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Synthesis of Research on Staff Development: A Framework for Future Study and a State-of-the-Art Analysis

The findings from 30 years of research and practical experience point to the importance of program design in providing staff development that teachers can take back to their classrooms.

O ver the last ten years we have been accumulating a file of research pertinent to staff development with two purposes in mind: (1) to organize the literature to facilitate cumulative research by permitting current studies to build on previous ones, and (2) to assess the research to locate those areas where the findings are firm enough to provide working hypotheses for program design.

Here we describe the nature of the research, present a framework for accumulating it, and discuss selected areas where the research is well developed and others where it appears to be badly needed. As the file develops and analyses of the results are made, the product will be a continuing, regularly updated meta-analysis, with interpretations to guide further research and policy development. A more complete report will appear in *Power in Staff Development Through Research on Training*, second edition. (Joyce and Showers in preparation. See also

The teacher who takes charge of organizing staff development contributes to a productive climate in her district.

> **"... teachers with the most positive self-concepts generated the most individual- and group-governed options and profited most from them, and cooperated enthusiastically with the system-generated options."**

Bruce Joyce, Beverly Showers, and Carol Rolheiser-Bennett, "Staff Development and Student Learning: A Synthesis of Research on Models of Teaching," *Educational Leadership*, October 1987, 11–22.)

Finding and Partitioning the Knowledge Base

Nearly all the research relevant to staff development has been conducted during the last 20 years. In 1957 the authors of the NSSE yearbook on in-service education (Henry 1957) could draw on only about 50 studies, including only a half-dozen experimental studies in the areas of training, curriculum improvement, or the implementation of innovations. Most of the authors suggested areas needing research and squeezed the limited knowledge base for such conclusions as they could warrant.

By 1977 the knowledge base had broadened considerably; but still nearly all the literature was descriptive or conceptual. Only a small proportion of the articles and books either reported research or mentioned existing studies (Nicholson and Joyce 1976).

During the last ten years the amount of research has continued to increase; and the results have been integrated with studies of curriculum and innovation to enlarge the knowledge base substantially (Fullan 1982; Miles and Huberman 1984). In previous reviews (Joyce and Showers 1981, 1983) we found that the number of studies dealing with the acquisition of teaching skills and strategies permitted the development of hypotheses about how teachers acquire teaching skills and strategies, although the number of investigations into how skills are incorporated into the active repertoire continued to be quite small.

Sources of Research

To build the file of research, we pursued the conventional avenues, searching ERIC, dissertation abstracts, indices of pertinent journals, and bibliographies of books and articles. The search included the topics of preservice and inservice teacher education, staff development, curriculum implementation, innovation, school improvement, technological implementation, and training in education, business, and the military. We separated the reports of research from the remainder of the literature. We further sifted them to identify the studies where inferential statistics were or could be used, where there were both experimental and control groups or the baseline data were sufficient that the equivalent of a control had been established, and where the data permitted calculation of effect sizes as well as of statistical significance so that a framework for meta-analytic comparison of treatments could be established.

Researcher- and Practitioner-Defined Issues

We also classified the reports according to the questions asked by the researchers, such as, "How does teaching style affect the ability to acquire various teaching strategies?" This classification enabled us to group the studies that had asked the same or similar questions.

In addition, we examined the non-research literature to identify questions asked by practitioners and the issues and assumptions put forth by staff development personnel, teachers, and administrators. Issues emerged about where training is held (on-site or off-site); who offers service most effectively (can administrators offer training?); and motivation, governance, voluntariness, and timing. Our objective was to determine the extent to which practitioner issues and assumptions had been studied and, where they had, to find out what had been learned, by matching the research with the questions.

Independent and Dependent Variables Studied

We then analyzed the reports to identify the nature of the independent and dependent variables and the ways they were defined and measured in the studies. Showers (Joyce and Showers in preparation) developed a framework for classifying the variables that includes the following categories:

1. *Teacher characteristics*. Teachers bring to staff development their knowledge and skills, their learning and teaching styles, and their personal characteristics such as states of growth, conceptual flexibility, sense of efficacy, and self-concepts. They also bring perceptions about their needs and preferences for certain kinds of staff development. Depending on the design of the study, teacher characteristics can be independent variables, as in McKibbin and Joyce's study (1980) of the influence of states of growth and self-concept on the implementation of skills learned from training, or dependent variables, as in Showers' study (1980) of the influence of social context on efficacious behavior.

2. *Characteristics of schools and school systems*. Schools and systems can be characterized by types of leadership, the cohesion and synergy of their social systems, the governance processes they employ, and their relationships with the communities they serve. These variables can also function as needs assessments, as baselines, and as moderators. For example, the study of cohesion can serve to identify needs, can become a baseline when cohesion is the objective of a program, and can be examined as a moderator when a program interacts with the social system of the school, as when a faculty begins a peer coaching program.

3. *Staff development programs*. Such programs can be defined by the goals and objectives they seek to accomplish, the processes employed in training, and the degrees of their implementation. Their goals can be the source of the dependent variables of an evaluation. In the research literature the major objectives include attitudes toward the training events, knowledge about an approach or theory, and, less often, knowledge of academic content, simple teaching skills, complex teaching skills and strategies, curriculum patterns, and student learning. In the areas of both simple and complex teaching skills, we distinguish those studies that measure the attainment of skill per se and those that measure the extent to which skills are transferred into the active teaching repertoire and employed appropriately.

Training processes are independent variables and include presentations of ideas and information, demonstrations, opportunities for practice and feedback, and follow-up of a variety of sorts by trainers, supervisors, and peers.

4. *Student characteristics*. Students also bring to the educational setting knowledge, skills, and personal characteristics, which can be studied to determine goals and program structure, which can operate as baselines, and which can also moderate treatments.

In the course of implementation of a staff development program or even a specific program element, the variables pertaining to teachers, students, schools and school systems, and programs can be altered. Such alterations can confound research or evaluation. For example, Showers' study (1980) of teacher efficacy found large differences in *opportunity* for school improvement activity, staff development, and participation in decision making among the high schools in a single school district where, officially, available resources were equivalent.

One of the most difficult tasks in determining the state of knowledge in a field is the classification of studies according to the combinations of independent and dependent variables employed. For example, three investigators might employ roughly equivalent types of training, with one measuring only attitudinal outcomes, another measuring both attitudes and skill, and a third measuring skill and transfer. The first might find a large effect on attitudes. The second might confirm

Highlights of Research on Staff Development

A meta-analysis of nearly 200 research studies, plus a review of the literature on staff development, shows that:

- What the teacher *thinks* about teaching determines what the teacher does when teaching. In training teachers, therefore, we must provide more than "going through the motions" of teaching.
- Almost all teachers can take useful information back to their classrooms when training includes four parts: (1) presentation of theory, (2) demonstration of the new strategy, (3) initial practice in the workshop, and (4) prompt feedback about their efforts.
- Teachers are likely to keep and use new strategies and concepts if they receive coaching (either expert or peer) while they are trying the new ideas in their classrooms.
- Competent teachers with high self-esteem usually benefit more from training than their less competent, less confident colleagues.
- Flexibility in thinking helps teachers learn new skills and incorporate them into their repertoires of tried and true methods.
- Individual teaching styles and value orientations do not often affect teachers' abilities to learn from staff development.
- A basic level of knowledge or skill in a new approach is necessary before teachers can "buy in" to it.
- Initial enthusiasm for training is reassuring to the organizers but has relatively little influence upon learning.
- It doesn't seem to matter where or when training is held, and it doesn't really matter what the role of the trainer is (administrator, teacher, or professor). What does matter is the training design.
- Similarly, the effects of training do not depend on whether teachers organize and direct the program, although social cohesion and shared understandings do facilitate teachers' willingness to try out new ideas.

the first, but find only modest effect on skills. The third might confirm the second, but find virtually no transfer. If the second-order analysts do not keep the studies carefully classified according to the independent and dependent variables, their findings can be badly flawed; some purported meta-analyses have drawn erroneous conclusions because of a failure to do so.

Also, the quality of measurement is always important. For example, a researcher who accepts only the frequency of use of a new practice as an indicator of transfer and fails to measure appropriateness of use is also liable to draw erroneous conclusions.

The Chain-of-Effects Problem

As we attempt to reach toward knowledge and interpret it for policymakers and educators, the number of variables and their complexity provide us with a serious problem. Ultimately, at the very least, we need to understand:

● *people*, including how they respond differently to training and how it can be adjusted for maximum comfort and effect;

● *social context*, and how it affects the behavior of people, the implementation of training, and, reciprocally, how training affects social organization;

● *training components*, and how they contribute to the development of knowledge, skill, and transfer, as well as what conditions (including governance, setting, trainers, and shared understandings) affect the ability of programs to achieve their goals; and

● *degrees of implementation*, and how they affect student learning in the personal, social, and academic domains.

A serious weakness in the nonresearch literature is the tendency of the investigators to concentrate on one category of variables at the expense of others. Excessive concentration on a particular teacher characteristic—motivation, for example—without balanced consideration of others can lead to the impression that high motivation solves even such problems as poor training. Similarly, concentration on governance, "buy-in," and leadership can give the impression that the social variables are all-powerful. This does not mean that every researcher has to build all possi-

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ble variables into a design, but interpretation requires that a narrowly focused study be placed in the larger context.

What Is Known: Field-Defined Issues

We will not attempt here to present our entire analysis to date or all the findings relative to the issues. Rather, we will indicate the nature of the knowledge base and how it can be used, present some of the more important results, and discuss how careful evaluation by staff development personnel can contribute to knowledge. We begin with some of the issues derived from the nonresearch literature.

Participatory governance and social context. Teacher involvement in the governance process has been advocated with increasing intensity for the last 15 years (Joyce, Howey, and Yarger 1976). Since few advocates have generated research, only a handful of studies are available; but the results are interesting.

Merton and Yarger (1981) studied federally funded teacher centers, all of which were governed by teachers. Their work clearly indicates that teachers are capable of taking prominent leadership roles in staff development centers and can play the role of organizers and trainers. However, teacher centers generally produced the same types of programs that were being sponsored by education agencies: They ran into the same problems of participation (generally already active

teachers) and "follow-up" (nearly all their offerings lacked provision for coaching or other arrangements to facilitate transfer). In an evaluation of Vancouver's extensive staff development program (teacher-governed, teacher-taught), McDougall (1987) found that transfer depended on the type of training and follow-up rather than upon governance per se.

Berman and McLaughlin (1975), in their oft-cited study of federal programs, provided clear evidence that both leadership and involvement of personnel affected implementation and, therefore, that both "vertical" and "horizontal" solidarity were important. Fullan's synthesis (1982) drove toward the core of that matter, as he stressed that "shared understandings" fuel and sustain innovations, regardless of whether they originate with teachers, building administrators, or the school system. Little's study (1982) illustrated how important social cohesiveness is to the implementation of staff development and school improvement efforts.

In a study of the Urban-Rural School Development Program, Joyce (1978) reported a useful distinction between "structural" or formal parity among teachers, administrators, and community members and "process" parity, whereby the actual governance process provided each "role group" with a voice in the policy chain, from decision making to implementation. The greater the parity in the process, the greater the probability for implementation and for its actualization, including effects on teacher and student behavior.

McKibbin and Joyce (1980) provided the closest to an experimental study of governance when they compared individually governed, group-governed, and system-generated staff development opportunities for a period of four years, with transfer as a dependent variable. They found that teacher characteristics, notably conceptual level, self-concept, and states of growth, interacted with the three governance styles. For example, teachers with the most positive self-concepts generated the most individual- and group-governed options and prof-
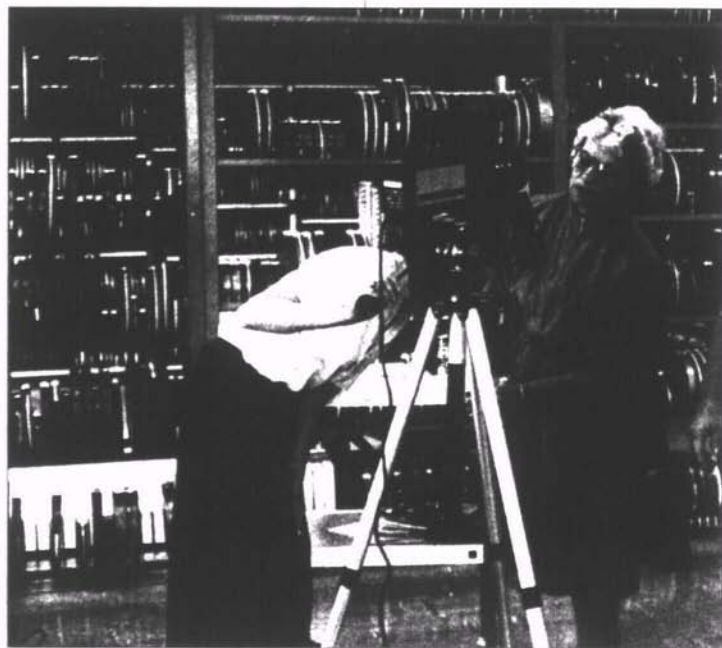
ited most from them, and cooperated enthusiastically with the system-generated options. Persons with weaker self-concepts and lower general states of growth profited little from any of the options. Essentially, effects from governance styles were low, whereas the effects from teacher characteristics were very large: teachers who felt best about themselves transferred nearly seven times more from the content of training than did those whose self-concepts were most precarious.

More work is needed on the issue of governance. We believe that involvement is important and desirable. However, the other categories of variables come into play also, as further discussion will show, and need to be taken into account.

Site of training. Although the literature often mixes site with governance (local people defining local needs and conducting the training they need on *their* own ground), the issue of *where* training is held is frequently mentioned. Again, there are no experimental studies—no one, as far as we know, has randomly assigned people to on- and off-site locations—but there are a good many studies that report where training was held: either at the school where the participants worked or in some other setting. Judging from those studies, site per se is not particularly important. Some of the most and some of the least effective training takes place both on- and off-site (Bennett 1987). We suspect that site is less an issue of effectiveness of training than it is one of convenience and ease of involving participants.

When training is held. The picture is about as above. There are no experimental studies, but there are quite a few representing almost all conceivable time combinations with respect to time of year and day. The training schedule does not appear to matter as much as the substance, process, and social context do (Bennett 1987).

The role assignments of trainers. Are teachers the most acceptable trainers? Can administrators or supervisors combine the role of formal leader and evaluator with that of trainer? Can professors be effective? Can researchers be coaches? Although we believe

Learning to use a video camera, a teacher can see how it really works when she watches a demonstration.

that the processes of evaluation should be separated from training for several reasons (Joyce and Showers 1987), effectiveness as a trainer does not appear to be role-connected. Training design is, however, very important (see below) and may reflect on the trainer. We can almost conclude that the "good" trainer, rather than coming from one or another population of potential trainers, is one who has a good design and knows how to use it.

Voluntariness and "buy-in." Much of the practitioner-generated literature manifests deep concern with the extent to which participants select and believe in the training they will receive. An experimental study is badly needed in this area, because the concern is heartfelt. The McKibbin-Joyce study cited above is the closest to an experimental study; it found that personal characteristics and quality of training overrode the governance options (individual, collective, and sys-

tem-directed). Fullan's analysis (1982) supports the function of organizational solidarity, as does the work of Berman and McLaughlin (1975) and Little (1982).

However, the real news comes from studies by Crandall and others (1982), particularly the aspect reported by Miles and Huberman (1984), who found that commitment *follows* competence, rather than preceding it. Essentially, without extensive training, persons do not have sufficient knowledge or experience to "buy in." Once they develop skill and learn to use it, they reach a position where they *can* make a decision.

Further, Showers' study (1982), in which participants were brought to a level of skill where they could practice several models of teaching effectively and then assigned to different training conditions, indicated clearly that attained level of skill, enthusiasm for the innovation, and voluntariness were

not, even in combination, sufficient to sustain practice until transfer occurred. But the training condition of coaching *was* effective for teachers of different levels of initial skill and commitment.

Obviously, enthusiasm helps. However, competence may be a precondition for commitment. Precompetence "commitment," while it may make for more pleasant initial training sessions, may not be a substitute for appropriate training components. From our own ideological position, people *should* be involved in the social process that surrounds training and *should* be dealt with as people whose opinions matter. The data suggest, though, that initial enthusiasm is not a critical factor.

The situation may be analogous to skiing. Until you are good at it, how can you possibly like it? When you are good at it, you may very well find that, against all odds, you do like it. But, at that point, you can elect to participate or not, as you compare it to other options, from a strong position. In terms of professional practice, of course, a dispassionate approach may be most appropriate. If a given teaching strategy *works* and increases student growth, our predispositions may not be as important as we thought. Possibly a general commitment to students may be more important than a prejudgment that we will prefer the teaching strategies when we have mastered them.

It has been well established that nearly all teachers *can* learn a wide variety of teaching approaches and that "natural" teaching styles do not dictate future repertoires (Joyce, Peck, and Brown 1981); it need not be assumed that initial attraction for a relatively minor outcome of training such as a single teaching strategy will be definitive. A disposition toward growth in general, however, may be very important, as we will see in the next section.

Personal characteristics. Both practitioners and researchers have long been concerned with individual differences in response to training and have searched for ways of predicting how people will respond to opportunities to learn. Probably because of the tradition of using norm-referenced achievement tests whose scores are so much predicted by social status and measures of academic aptitude, educators often assume that individual characteristics will have great influence on learning. Therefore, the literature is replete with the assumption that if people are highly motivated, flexible, and good "risk-takers," then the results of training will be positive.

Research on conceptual flexibility (Harvey, Hunt, and Schroeder 1961) supports the assumption that conceptual flexibility influences the variety of teaching strategies that people develop naturally (Hunt and Joyce 1967, Brown 1967, Sprinthall and Thies-Sprinthall 1983) and the ease with which they acquire new repertoires (Joyce, Weil, and Wald 1973) and transfer new skills into their active repertoires (Showers 1984). Conceptual flexibility also influences the general response to training, including requests for assistance (Calhoun 1985), as well as the response to opportunities for growth.

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Rarely has the effect of self-concept on transfer of training been investigated; but when it has, self-concept has been found to be a strong influence on the ability to "drive" new teaching skills to the point of implementation (McKibbin and Joyce 1980).

Individual teaching styles, as well as the value orientations of teachers, appear to be independent of ability to learn new teaching skills (Joyce, Peck, and Brown 1981). Personal motivation to grow does affect response to training, although it does not suffice for adequately designed training.

Despite gaps in the knowledge base and the remarkably low incidence of studies investigating the variables in which practitioners have an investment, we think it is a safe bet to:
- involve teachers in all aspects of governance;
- expect differential responses to any training option but have confidence in carefully selected substance and carefully designed training;
- build strong organizational contexts to support training;
- assume that role designation has little to do with competence as a trainer; and

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> **". . . the observable interactive behaviors of teaching . . . are directed by thoughts about what to do, when to do it, and why it will have an effect."**

• worry little about where training is held or when, as long as all personnel are involved in the selection of times and places.

What Is Known: Researcher-Defined Issues

Nearly all the researchers have studied questions pertinent to the design of training. We believe that the purpose of training design is to create the conditions under which sufficient levels of knowledge and skill are developed to sustain practice and to provide the conditions that support practice until executive control has been achieved and transfer has occurred.

The body of research includes studies that explored the effects of both single training components and various combinations of them on knowledge, skill, and transfer. When our collection is complete, there will be about 200 usable studies. Our current file probably contains 80 to 90 percent of the studies done since 1960; from these we have identified topics receiving different degrees of attention and some clearly discernible trends in the findings that can inform future research and practice.

First, relatively simple teaching skills and behaviors (such as questioning and giving feedback) have received much more attention than have teaching strategies and curriculum implementation. Teaching skills have much more often been the objectives of training than have academic content and its role as a component of teaching competence. Second, manifestations of visible behavior have been studied much more than the intellectual aspects of teaching, such as the appropriate use of a skill or strategy. In addition, only a dozen or so studies

The presentation of theory is the first element of successful training, shown here by naturalist Phil Haas's discussion on amphibian egg masses in a pond at Hawk Mountain.

Photograph by Carl A. Hess

To ensure that new procedures transfer to the settings where they are needed, the learner must practice again and again with feedback from her coaches.

have included transfer, or the incorporation of skills, strategies, and curriculum patterns into participants' active teaching repertoires. Nearly all of these have been done in the last ten years, moreover, as researchers have realized that studies that stop short of transfer can be misleading. We will begin with the most general findings and proceed toward the more specific ones.

The first message from training research is that the important components of teaching practices are cognitive in nature. That is, the observable interactive behaviors of teaching, while important (they are what the learner perceives and responds to), are directed by *thoughts* about what to do, when to do it, and why it will have an effect (Joyce and Showers 1987, Chapter 8). Research on the processing of information while teaching indicates that the intellectual processes of selecting teaching practices, adapting instructional materials, "reading" the students' responses, and modulating environments to generate student learning energy are the critical elements that determine whether a teach-

ing practice will have effect (see, for example, Dalton and Dodd 1986, Showers in press).

Thus, the purpose of providing training on any practice is not simply to generate the external visible teaching "moves" that bring that practice to bear in the instructional setting but to generate the cognitions that enable the practice to be selected and used appropriately and integratively. As we examine the effects of training components on the acquisition of knowledge, skill, and appropriate use or transfer, therefore, we have to remember that these variables cannot be meaningfully separated in practice. Separating them is useful only as we accumulate research and try to determine how training components contribute to each of them. The understanding of any given practice, the skill required to generate the interactive moves necessary to employ that practice, and the cognitions necessary for appropriate and integrated use—all blur together as the objectives of training.

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is cognitive in nature. Moreover, this interpretation of the research has important implications for the design of training. Each training component contributes to the acquisition of knowledge, as can be seen from the effect sizes when the components are used together. Where information-only training is used, the average effect size on knowledge acquisition is modest, about .7. When presentations, demonstrations, and opportunities for practice and feedback are combined, the effect on measures of knowledge averages about 3. Observing demonstrations and practicing apparently add dimensions of understanding to the study of teaching skills and strategies and curricular patterns. As Good (1986) has pointed out, even those teaching skills that appear superficially quite simple require more extensive training than was previously thought.

For the researcher, this finding creates the necessity of not only determining whether the visible interactive behaviors are present but measuring knowledge and its use. The researcher cannot simply "count" the occurrence of behaviors as evidence that skills have been acquired and can be used appropriately.

Combinations of four components (theory, demonstration, practice, and feedback) appear necessary to devel-op the levels of cognitive and interactive skills that permit practice in the classroom. For most teachers, even combinations such as demonstrations along with the study of theory do not appear to produce high enough effects to sustain classroom practice, unless they also have the opportunities to practice in the training setting. However, in a number of studies (Joyce, Weil, and Wald 1973; Brown 1967; Reid 1975; and Showers 1984), the theory-demonstration-practice-feedback combination produced effect sizes often in excess of 10, enabling virtually all teachers in the studies to reach levels of skill that could sustain classroom practice in sets of complex models of teaching. This finding has quite optimistic implications, for it indicates that appropriately designed training enables teachers to display their considerable learning capability. While research can no doubt improve training design greatly, current tools can enable teachers to increase their repertoires dramatically.

Of course, sustained practice in the classroom is necessary until transfer is achieved, or there will be an erosion of the cognitive and interactive skills necessary to implement the practice. For a complex model of teaching, we estimate that about 25 teaching episodes during which the new strategy is used are necessary before all the conditions of transfer are achieved. Once this condition is achieved, further practice can elaborate the skills and maintain them; but they will not be lost though disuse, although they may get "rusty" and need practice to recover their former vigor.

Skill developed in training does not appear sufficient to sustain the practice until transfer is achieved. Rather, nearly all teachers need social support as they labor through the transfer process. Expert coaches can provide the support, but peer coaches can also. Effect sizes of the studies that have used some form of expert or peer coaching average about 1.3, exclusive of Showers' effect of over 26 where the transfer measure included appropriate use of a set of instructional models (Bennett 1986). Again, the message is an optimistic one, since it appears that the coaching process enables nearly all teachers to sustain practice and gain executive control over a large range of curricular and instructional practices.

Present Practice and Future Policy

Surveys of staff development practice (Joyce, Howey, and Yarger 1976; Joyce, Bush, and McKibbin 1982; Merton and Yarger 1981) confirm the complaints of teachers, principals, and central office personnel that only a small proportion of programs combine the necessary components to develop skill or engender the "follow-up" that sustains practice to the point of transfer. As a result of the consistency in the findings from the research, however, staff developers can proceed fairly confidently to remedy these deficiencies.

Whether relatively simple teaching skills or complex curricular or instructional models are the object of training, the same components appear to

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increase knowledge, skills, and the probability of transfer. Not insignificantly, the study of attitudes toward training indicates that the greater the increase of knowledge, skill, and transfer, the more positive are teachers' attitudes toward the training. Stronger training, combined with involvement-oriented governance and the positive effects of active organizational leadership, can lay the basis for some very effective staff development programs.

Also, studies of teaching indicate, as Sirotnik (1983) has pointed out so clearly, that most teachers depend heavily on the recitation pattern of teaching. There is a large reservoir of teaching skills and strategies that promise much greater effects on student learning than does recitation as currently practiced (Joyce, Showers, and Rolheiser-Bennett 1987; Joyce and Showers 1987). Using the findings reported here, staff development can make a substantial contribution to the improvement of our schools, including the achievement and learning capability of our students.□

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