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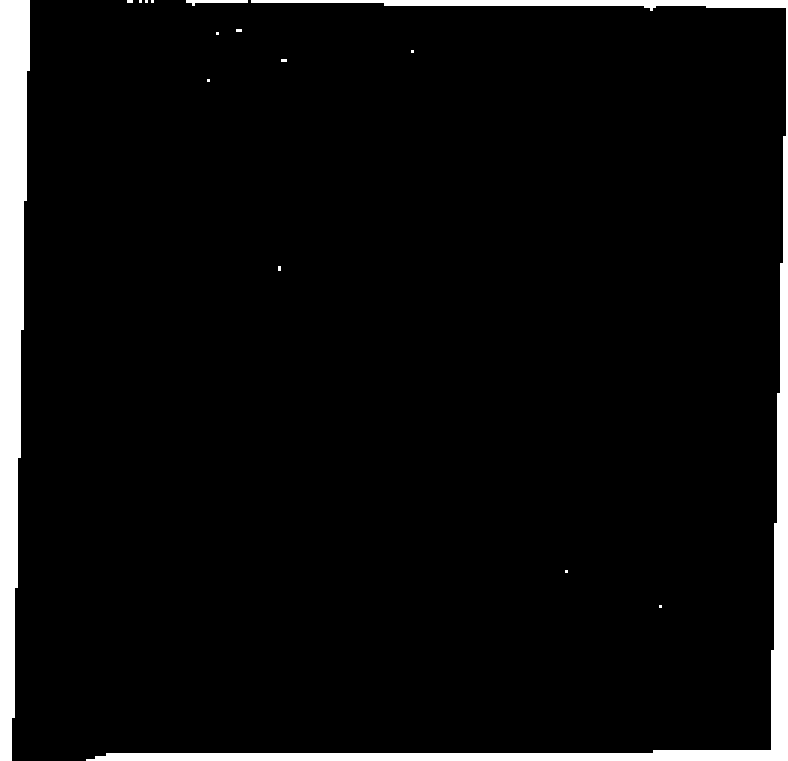
ABSTRACT

Development has traditionally been seen as part of a one-way street running from the researcher to the practitioner. Studies of the "mutual adaptation" of development products undercut this view of development and suggest that it should be seen as a two-way street that takes into account the practical knowledge of teachers and administrators. A participant observer study of two efforts at "collaborative" development in the fields of basic skills and career preparation illustrate the kinds of practical knowledge that practitioners bring to the process and the changes in development processes that result. The study concludes that the practical knowledge of practitioners, linking agents, and developers all contribute to the development process. In addition, development products need to provide enough flexibility to encourage intelligent local adaptation, but enough guidance to really provide educators with new knowledge. (Author/PN)



Abstract

Development has traditionally been seen as part of a one-way street running from the researcher to the practitioner. Studies of the "mutual adaptation" of development products undercut this view of development and suggest that it should be seen as a two-way street that takes into account the practical knowledge of teachers and administrators. A participant observer study of two efforts at "collaborative" development illustrate the kinds of practical knowledge that practitioners bring to the process and the changes in development processes that result. The study concludes that the practical knowledge of practitioners, linking agents, and developers all contribute to the development process. In addition, development products need to provide enough flexibility to encourage intelligent local adaptation, but enough guidance to really provide educators with new knowledge.

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KNOWLEDGE USE IN EDUCATIONAL DEVELOPMENT:

TALES FROM A TWO-WAY STREET

Educational development has been seen as a one-way street running from the researcher to the practitioner. The National Science Foundation defines development as "the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods..." (quoted in Schutz, 1970, p. 41), and development has been seen as the mid-point in a three-step process leading from research to dissemination (Havelock, 1973).

Ironically, research--specifically studies of the implementation of innovations--has contributed to the declining interest in development in recent years. These studies raise questions about one-way strategies by indicating that practitioners are active assessors and modifiers of development "products." Through processes of cooperation, mutual adaptation, and local reinvention, educators customize development outputs in light of local circumstances, values, and beliefs (Greenwood, Mann, and McLaughlin, 1975; Rice and Rogers, 1980). The extent of these changes raises serious questions about the utility of research based development. Meanwhile a number of alternatives have been created including the use of "linking agents" (Hood and Cates, 1978; Louis, 1977) and the sort of school-based development funded by Title IV-c.

Perhaps because the models for educational development in the late '60s were areas like defense and NASA where development was so research

based (Bailey, 1970), developers often ignored the potential contribution that educators' practical knowledge could make. Practical knowledge is analagous to the medical doctor's clinical experience which "gives the doctor the knowledge he needs to treat patients successfully, even though that knowledge has not yet been systematized and scientifically verified. One does not acquire this knowledge through academic study but by seeing clinical phenomena and dealing with problems first hand" (Becker, Geer, Hughes, and Strauss, 1961, p. 231). Even research knowledge is based on experience analagous to practical knowledge. According to Campbell (1977, p. 2), "Even for the strongest sciences, the theories believed to be true are radically underjustified....In any setting in which we seek to gain new knowledge, we do so at the expense of many presumptions.... While the appropriateness of some presumptions can be proved singly or in small sets, this can only be done by assuming the correctness of the great bulk of other presumptions." The generality and narrowness of scientific findings create problems for practitioners who work in specific, multi-faceted settings. Practical knowledge is used to fill the void.

How can developers incorporate practical knowledge into their products, and, for that matter, what sources of practical knowledge are most important? One useful time for building in such knowledge comes during the pilot testing and field testing stages of development when practitioners have the opportunity to use and react to new products. Recently, Research for Better Schools (RBS) began a long-term development effort that was characterized by, among other things, an attempt at "collaborative" development which would at a minimum take practitioners input very seriously

in revising and reformulating its work by bringing practitioners into the development process. Case studies of development groups at RBS working in two different substantive areas illustrate the dynamics of a development process relying heavily on practitioner input, the kinds of practical knowledge on which practitioners rely when responding to new products, and the kinds of revisions that result. To illustrate the dynamics of this development and revision process, this paper will describe the initial intentions for what would be developed, practitioner responses, and how the revisions were made. Comparison of two cases suggests both regularities in the development process and possible sources of variation.

The Case Studies

Since it was founded in 1966, RBS has been active in the development and dissemination of such educational products as Individually Prescribed Instruction and Experience-Based Career Education. In 1977 it began long-term efforts to develop "approaches" that the staff of state departments of education and regional educational service agencies and curriculum experts in large school districts could use to help schools improve programs in a specific curriculum area. The central core of each approach was to be a flexible set of steps or procedures for identifying improvement needs in a particular curriculum area and then selecting the specific change(s) required for meeting those needs. Typically, the approach would entail some sort of data-based assessment of local wants and conditions, a decision process through which school personnel selected changes to be implemented, and some implementation activity. Each approach would be

partially embodied in a set of written materials--manuals, work sheets, reference graphs, and so forth--but use of the approaches in specific contexts was expected to require special adjustments in each case. Hence, RBS expected to develop the materials for school use and then train outside experts who would help school people use the materials and follow the procedures in specific instances.

Two of these approaches were in the fields of basic skills and career preparation. Each was developed by a work group consisting of (1) field staff who presented approaches to school personnel and initially modeled the role of the external helper using those approaches and (2) developers who designed the approaches, prepared materials embodying the appraoches for use in the field, and were responsible for a substantial portion of the materials revision process. During the 1978-79 school year, the two groups began working with a number of urban, suburban, and rural schools to refine these approaches. The Career Preparation Group worked with secondary schools while the Basic Skills Group worked with elementary schools.

In 1978, RBS initiated a separate research effort to use the activities in schools working with the development groups to learn how schools change and how external agencies can facilitate school improvement. The research group intentionally used naturalistic or ethnographic methods to study local change processes (Guba, 1978; Wolcott, 1975). These methods were intended to yield grounded theory, generated from intensive experience in schools, about educational change (Glaser and Strauss, 1968). For two years, participant observers followed the change processes initiated by

the development groups in five schools, three working with Basic Skills and two with Career Preparation. The researchers observed meetings between development group staff and the committees of local educators involved in the implementation of the approaches in specific schools; conducted extensive semi-structured interviews with committee members and other school personnel; interviewed development group linkers in a less structured manner, interacted socially and professionally with both linkers and developers; and compiled massive files of the proposals, papers, and materials produced by the two components (Donner, 1980). Most of the reports from this research have dealt with the nature of planned change in schools (e.g., Firestone and Corbett, 1981). However, the data collected also provide the basis for this report.

Original Intent for the Approaches

RBS brought over a decade of practical knowledge of the development process to this effort, but its thinking was shaped substantially by the Rand Change Agent Study (Berman and McLaughlin, 1975) and other implementation studies that stressed local adaptation of development products. This research was one factor moving the components towards "collaborative development"--an effort to get the schools involved in development and to revise materials on the basis of practitioners' input. One development group described collaboration as "a working relationship in which the expertise each collaborator brings to the task is recognized and respected by the other" (Basic Skills Group, 1979, p. 13), an indication of a new respect for educators' practical knowledge. Still, since

the schools participated in the development efforts to reap benefits for their own programs, they were not interested in creating approaches to be used elsewhere. Moreover, they had limited previous experience in educational development. Lack of school motivation and experience plus the older tradition of development combined to place the burden of developing the approaches squarely on the development groups.

The two development groups differed in the knowledge bases they relied on, the change process built into their approaches, and in the kinds of materials they intended to create. Basic Skills intended to draw heavily on existing research, and even to some extent designed its approach to include research-like activities. This development group relied on the growing body of classroom effects literature that correlates instructional and classroom management strategies with gains in student achievement. [This summary is necessarily brief. The reader interested in more detail is referred to the work of Graeber (1980), Helms (1980), and Huitt and Rim (1980).] The intent was to identify, from research, "variables" that teachers and administrators could manipulate to improve student achievement. For example, one of these variables was "student engaged time"--that is, the amout of time students spend in basic skills learning activity. Student engaged time is actually a variable used in a number of studies of effective classrooms. Basic Skills expected that most of its "variables" would literally be variables shown by previous studies to be correlated with student achievement in reading, math and language arts. The development group devoted most of its 1978-1980 effort to developing

a system for diagnosing student engaged time rates in classrooms and for helping teachers identify ways to increase those rates. (This discussion of Basic Skills is limited to its work on the time variable.)

The heart of the Basic Skills approach was a cyclical process for collecting data relevant to each variable and applying those data to a local planning and change process. First, practitioners were to use procedures modeled on those from the original research to observe and collect data on the variable in question. Second, they compared the data collected to reference graphs derived from earlier studies to determine if optimal levels had been reached. Third they reviewed findings to determine what changes were needed, and finally they implemented those changes. As appropriate, the practitioners would repeat the original data collection activity to see if any change had been accomplished.

Basic Skills developed a massive body of materials for the student engaged time variable. Most were for the first two phases. Initially, teachers were expected to observe the classrooms of their peers and count the number of students engaged and unengaged in learning activities at specific intervals. In later versions, behavior was classified as unengaged because of management, social, discipline, or other activities. To get a reliable data base for comparison, teachers were expected to go into each other's classroom to observe for several periods. Classrooms would be scanned at one or two minute intervals, and the number of children in each category would be recorded. Then numbers were plugged into a formula to get an engagement rate and compared against reference graphs created through a secondary analysis of data from previous studies.

eventually, Basic Skills compiled numerous manuals, videotapes for training purposes, tests to ensure that teachers mastered the observation system, reference graphs, and compilations of techniques for increasing time.

The Career Preparation knowledge base consisted primarily of descriptive accounts of earlier career education programs at RBS and elsewhere and programmatic statements about career education goals and how to plan. These came from existing career education programs, federal and state career education objective statements, and the practical knowledge of the Career Preparation staff (Career Preparation, 1979). Career Preparation's guiding assumption was that educators should make "data-based decisions" when planning a career education project, but the group emphasized local control of the planning process. One linker in the group told a district that "individual linkers will work with schools and explain the general approach, and schools will decide what they want. This is a way which might be profitable. If you want to go this way, we'll help; if you don't, we'll still help you." Beyond this basic assumption, Career Preparation did believe that successful programs would be experience-based, should have substantial student and community involvement, and should be planned systematically.

The central activities of the Career Preparation approach were a planning process intended to identify gaps between local career preparation goals and actual school performance. First, a committee of school staff, students, and community residents identified goals for a project. Next,

these goals were used to generate surveys to identify community, student, and staff perceptions of career education needs. These surveys were used to refine the initial goals. Then school and community resources were identified. Afterwards a program was planned, implemented, and evaluated. The group suggested that a successful program might "infuse" career education into existing curricula, or use mini-courses, special events, work experience, and the existing guidance program to meet its goals.

In keeping with the emphasis on local decision-making, the materials developed by Career Preparation were like a library. There were many resources for participants to choose from, but there was no single package or programmatic set of materials for developing a project.

Practitioner Response

Teachers and administrators were active recipients of the RBS approaches who brought substantial practical knowledge to the task. Some of this knowledge had to do with how to teach, but it also pertained to coping with the school as a workplace. That is, teachers knew what their responsibilities were and how much time they took, how long a "reasonable work day" was, and what norms had to be followed to get along with their colleagues. Teachers evaluated the RBS approaches in light of all of this knowledge.

Basic Skills. Teachers working with Basic Skills' approach used their knowledge of instruction to assess that approach in general as well as its specific aspects. They were not concerned a great deal with the technical reliability and validity of the observation and comparison

process the development group developed. Rather they judged the approach in terms of its congruence with their beliefs and values about what "works." The whole concept of increasing students' time engaged in learning had considerable face validity and generated enthusiasm among numerous teachers. In fact, teachers in two sites implemented strategies to increase the amount of time students spent on their work even before training on data collection and comparison had been completed. Where the "data" conflicted with practical knowledge, however, teachers often followed their experience. For instance, the Basic Skills' reference graphs suggest that more engaged time is usually better. But one teacher did not want to increase the time spent in a subject area arguing that "forty-five minutes is plenty enough for a first grader...I'm not going beyond that." Several others claimed that children need breaks and changes in what they do to get the most out of a lesson. Observational data in one school indicated that the biggest loss of time was in the transition from one assignment to another. Yet, the teachers argued that "in this school the number one problem is discipline" and proceeded to implement changes to reduce disorder.

Teachers also knew that they had a number of tasks to complete besides participation in the project and felt responsible primarily for instruction of their classes. Many complained about the time involved claiming that "our main problem is that we didn't know how much time it would entail," and "It seems to have its good points, but it's taking up so much time that I can't get to my regular work."

Practical knowledge about instruction was changed by training in the Basic Skills approach, but these changes were more conceptual and informal than procedural. They reflected as much a form of what Weiss (1980) calls enlightenment knowledge as skills development or the rote, high-fidelity implementation of procedures. Educators trained in the approach rarely used the diagnostic process for assessing engagement rates as it was designed by the development group. Instead, bits and pieces of the process were incorporated into their working "bags of tricks" for teaching and administration. For instance, several teachers and principals informally adopted the activity of scanning a classroom to identify how many children were engaged in learning activities. This was a simplified version of the formal observation procedure developed as part of the Basic Skills approach. Two principals incorporated it into their strategy for classroom observation, and teachers reported that they scanned the class as a whole more systematically after training than they did before. Teachers also incorporated new concepts and ideas into their way of thinking about their work. One teacher reported, "RBS did point that out to me that you do lose a lot of time passing out and collecting, in the management part of your day...and your instruction time can be added on to by having more things readily available." Thus, lessons from Basic Skills' approach were incorporated into their practical knowledge.

Career Preparation. Paradoxically, Career Preparation suffered from the absence of practical knowledge in one respect. Teachers were unfamiliar

with the idea of career education. One linker explained that "the first thing we learned when we came to defining career education and developing career education goals, it went on and on and on....Many people on the local planning team had never heard of career education before." Because of their lack of knowledge, school staff could not always make the independent contribution to local decision-making that Career Preparation expected.

Still, practical knowledge was used to supplement "data based" decision-making. For instance, after needs assessment results were examined at one school, teachers felt that some goals relevant to career education had been left out. Although data on those goals were missing, they were still incorporated into the project. Practical knowledge also guided project design. Because several administrators had adverse experiences placing students in work settings before, community involvement was minimized.

As in Basic Skills, members of Career Preparation teams reported that awareness of career education became part of their practical knowledge. Several found themselves looking for potential career education activities as examples while working in other curriculum areas.

Revising the Approaches

Field staff and developers reacted to practitioner use of the approaches in somewhat different ways. The field staff had to make immediate adjustments to keep local projects operating while providing feedback for future project development. They spent a great deal of time developing and

maintaining trust and support for the component efforts. The adjustments they made were part of the mutual adaptation process in each site. But by themselves, these adjustments had little cumulative impact on the revision of the approaches. However, the developers learned from the field staff. The developers made changes in the underlying conceptual frameworks, the steps to be followed, and the actual written materials that incorporated modifications made by the field staff and had long term consequences for the approaches.

The Field Staff

Basic Skills. Basic Skills field staff responded to teachers' concern about the time required by the project and lack of interest in fidelity to the original research base. One response was to reduce the time devoted to early phases of the approach. The amount of time for initial observation or data collection could be reduced by cutting the number of observations. As the number of observations was reduced and sampling plan altered, the reliability of results and validity of comparison to reference graphs declined. These changes threatened what Basic Skills staff called the "technical integrity" of the research base--that is, the similarity of the original research procedures to those in the approach.

This threat lessened the extent to which the development group could argue a truth claim for their approach based on the use of scientific procedures (Dunn, forthcoming). However, as noted above, the educators with which the development group worked were more concerned to apply

utility tests than truth tests (Weiss, 1980). Reduction of observation time did not seriously undercut the contribution of training in the approach to teachers' practical knowledge of the importance of time on task. This loss of fidelity to the original research--a form of cooptation--may have contributed to the usefulness of the approach. Teachers observation time could also be reduced by assigning the observation task to administrators. However, where teacher-principal distrust was high, there were serious objections to this approach. Thus, it was difficult to build this strategy into the approach on a uniform basis. Its application became a matter of field worker judgment.

A third way to cut time demands was to shorten training. Generally, teachers were most restive when discussing the conceptual framework and the observation and comparison activities; they were most interested in the identification of new instructional strategies. As necessary, field people made spur-of-the-moment decisions to reduce training on the first two phases to get teachers to materials that engaged their attention.

Career Preparation. While the Basic Skills field staff had to reduce the amount of material presented, those in Career Preparation had to add to it. In keeping with their interest in strengthening local decision-making, the Career Preparation staff originally told school teams that they would take a "back seat" and that "you should treat what I have to say as if I am just another member of the team." However, the field staff quickly moved into a more active role in most sites for two reasons. First, they felt obligated to provide a certain direction to the project by emphasizing a broad definition of career education and by keeping teams within

the general framework of the process model. Second, participants seemed unable and unwilling to shape the development of local projects, partly because they did not fully understand the concept of career education. As a result, field staff helped organize survey results and goal statements and often led team meetings. In one site they actually wrote the project's goals and objectives.

Field people in both development groups also facilitated the use of the approaches by developing positive personal relationships with team members at the site. These relations were used in a number of ways. The field people were able to intervene between teachers and administrators and keep pre-existing tensions from affecting change efforts. They could listen sympathetically to complaints about the approaches, thereby defusing discontent, and they could relay such complaints to developers. This use of interpersonal skills proved to be an important part of the practical knowledge of linkers and helped keep the local projects operating (Corbett, 1980).

Developers

Basic Skills. Basic Skills developers saw the largest changes as "have(ing) to do with the complexity of what we tried to do. We've tried to diminish the time requirements again and again and we are still trying to get them down even further." The simplification took two forms parallel to those initiated in the field. First, the amount of time required for classroom observation was significantly reduced, and a number of alternative plans for scheduling observations were developed to increase flexibility

for observers Second, there was a general trend to simplify and decrease the amount of materials presented to teachers. The group has prepared one set of materials presented to teachers that covers basic concepts and a more elaborate leader's guide. With the help of this guide, an administrator or external helper acting as a leader can supplement the basic materials as needed.

A second change was a more subtle reassessment of how the change process initiated by the approach would work. The original assumption guiding the project was that if teachers would carefully follow the procedures of the approach and if high fidelity to the initial research were maintained, then achievement scores would rise. This assumption is now being supplemented by a newer view that the project is not teaching procedures but concepts. Developers are now stressing that one of the important benefits of the project is that teachers and administrators are developing new "images" of what classrooms with high student engagement look like and as a result are better able to plan. In sum, there is a move towards recognizing and attempting to strengthen teachers' practical knowledge.

Career Preparation. Developers in Career Preparation were spurred to create more materials as a result of responses in the field. Apparently as a result of feedback from field staff, the development group created a set of booklets that presented information on implementing career education projects. These booklets provided a definition of career education and identified strategies for developing and implementing local programs.

Regularities and Variation in the Development Process

Together these case studies suggest that the view that development is a means of putting research into practice massively oversimplifies what takes place. Somehow, through the process of trial and revision, research and practical knowledge are integrated, aggregated, or combined into something new. RBS' recent experience illustrates some of the complexities of the development process that were not considered when large-scale development efforts were first funded by the federal government. It also suggests some regularities and variations in the development process that future developers should take into account.

1. Multiple practical knowledges must be considered in educational development. Teachers, administrators, linkers, and developers all have stores of practical knowledge that can contribute to development. Practitioners' knowledge is part of a larger culture including core understandings and values. This culture is pragmatic, practical, specific, concrete, and personal (Lortie, 1975; Jackson, 1968). It is a necessary basis for day-to-day decision making and helps teachers cope with the exigencies that are often unanticipated by researchers. Teachers' adoption of specific practices and new ways of looking at the classroom and their resistance to more abstract procedures and definitions are all part of a filtering of research-based developments through that culture. The adoptions they do constitute incremental change in that culture.

Field staff also have a practical knowledge, an expertise in group dynamics developed through previous work with the "nuts and bolts" of

implementing projects in schools. This knowledge helps linkers facilitate implementation by anticipating and responding to interpersonal and motivational barriers that develop in the field. Finally, developers have some sense of what works and what does not and of how to organize the development process, all gained from previous efforts. This knowledge is general, but they also know how important it is to create field test situations to develop more specific knowledge about how particular projects work.

2. There may be a "golden mean" in prestructuring development products. Development products are usually modified during implementation (Berman and McLaughlin, 1975). To developers and those concerned with fidelity of implementation, this modification often looks like an adaptation to a school site that dilutes the new contribution the product can make to education. To teachers, this same process may look more like the incorporation of useful ideas and procedures into their fund of practical knowledge and sorting out the dross. Whether what is useful is preserved depends in part on the product and in part on the state of local practical knowledge.

The RBS development groups tried to ensure that local modification of their approaches would preserve the useful contribution inherent in those approaches by building in a role for human agents who understood the approaches and could learn about and adapt to specific local contexts. However, the nature of the two approaches led to different kinds of reactions in the field as well as different kinds of changes through further development. Basic Skills developed highly prespecified procedures for

collecting and analyzing data on instructional processes although it left considerable leeway on what new practices to implement. However, practitioners initially found the procedures inflexible and time consuming. Substantial simplification took place over the two year period. By contrast, Career Preparation consciously avoided elaborate prestructuring. It relied instead on a few precepts, a generalized planning process, and the practical knowledge of its field agents. Field trials indicated substantial confusion among practicioners on what career education was and contributed to increased specification of materials and activities to provide clarity. Together these experiences suggest that some introductory explanation and structuring is necessary, but that balance is required to allow local flexibility without promoting confusion.

Optimal prestructuring of development products will depend in part on the knowledge base available to developers and the way it is to be used. The basic skills area is currently characterized by an extensive body of research on what works, considerable clarity on what intended outcomes should be, and a relatively advanced technology to measure those outcomes. With this large body of knowledge to draw upon, there is substantial basis for prestructuring materials although leeway must be given to allow practitioners to employ their practical knowledge. By contrast, career education and other fields have much weaker bases of research and technology to draw upon although a number of sophisticated programs do exist in these areas. In these areas it seems appropriate to minimize prestructuring to encourage practitioners to take advantage of whatever practical experience they have.

3. Development can be a two-way street. The extent to which a development effort approaches the "one-way" or "two-way" extreme depends on both the mechanisms built in for communication with the field and on the content of that communication. The pure case of one-way communication where information flows only from researchers through developers to disseminators and users is probably rare. The very act of field testing initiates some feedback. The use of formalized instruments--questionnaires to assess user satisfaction and the usefulness of various aspects of a product--is one step towards increasing two-way communication. However, control of the process remains with the developers. Another step is taken as instruments are supplemented or replaced with a human field agent who can identify unanticipated uses, misuses, or problems with a product and be influenced by school people. A field staff can also act as advocates for the schools within the development organization. A final step involving full collaboration is achieved when school people and developers work together directly, sharing the goal of creating a product and responsibility for its accomplishment. RBS' current development effort was at the third level of interaction. A field staff was employed for interaction with schools, but for the most part there were both a clear division of labor and different expected benefits for RBS and cooperating schools.

The content of communication from schools to developers also varies. Any field testing collects information on how understandable and usable a product is and whether it "works"--that is, achieves intended levels of student growth. The knowledge base for the product will still come from the community of researchers and, perhaps, other developers. With

interactive communication between developers and schools, however, educators' practical knowledge can also be identified and built into development products. Then the very substance and design of a product reflects teacher- and administrator-generated knowledge. RBS' current experience suggests that future development work would profit from developing mechanisms that permit cooperating schools to contribute not just information on what works, but also practical knowledge that enhances the final product.

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