computer software.
  - collecting and sharing evaluative information: (a) from students, parents, administrators and others who might become direct participants in this consumer information exchange system, rather than participating through specific teachers or other dissemination "linkers" and (b) on the impact of the innovation on those involved. Dr. Campbell agrees that it is important to involve students and student evaluators, and parents and to obtain student and parent impact information to include along with other teacher provided evidence to support their evaluations of specific innovations. In earlier drafts she also suggested involving students' networks such as KidsNet.

- integrating a computer based system to evaluate specific innovations with other teacher, school, state, or national level evaluation and information systems and requirements such as EPIE, the Goals 2000 reforms developed at the federal and state levels, and the state curriculum framework efforts funded by the Eisenhower Program.

- **Assuming that we are unlikely to move quickly from current fragmented feedback and sharing activities to one national model, we need to know more about how existing or planned entities could serve as collectors and distributors of the evaluative information. We also need more advice on how OERI can make specific changes in the dissemination and R&D programs it administers to build toward the more unified model suggested by Dr. Campbell.**

  Increased insights in these areas are particularly important for ED funded components of the national education dissemination system. For example, what is the current role of ED technical assistance centers? As technical assistance centers are redesigned, what part of this feedback system would make the best use of these centers' expertise and contacts? How should ED offices operate their funding of national demonstration programs to obtain useful comparative information on different approaches designed to accomplish similar goals?

- **We need to know how ideal model feed back and sharing systems could be operated cost-effectively.**

  Is there any evidence that volunteers and students can help reduce costs of such a system, particularly for the synthesis and interpretation roles? What advances in technology are likely to make the operations of an integrated feedback and consumer information system feasible?

- **We need to know more about the implications for changing the power balance by having teachers play a greater role in evaluating what they use and in selecting the best options that their resources will allow.**

  Dr. Campbell provided a good initial discussion of how the system could provide incentives for teachers to participate. But additional discussion is needed on how this new function will use teachers' valuable time, how it might make them more reflective and effective teachers, how it will relate to their increased school management responsibilities, or how they might become more vulnerable to

influence by publishers or others who provide incentives for "good" reviews of their products.

We should also explore ideas on how this feedback system could help provide a clear function for networks or communities of learners (including researchers, developers, administrators, teachers, community members) with similar areas of expertise such as multi-cultural education or physics.

In summary, we hope that this working paper will stimulate your creative thinking so that you will help OERI decide how to best use federal leverage points to obtain and share systematic evaluative feedback from teachers and education consumers on the products and programs that are such an important part of their daily lives.

WHOSE KNOWLEDGE IS IT?: INVOLVING TEACHERS IN THE GENERATING AND USING OF INFORMATION ON EDUCATIONAL INNOVATIONS

By
Patricia B. Campbell, Ph.D., Campbell-Kibler Associates

The traditional rule is that researchers only talk and teachers only listen (Campbell et al, 1988).

I. INTRODUCTION

In an effort to change that rule, the Office of Educational Research and Improvement (OERI) of the Education Department commissioned a report to "guide OERI in the development of support and incentive strategies to obtain, synthesize, and share evaluative information on R&D based solutions including products, programs, and practices." Along with describing and analyzing key types of strategies and technical and psychological issues, the report provides several consumer evaluation options for OERI to consider as it develops a more systemic national education dissemination system.

The report grew out of a literature search, interviews with people involved in feedback systems and electronic networking systems and a "brainstorming" seminar with OERI staff. Information was obtained from varied sources outside of education from Amnesty International to Texas Instruments. All technical recommendations were reviewed for feasibility by an expert in databases and networking.

II. INFORMATION SHARING: OLD MODELS AND NEW

With the exception of a few formal field test situations usually operated by a developer, there is little opportunity for educators to systematically share information with each other, and with developers and decision makers, about what R&D based solutions work best in different circumstances. Yet this information is key if we are going to do a better job in identifying and sharing the best in education. Now, for a variety of reasons including the push to national standards, technological advances and even the interest of Congress, is the time to be able to improve our answers to the question of "What is best?" (Klein, 1993).

Current Models of Information Sharing In Education

In most research and evaluation the role of the teacher is clear. Theoretically, in return for serving as a subject, or allowing one's students to serve as subjects, the teacher

receives the results of the research or development effort and can use those results to improve practice and benefit students. Seen in research and development as client, teachers are viewed as "the passive recipients of someone else's knowledge: rather than as sources of knowledge themselves or active participants in their own growth and development" (Darling-Hammond et al, 1993, p. 4). Neither are they seen as active, informed consumers who make wise choices from available solutions.

Based on a deficit approach, even in this ideal model, the feedback goes only one way.

Researchers/Developers -----> Teachers -----> Students.

Usually there is even less communication than this. Glennan (1978, quoted in Buckley and Schubert, 1983) found a "persistent hostility exists between the practitioner community and the research community which makes it difficult for communications to occur between them." The teacher rarely receives results, hardly ever applies any results that are received and even less often provides information on the application of the results. Students, traditionally seen as the receivers of knowledge play even less of a role in this process although they are ultimately the most important component of education. For almost three decades the Educational Product Information Exchange (EPIE) has been trying to change this, arguing for learner feedback on instructional materials. For a short time (1974-78) there was legislation in California and Florida which mandated this. EPIE continues to call for Learner Enhanced Assessment of Products and has recently launched a pilot project to gather such learner enhanced assessments of electronic learning resources. If the pilot succeeds, the process will be applied by the States Consortium for Improving Software Selection (SCISS) which is managed by EPIE (Komoski, 1994).

The model is somewhat different for researchers/developers and policy makers. Ideally researchers/developers provide results and products to policy makers to suggest programs, define problems and generally improve education. Policy makers primarily through funding/appropriation decisions provide feedback to researchers/developers on what they want to be done.

Although realistically many other variables intervene (i.e. politics, researcher inability to communicate results to policy makers, policy makers' unwillingness to hear bad news), this is at least a model that acknowledges the importance of ongoing communication and two way feedback between researchers/developers and policy makers. Within both of these models the responses of the key players in the successful, and unsuccessful, implementation of any innovation, teachers and students, are lost. "In practical terms this has meant that those with the most direct influence on children's

learning outside the home -- namely teachers -- have had little if any voice or influence on the policies that define the limits and to some extent the very content of their teaching" (Fruchter and Price, 1993 p. 60).

Yet teachers have a tremendous amount of useful information about the implementation and impact of innovations including:

- information on the ease of use including the amount of preparation time and ease of access to materials as well as necessary costs and resources
- the degree to which the innovation fits into the existing curriculum and the school culture
- student response including student behavior, student remarks, student interest/motivation and student achievement (i.e. test scores, quality of projects).

There is much important teacher and student generated information waiting to be tapped -- information that can be used by teachers, administrators and policy makers in their decision making processes as well as by researchers and developers. And as this information is accessed and used, it has the potential to encourage teachers to generate and use additional information supporting a collaborative model of teaching based on notions of teachers as colleagues engaged in inquiry about practice (Darling-Hammond et al, 1993).

This role of teachers as reflective generators and users of information on innovation and on innovation strategies is a new one for many in education, yet it is a role that is key to educational reform and one that is coming. Indeed thinking systematically about practice, learning from experience and being members of learning communities compose two of the five core propositions of the National Board for Professional Teaching Standards (no date). It is seen as a basic requirement of the second wave of school reform (Myers, quoted in Darling Hammond et al, 1993) and even a teacher duty.

As valuable as having teachers play this role is, it does require a change. Teachers traditionally are "tinkerers operating independently...[relying] more on personal practical knowledge than on interaction with peers" (Cousins et al, 1993). Teachers often have concerns about giving or receiving assistance or even information because of a fear of being seen as less competent or inferring that another teacher might be less than competent (Cousins et al, 1993). But they need to receive information and others need to receive their information.

A New Model

A system is needed that collects information on teacher/student responses to educational innovations and provides cumulative information to researchers, developers, policy makers and teachers. Such a system would provide information in formats useful to:

- teachers and others considering adopting the innovation (teachers need to know what other teachers are saying. They are much more apt to believe teachers saying it works and it won't make you crazy -- or that it will -- than they are others).
- policy makers (policy makers need to know if it, whatever it is, is working or not, at school and district levels as well as in general).
- developers (developers need to know what needs to be refined in existing innovations and what new things need to be developed).

Such as system would also let user/participants know how their information is being used.

The model for this type of feedback is quite different from those previously listed.

	---->		
Teacher/User		Data Compiler	<----> Original Researcher/Developer
	<----		<----> Other Developers (can use the information when they develop their own products)
			<----> Policy Makers
			<----> Other Teachers (can become teacher/users)
			<----> Students (will generally use through their teachers)

In this model teachers and others using an innovation, which may include policy makers, students and parents, provide feedback to a data compiler which may be electronic network based, 800 number based or paper/fax/mail based. The data compiler provides summaries of the data from teacher/other users of a specific innovation or product in different formats to four populations. Those who use information from such a system are provided incentives which might include priority access or a reduction in fees, or to provide information to such a system thus expanding the pool of users/providers and information. While the model may be national in scope, it may also be regional, state, or interest group wide. For example, Komoski (1994) has proposed a feedback network for the national network of

community computer centers under *Playing to Win* and Palanki (1993) has concluded that collecting information about best practices at the local level and disseminating them across regions was one of the primary responsibilities of state governments. However, a national effort that could be shared across states, regions and even interest groups, could decrease duplication and increase usage.

Existing Feedback and Communication Efforts

There have been a number of efforts to provide research and development information to teachers and other practitioners. These include Phi Delta Kappan's Practical Applications of Research and research columns in such diverse practitioner oriented journals as the Kappan, Electronic Learning and Today's Education. Education Week also regularly provides information about national research studies and educational innovations. Federally funded efforts such as ERIC (Educational Resources Information Center), the NDN (National Diffusion Network) and the NIDRR Regional Information Exchange Program (National Institute on Disability and Rehabilitation Research) use a variety of ways including toll free numbers, computer bulletin boards, video tapes, displays at conferences, training sessions, brochures and even free overheads to provide information to teachers. Pilot attempts to replicate the U.S. Department of Agriculture's Extension model in education found the model effective in the three states tested but there are concerns that it may be too expensive to be implemented on a national level (Sashkin & Egermeier, 1993). In the model, county extension agents make "informational house calls," are available for technical assistance, and provide written and other sources of information.

Fewer ongoing efforts have been expended to collect feedback from teachers beyond an innovation's developmental period. One, the Northwest Regional Educational Laboratory collected teacher feedback on instructional software but this was not continued. Perhaps the best known teacher feedback system is EPIE (Educational Products Information Exchange). As part of EPIE, participating teachers use products with students and then review them for EPIE. The information is compiled and shared with subscribers, who tend to be those making software purchasing decisions, and with some developers. This program is not currently being implemented because, once teachers were no longer allowed to keep the software they were evaluating, many districts required teachers be paid for their evaluations.

Formal and less formal feedback and sharing systems have been organized around specific in and out of school programs or interests. Depending heavily on newsletters and meetings, networks such as the ASTC (Association of Science and Technology Centers) Teacher Network, Math Science Network/Expanding Your Horizons, the Tack Program and the IGE Network share information across members. In one teachers' research network, teachers not only share information but provide support and at times work on research cooperatively (Chattin-McNichols and Loeffler, 1989). Other

examples include special interest groups (SIGs) of organizations such as the American Educational Research Association and organizations such as the National Coalition for Sex Equity in Education. A primary interest in these groups is to share information across members, however getting that information from members to share with others is often a major task. One has to read very few newsletters before coming across pleas for information to share.

Teacher feedback is most apt to be collected as part of the formative evaluation and field testing of materials, programs and innovations. These efforts can range from half page questionnaires to extensive interviews and observations. Depending on the timing of the collection of teacher information, changes may or may not be made in the materials. Many completed products include teacher feedback sheets and request users to complete the sheets and return them, however in this evaluators' experience few or more often, none of these sheets are returned. Any teacher feedback that is collected is for the use of the developers; rarely is it shared with others, even the teachers who contributed their information.

There are, of course, informal networks for sharing information including the teacher room conversations and both formal and informal sessions and discussions at meetings of local and state professional organizations such as the NEA/AFT (National Education Association/American Federation of Teachers) and subject area organizations such as the NCTM (National Council of Teachers of Mathematics), the NSTA (National Science Teachers Association) and the IRA (International Reading Association).

Electronic Networks

With the advent of computer networks, there has been a rise in attempts at electronic educational communication both in terms of collecting feedback and encouraging interaction and collaboration. Many of these are project specific such as NJ BISEC's TIP (New Jersey Business, Industry, Science, Education Coalition's Teacher Improvement Program) network or the Harvard University's Teachers' Forum, while others are geographically based such as Texas' TNet and Alaska's Quill. Broader efforts have included Common Ground, IRIS and LabNet (Roupp, et al, 1993). Within more general computer networks such as COMPUSERVE and America On Line there are education special interest groups and bulletin boards on specific topics (i.e. math and science, disabilities), on educational research and on general education. Recently Editorial Projects in Education announced through the GTE Network the availability for educators of an e-mail service, a database and on-line copies of Education Week and Teacher Magazine.

The success of these efforts has been mixed. For example, based on low usage, the NJ BISEC TIP project shut down it's electronic network. Other efforts such as Girls Incorporated's proposed network are not yet viable. Playing To Win, an organization

of community computer centers estimates that about 10% of their participants are using their electronic network (Jeffers, 1993). Exploration of COMPUSERVE's teacher to teacher library found between July and December one to two new entries a month, half of which came from "The Society of Dead Teachers." This author received no response to her general query to the COMPUSERVE Education Bulletin Board asking teacher/participants why they used the bulletin board and why they felt other teachers did not. Yet the Technical Education Resources Center's LabNet has over 500 participating teachers and evaluation studies found participating teachers using activities suggested by other teachers (Ruopp et al, 1993).

Keys to success in building electronic networks for teachers are:

- a shared interest
- easy access to:
  a reliable computer network
  hardware and a phone line
  a trouble shooter
- training in how to use the telecommunications system
- a sense of responsibility to the project/network
- strong leadership (Levin, Kim and Riel, reported in Means et al, 1993, Ruopp, 1993).

There are access issues related to who uses computer networks and the degree to which users are disproportionately male, white and technically oriented. Much has been written about computer inequities in terms of class, race and sex (i.e. Sanders, 1986; Campbell, 1985). This may be an issue in electronic networks as well. One article summarizing the highlights of an electronic bulletin board discussion of educational policy quoted 20 respondents, 17 of whom were male (Glass, 1993).

There is a great deal of evidence of increased interest in educator use of electronic networks and increased teacher access to these networks. Examples include:

President Clinton's 1994 State of the Union pledge to "connect every classroom into the information superhighway by the year 2000."

Efforts of individual states including Florida, Texas, Pennsylvania, Virginia and Pennsylvania to establish networks that allow teachers to communicate electronically (West, 1994a).

Two companies, Bell Atlantic and Telecommunications, plan to link all the schools in

their service area (26,000- 25% of all schools in the country) to data networks (West, 1994b).

While K-12 educators remain a small segment of the user group, there are many efforts under way at the federal, state and local levels to increase their access to and familiarity with electronic networks (Education Week, 1994). These include:

Increasing teacher access to electronic networks is now a priority under the Fund for Innovation in Education, US Department of Education (Education Week, 1993).

Allowing Eisenhower mathematics and science program grantees (U.S. Department of Education) to use up to 20% of their funds to obtain equipment and telecommunication services (*Education Week*, 1993).

The development, broadcast and dissemination of a video tape from NASA for teachers on how to use INTERNET (Education Week, 1994).

The development of a grants program from The US West Foundation and the Annenberg/Corporation for Public Broadcasting Math and Science Project to "train elementary and secondary teachers in how to use INTERNET and other major computer networks" (Education Week, 1993).

The funding of five projects to bring rural teachers into the INTERNET networks (Education Week, 1993).

The tremendous growth of computer networks such as COMPUSERVE and Prodigy which are each reporting over 50,000 new subscribers a month. Even the 1993-1994 football playoffs were tied into Prodigy where viewers were invited to log on during half time.

At the same time there has been an increase in student oriented electronic networks. For example, TERC (Technical Education Resources Center) and National Geographic's KidsNet have been successful in providing students with an electronic network in which students systematically collect and report scientific data which is aggregated across student groups and summaries provided to participating students and scientists. Such a pool of data helps students look at their site data in context while also providing scientists with much more geographically representative data. At this point approximately 10,000 schools, primarily in the United States, are using it (Barstow, 1993). This type of student feedback and central compiling and synthesis of student collected information will be increased dramatically and internationally with the GLOBE program under the auspices of Vice-President Gore.

Public or private, in school or out of school, electronic networks are with us. While students may be ahead of teachers (in one district the students actually wired the

network and taught the teachers how to use it (Fortune, 1993)) and administrators may currently have more access than teachers (West, 1994b), the country appears to be committed to putting schools and teachers on the information superhighway.

This commitment has great implications for the ways that information is collected and disseminated. Not only does it mean that teachers, and others, will have the potential to access huge amounts of information, it can mean that these same teachers can more easily provide information to others. This information can be summarized and shared in different formats with researchers and developers, policy makers and practitioners. This may be done automatically, under the direction of a computer program designed to summarize the data, or under the direction of educators/researchers. While the automatic summaries would be faster and less expensive, the "human summaries" could include interpretations and analysis.

The growth of electronic networks has the potential to make a model of two way communication and information sharing possible. The technical challenges of setting up such a system are not great. But, as the following section describes, the societal and psychological challenges are.

III. CHALLENGES TO FACE

Changing the Focus: Teacher, Student and Policy Maker as Customer

In education as in government we have tended not to see teachers and students or even policy makers as customers. Yet they are. If teachers don't "buy" or use our results or innovations or if teachers try a product or innovation and are dissatisfied and have no recourse, then we have not been successful. As with business we want customers to try our product and to have it work well so they will continue to use it and even tell others. Yet there are always "kinks" -- things that are unclear, problems or things that are just wrong. When this happens in other areas of life we often end up contacting the manufacturer's Customer Service Department.

Industry, particularly the computer industry, gets much of it's feedback on problems and needs from people who are confused or in trouble and call customer service. While I am not going to call to tell Word Perfect what I think of their product, I will call if I can't figure out how to get the copyright sign or if my screen locks when I push a combination of keys. And while I am getting my questions answered I'm willing to talk more generally about Word Perfect as well. I get something I need, Word Perfect gets something it needs and during the exchange, my information is entered into a database for later summary and analysis.

There are two ways that I, the customer, get to access customer service. For some products all I have to do is buy it and I get the customer service numbers. Others

request I fill out the warrantee card first. By doing this I get access to free customer service for a specified period of time and the company gets additional information from me. In education we don't have customer service departments, but we need to. And as teachers and others call, for example, the National Council of Teachers of Mathematics with questions about the implementation of the standards or call the Technical Resources Information Center with questions about the implementation of KidsNet, they can be asked questions about their response to the innovation and areas in which improvement could be made. This information could be summarized and used by the developers for revision purposes and by other consumers or potential consumers.

In From Red Tape to Results, Vice President Gore said that the government will "require that all federal agencies put customers first by regularly asking them how they view government services, what problems they encounter and how they would like services improved" (1993, p. 44). This is an unprecedented step in the collection of user feedback -- yet, if the user doesn't get something out of it -- a reward, immediate information that the user needs, or specific indications that the information the user provides is being listened to and acted upon, then the quality and quantity of data needed for such a system to work will not be collected.

Answering the Question: What's In It For Me?

> *All of us -- bureaucrat or business owner, cabinet secretary or office clerk -- respond to incentives. We do more of what brings us rewards and recognitions, less of what brings us criticisms* (Gore, 1993, p. 43).

Vice President Gore's quote may seem obvious but it is not. In education we tend to believe that teachers don't need incentives, that teachers will "do it for the sake of the children" independent of incentives or disincentives. Yet teachers, too, do what brings rewards and recognition. Thus, for this system to work it must address "what's in it for me?"

There are a variety of incentives that can be used to encourage participation including:

- "paying" for access to information by providing information
- receiving free trial materials and technical assistance for pilot or "beta" testing
- receiving "coupons" for lower cost or free related educational materials
- receiving recognition as a valued professional innovation reviewer
- receiving feedback about how the information is being used by others and its impact

- knowing that your experiences and evaluations as an innovation reviewer are being taken seriously and used by others

- being paid.

These incentives have all been used with varying degrees of success. They need to be systematically tested and compared for relative effectiveness.

For too many years teachers have viewed research and evaluation as a "black hole" where their efforts and those of their students' (and many, many reams of paper) have gone somewhere for some purpose but they don't know what. It is very difficult to keep doing something and doing it well, if you receive no feedback about the results of your action.

This was an issue facing Amnesty International whose members regularly write letters to foreign governments asking for the release of prisoners and investigations into deaths or ill treatment. Letter writers rarely receive any response from the governments and when they do, it tends not to be positive. Amnesty keeps letter writers motivated by periodically providing information about the release of prisoners, thanks to the letter writing campaigns. In a very concrete way this tells people that what they are doing is important and has an impact.

Providing teachers/users with specific information on how the feedback is being used, including occasional stories from developers and implementers on how things changed because of the feedback, can both motivate participants to continue and perhaps encourage others to join in.

Being listened to and being taken seriously can be an incentive as well. Unfortunately being seriously listened to by educators is not that common an experience for teachers. Indeed no teachers were invited to participate in the initial National Education Summit. Not surprisingly teachers participating in research studies reported they liked to talk to researchers who actively listened to their concerns and that they were moved when their expertise and concerns were sought out by the researchers (Beyerbach, 1989). To have evidence that they are being listed to can be a powerful motivator.

Being listened to by fellow teachers is one thing, being listened to by policy makers and researchers and developers is another. For any system to be more than a formal teacher exchange, there must be "buy in" from policy makers and researchers and developers to access and where appropriate use the information, and to feed back to the system how they use or are planning to use that which they accessed.

It is easier to get teachers to do things, if there is a direct relevance to their job; they also do things that are required. It is possible to require teachers to try a feedback

system but unless it is useful to them -- that is direct, concrete and classroom specific -- teachers will not continue.

Possible Ways of Selecting Innovations to Include:

There are a number of ways that innovations could be identified to be included in a feedback system. These could include:

- nomination by developer
- nomination by a team of practitioners and researcher/developers
- nomination by at least 10 practitioners
- nomination by self and others combined with further exploration by designated experts
- innovations seen by the Education Department or other sponsor as widely used
- self-nominations or applications to review panels such the Department of Education's Program Effectiveness Panel which identifies effective programs for dissemination by the National Diffusion Network and types of review groups.
- selection of innovations that are already receiving federal support for development or demonstration purposes.
- special national search procedures to find the best products or programs intended to fulfill specific purposes such as to teach reading.

More thought needs to be given to the fairness, utility and cost implications of including innovations in these feedback systems. For example, if developers and commercial publishers are encouraged to put their own products in such a system, will they also be asked to bear some of the costs? If so, would exceptions be made to encourage teacher developers and others with less access to evaluation/marketing funds?

Since it is doubtful whether initially users would input their own or other adaptations, the focus on more widely used or promising innovations would seem more logical. It is possible that feedback systems could be tied into a database of innovations where there is electronic access to available innovations, curriculum materials and products. While this combination and expansion of a variety of existing, less formal efforts would be a somewhat different project, it would facilitate the spread of information on innovations as well as the collection of feedback on their use.

Possible Types of Information to Collect:

Any system established should, most likely, focus on the collection of evaluative information; primarily teacher and administrator perceptions of what worked, what didn't and what could be made better. There could be opportunities for users to input impact data. This would be at best a supplement to research results, however the complexities of summarizing and assessing the quality of this data suggest that this not be part of any initial efforts.

There are a variety of types of information that could be collected from users. These could include structured and open-ended responses such as:

- Innovation name
  - Unit of innovation (i.e. classroom, department, school, district)
  - Subject area(if appropriate)
  - Grade level (if appropriate)
  - Track (if appropriate)

- Demographics for the unit of the innovation (i.e. class, school, district)
  - Size
  - Geographic location
  - Rural, suburban, urban
  - Ethnic and gender breakdown of population
  - SES of population (free lunch or some other measure)

- Ratings of innovation
  - Overall Rating
  - Ratings of:
    - Student Instructional Materials
    - Teacher Instructional Materials
    - Content:
    - Accuracy
    - Degree fits in existing curriculum
    - Student affective response
    - Student cognitive response
    - Ease of access to necessary materials
    - Amount of prep time
  - Ratings compared to appropriate competitors

- Training:
  - training needed
  - quality of training provided
  - comprehensiveness of training provided

- Amount of administrative support needed

- Open-ended or Checklist Responses
  What are the strengths of the innovation?
  What are the major problems encountered implementing the innovation?
  Which were solved?
  What were the major effects on students? Were there differential effects for different groups of students such as girls and boys, higher and lower achieving students?

- Open-ended
  What advice would you give to others trying this innovation?
  How were major problems solved?

Systems could also be designed such that innovation users could indicate if they would be interested in being contacted by other educators interested in adopting/adapting the innovation. As part of the set up of any system, a number of teachers, possibly through NDN, should provide information on their response to different innovations. Before any system "goes public" it should have a base of information and feedback so initial inquirers would receive useful information.

Possible Types of Information to Be Fed Back

Regardless of the system established, no information on an innovation should be provided until a selected number of teachers and learners have provided input. Conclusions should not be drawn on the responses of one or two people. To collect an initial pool of information, teachers who are using specific innovations might be recruited by developers, professional organizations or existing computer networks to provide feedback for a small fee.

It would need to be decided as to whether all information provided by teachers, and others, would be included in the summaries or if there would be a professional team who would sift the data, weed out data that was not appropriate and, if necessary, recruit additional teachers to review the innovations.

To some degree the type of information provided would need to be targeted by the inquirer. For example a state education department official might be interested in the aggregated response to GESA (Gender/Ethnic Expectations Student Achievement) while a principal might only be interested in implementation data from urban elementary schools. If there were not enough data from urban elementary schools to be given alone, then the principal would receive the overall summary.

Also some inquirers might only want summaries of teacher ratings, while others,

particularly teachers and developers, may be more interested in the open-ended responses and the opportunity to speak with someone who has implemented the innovation. It is important to build this kind of flexibility into whatever systems are developed.

A Possible Model for An Innovation Feedback System

The following is a description of one possible model to obtain feedback on promising and exemplary education innovations. In this model inquirers could request a list of innovations covered by the system by such variables as unit of innovation (i.e. classroom, department, school, district), subject area and grade level or enter the innovation. The information they would receive could include:

- a 2-3 paragraph summary of the innovation including impact evaluation results and information on where to call/write for information on implementing the innovation including sources or training and materials. (This would have been put in the system by staff or developers.)

- the number of teachers/other users who have provided information on the innovation and the types of students/schools over which the innovation has been used.

- the number of people who have accessed the feedback and their reported use of the information received.

- "objective" information summaries. This information may be reported in total, disaggregated by such variables as geographic location, population SES, or for a particular location, or SES group if the cell sizes are large enough to make this appropriate. The information summaries would include:

- a summary of user ratings in each category -- including means and frequency counts

- a summary of user check offs

- graphic representation of the data.

- open-ended summaries:

Inquirers can choose to receive responses to any or all of the open ended responses. Ideally they would receive a one to two page summary that focuses on the reoccurring issues and themes generated in the open-ended responses along with sample quotes. However it is not clear how feasible this would be; the person hours necessary to do

this analysis and keep it updated would be very high. Other possibilities include:

- the inquirer being able to do a key word search and receive unedited open-ended responses

- the inquirer receiving a random sample of open-ended responses.

If they desire, inquirers could also be given the names and telephone numbers of two or three innovation users who implemented the innovation with populations similar to those of the inquirer and who would be willing to discuss the innovation.

Other models might include subsets of the above model or include more access to "raw" teacher and administrator data or could focus on expert interpretations of the data. Certainly whatever information was provided would need to be updated periodically. If the summarizing system was programmed into the system, this would not be a major issue. If however experts were needed to review new data and possibly revise the information provided to inquirers, it would be necessary to schedule this either based on time (i.e. a new update every six months) or new data (i.e. a new update each time 25% more data is received).

Regardless of the types of information provided in feedback, the inquirer could be asked to input, perhaps using a checklist with an option for an open-ended answer, how they are planning to use the information. To increase the amount of data available to the feedback system, inquirers could also be asked if they have information on any innovations they have tried and if they would be willing to input their information. They could then be provided the opportunity to input their information.

Getting the Word Out: Selling The Concept of A Feedback System

Key to the success of any feedback system is letting people know it is available. Certainly to do this the traditional modes of dissemination should be tapped - ads and articles in professional publications (i.e. Education Week, Today's Teacher, Science Teacher, Young Child) and regional and state newsletters. Feedback systems should be demonstrated at national and state conventions of the AFT, NEA, NSTA, NCTM, IRA and NCTE (National Council of Teachers of English), where teachers have opportunities to enter and receive information. This could also serve as part of pilot efforts to test various input, output and incentive strategies.

Word about any feedback system could also be distributed through existing networks, both commercial networks such as COMPUSERVE, Prodigy and On Line America as well as professional networks including ERIC, INTERNET, BITNET and the National Science Foundation's STIS (Science and Technology Information System). This might

include a short tutorial on how to get into the systems from the specific network (if that is possible) as well as how to use them.

These efforts would reach most developers and researchers and many teachers. However to reach most teachers it will be necessary to tap into the general media; through magazine and newspaper articles and even public service announcements that give people information about feedback systems and ways to access them including, if appropriate, the 900 telephone number. And never underestimate the power of a famous spokesperson for a system.

The process of getting the word out and getting teachers and other users involved should depend heavily on Baker's (1987) tactics of innovation. Baker reminds us that by using words and concepts that people are already familiar with, publicity efforts should stress the advantages of any system used, it's simplicity to the user and it's reversibility (once in the system you can get out of it).

IV. TECHNICAL ISSUES: CAN A TEACHER-FRIENDLY, ELECTRONIC NETWORK BE DEVELOPED?

Issues of cost and system/user/inquirer interaction mean that ultimately any comprehensive system must involve an electronic network. However it is clear that beginning only with an electronic network will leave many teachers "out of the loop." Initially any system should include multiple modes of input and output to "hook teachers in." Modes of input could include:

- An 800 Telephone Number:
  Alternative I: Users with push button phones would speak in the name of the innovation and their name, school, address and so on. They would enter innovation rating and check off data on an innovation. The current status of voice recognition software would mean that the taped information would have to be listened to and entered into the database by hand. Users would then be given numeric and alphanumeric code based on their name/zip code they would use when providing additional information or when accessing information.

  Alternative II: Users would speak directly to an operator who would enter the information into the data base during the conversation.

- Mail/Fax:
  Information forms would be widely distributed to teachers and others through professional organizations, unions, newsletters and other sources. These forms would be mailed or faxed to a central location. There are a variety of problems with this mode including all information must either be scanned in and checked or entered by hand. In addition there is no potential for interaction between the

users and the system. Too, it is most difficult to motivate users to use this system.

- Electronic Network:
  This is of course the best option, but as indicated earlier, at least initially it should not be the only option for any system that wants to reach a representative group of educators. The network could be accessible through existing computer networks including INTERNET, AMERICA ON LINE, COMPUSERVE and BITNET. To encourage use of the electronic network, users of other options could be provided with information on how to access the network. Users who used the network to input information could be given extra incentives including perhaps greater or cheaper access to information, greater reduction of rates on materials and so on.

Output Options Could Include:

- A 900 Telephone Number
  Inquirers would give an operator or a tape their name, school, address and so on and the innovation about which they would like information. The information would then be mailed or faxed to them. Their telephone number would be billed for the cost. If the inquirers were also users, they would give their code and either would not be charged or would be charged at a lower rate.

- Fax/Mail
  Inquirers would fax or mail requests for information to a central location where their requests would be filled. If there is a fee, inquirers would have to include a check or credit card authorization with their request. If the inquirers were also users, they would give their code and either would not be charged or would be charged at a lower rate.

- Fax/Telephone
  Based on a system already in use by computer companies, inquirers would telephone in, on their fax line, using a push button phone to punch in their fax number and the innovation(s) about which they want information. Pushing the receive button on their machine, the innovation summaries would then be automatically faxed back to them.

- Electronic Network
  As was the case with the input options, this is the best option, but again at least initially it should not be the only option for any system that wants to reach a representative group of educators. The network would allow for immediate response and interaction as well as being significantly cheaper. To encourage use of the electronic network, inquirers who used other options could be provided with information on how to access the network. Inquirers who have

provided information to a system could be given cheaper rates.

At some point, regardless of the system developed, for both cost and quality reasons, designers should consider phasing out telephone, telephone/fax and fax/mail input/output options and having all interactions conducted through the electronic network. To use a network it would be necessary to have:

telephone access
a computer with a modem and communication software
either direct access to the network or indirect access through another computer network.

Most people need a person with technical experience to set up communications software for them. The logical place for that to happen is in the school or the district. Almost all schools now have computers and most of them have modems. However, during the school day is when teachers have the least amount of time and least access to telephone lines. For teachers to use the network through the school -- it would have to be before school, after school or during prep periods.

Teachers might use their home systems. However while many teachers have home computers, fewer have modems and even if communication software were given to teachers, many would be unwilling or unable to set up the software. Once the software is setup for a computer, it is very easy to get on a network. For example with Magicsoft, once it is installed with the log-on numbers and passwords put in the software, to enter COMPUSERVE takes one click of the mouse and two presses of enter. Everything else including dialing is automatic. However it takes some skill to set up the program to do this. One possibility is for the Department of Education to work with a software company or a company that manufactures modems, such as Hayes, to develop easy to install communications software for relatively simple computer systems that do not have, for example, on-line fax software. The Department could subsidize the development of the software and recommend it's use or purchase. For some schools such as Chapter I schools, the Department could distribute a certain number of copies of software.

While this paper is focusing on systems to collect and disseminate teacher information on innovations, such a system could and should tie into other systems under consideration. Hooking a teacher feedback system into a database of existing innovations would help in the dissemination of information about innovations. Working with software and hardware companies to develop teacher friendly telecommunications software is an important step to hooking teachers and schools into the information superhighway. Too, any feedback system that is developed could be a part of a larger system that included research and impact evaluation data on innovations. As a variety

of systems are contemplated, it is important to assume that in some ways these systems will be integrated and to set up their designs so that this is possible.

What is being proposed is not a "stand alone system" dedicated only to collecting feedback on innovations; rather this should be seen as one aspect of a broader based effort to connect schools, policy makers, researchers and developers as education is restructured.

V. RECOMMENDATIONS

There are a variety of low and no cost steps that can be implemented now while discussions are begun about the feasibility of a national system. While there is much to be gained from a national system, one does not have to be implemented to increase the collection and use of teacher feedback.

An important early step is to include the need for teacher feedback as a dissemination standard for the National Science and Technology Council and its Committee on Education and Training which coordinates federal efforts in these important areas. This will begin to increase awareness of the need for and the value of teacher feedback. At the same time a panel of teachers, developers, dissemination specialists and computer network experts should be convened to work on the development and implementation of an entire feedback system.

Simultaneously a number of pilot teacher feedback efforts can be relatively easily established. These can include:

A. Making teacher-based feedback loops part of existing programs.

National Dissemination System: The collection of teacher feedback can be incorporated as part of National Diffusion Network and related federally funded dissemination efforts. As part of their NDN funded promising or exemplary program, its directors could collect a common core of information about teacher and student responses to share with other potential users. They may also collect additional information for their own use in revising or adapting the program. The raw data, preferably in machine readable form, is provided to the Department or to program developers or others for summary, analysis and broader dissemination- perhaps through the ERIC system.

NIDRR Regional Information Exchange Program: As part of their evaluation effort which documents activities and adoptions and the involvement of family members, consumers and members of cultural minority groups, participant feedback can be

collected, summarized and provided to interested consumers as part of the Exchange Program's dissemination efforts.

Labs and Centers: Labs and Centers can be required to collect feedback from teachers and others on their own materials and those of other programs and innovations and to provide summaries of the feedback in their newsletters and other dissemination efforts. In addition Labs and Centers can serve as "feedback centers" collecting and disseminating teacher feedback about other organizations' products and programs as well. In cooperation with the National Diffusion Network, the Laboratory Network Program has already done some of this in connection with their recent publications: *Promising Practices in Mathematics and Science Education* (1994) and *Mathematics, Science and Technology Programs that Work* (1994).

ERIC: ERIC can be used to disseminate feedback on innovations collected by other sources. Currently, ERIC commissions and disseminates papers on a variety of topics. They have commissioned and disseminated papers and consumer reports such as *Secondary Special Education: A Guide to Promising Public School Programs* (Warger & Weiner, 1987) and could do more to collect and synthesize teacher responses to different innovations.

B. Set up a mini feedback system.

There are existing electronic education networks, including COMPUSERVE's Education Forum (SIG). In much the same way that the American Educational Research Association set up an educational research bulletin board through COMPUSERVE, the Department could set up a mini feedback system through one of the existing electronic networks (i.e COMPUSERVE, INTERNET, AMERICA ON LINE) where teachers would rate specific innovations on 2-3 variables and give some open-ended responses that could be accessed through key word searches.

C. Develop and disseminate summaries of teacher feedback currently being done through Department projects.

Formative evaluation results from existing projects can be collected and one-two page summaries can be written aimed at the interests and information needs of specific populations. These can be disseminated through ERIC and/or through existing network bulletin boards.

D. Develop a teacher feedback panel.

Drawing on expertise and good will of teachers already involved with the Department as consultants, grantees and award winners, specific teachers can be asked to provide and feedback information to the Department on innovations they

have tried. These same teachers can be paid a small honorarium to collect similar information from other teachers. Again one to two page summaries can be written, aimed at the interests and information needs of specific populations which can be disseminated through ERIC and/or through existing network bulletin boards.

E. Modify the review criteria for proposals in grants announcements to include the collection of feedback from teachers.

Currently most Education Department programs require program evaluation. As part of that evaluation, the collection of teacher responses to the program/innovation could be required including even a common core of questions that could be answered to help educators compare programs/innovations. This information would be included in project reports with a summary provided with program/innovation dissemination efforts.

In conclusion, big system or small, electronic or not, state wide or national, all innovations or a selected subset, we need more information on what happens when innovations are implemented. We need it to make better policy decisions, we need it to develop better innovations and we need it to make better decisions on what innovations to use. There are things we can do now to better collect and share teacher information. We need to begin.

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APPENDIX: SOME KEY CONTACTS

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