

# Designing Effective Professional Development Experiences: What Do We Know?

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# Designing Effective Professional Development Experiences: What Do We Know?

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## Background

Educators across the country have realized that improving teacher quality is a vital component of any strategy to create high-performing schools. Value-added studies in Tennessee by Sanders and Rivers (1996) demonstrate that children assigned to three effective teachers in a row score up to 30 percentile points higher on math assessments than children assigned to three ineffective teachers in a row. Clearly, designing strong professional development programs is essential to improving teacher quality. But, despite a wealth of information on professional development, schools are often not sure how to proceed.

According to evaluation expert Thomas Guskey (2000), effective professional development planners use “backward planning.” They first determine the student learning outcomes or goals that they want to achieve. This in itself is no small feat; it requires data collection and analysis and the input of a potentially wide range of stakeholders including teachers, students, parents, and administrators. But once this important step has been taken, the next question is often “How?” How do we improve teachers’ ability to teach early literacy skills? How do we improve their content knowledge so they can expose students to more challenging mathematical concepts in middle school? How do we improve their willingness to introduce problem-solving activities into their science courses? This is the “how” of professional development, and involves making a number of choices including, ultimately, what kind of experiences will motivate and enable teachers to acquire the knowledge and skills they need to implement the new practices.

Decisions about what experiences will be most effective should be largely driven by context. Planners need to consider financial resources, available personnel, and school culture as they determine what type of activity is best suited to a particular school and faculty. One set of teachers may be motivated and engaged by an action research project, for example, while another set of teachers might get more involved in collaboratively designing and implementing a new curriculum.

But what do we know about how well different professional development activities work? Available research does not provide clear answers, although it does suggest some guidelines that can help teachers and administrators design effective professional development. Ultimately, research suggests that the underlying *characteristics* of an activity—particularly whether it is focused on the content that students will need to know and whether it is coordinated with an overall school improvement effort—are more important than the *type* of activity that is chosen. For many professional developers who begin their planning by deciding on the type of activity they will use, this represents a radical shift in the typical design process.

## Research

In the last two decades, researchers have focused a great deal of attention on professional development. Much of the writing has been case studies of individual schools or districts with promising programs (e.g., WestEd, 2000) or authors’ summaries of lessons learned from years of research and experience (e.g., Darling-Hammond & McLaughlin, 1996).

But a growing body of research has focused on large-scale surveys of teachers about their professional development experiences (e.g., Parsad, Lewis, & Farris, 2001; Porter, Garet, Desimone, Yoon, & Birman, 2000; U.S. Department of Education, 1999). Most of this research rates professional development as “effective” when it leads to desirable changes in teaching practices. But a small number of studies seek to hold professional development to a higher standard of effectiveness, linking its elements with improved student achievement (e.g., Weglinsky, 2000; Cohen & Hill, 1998; Kennedy, 1998).

Collectively, this research has identified certain characteristics of professional development activities that influence whether or not participants achieve their stated goals. The following synthesis of effective characteristics draws most heavily on the work of Garet, Porter, Desimone, Birman, and Yoon (2001).

### **Framework**

After surveying a nationally representative probability sample of more than 1,000 teachers who participated in professional development sponsored by the Eisenhower professional development program, Garet et al. (2001) examined the relationship between characteristics and teacher outcomes while holding other variables constant. In their analysis, they examined both structural and “core” features to determine how the form and content of professional development activities influence teacher-reported outcomes. In this framework, activities have the following characteristics:

#### *Structural features:*

- Form (Was the activity presented as a “reform” activity such as a study group or network, or as a traditional workshop or conference?)
- Duration (How many hours did participants spend and over what span of time did the activity take place?)
- Participation (Did groups from the same school, department, or grade level participate collectively, or did teachers from different schools participate individually?)

#### *Core features:*

- Content focus (To what degree did the activity focus on improving and deepening teachers’ content knowledge?)
- Opportunity for active learning (What opportunities did teachers have to become actively engaged in a meaningful analysis of teaching and learning?)
- Coherence (Did the activity encourage continued professional communication among teachers, and was the content in alignment with state standards and assessments?)

## **Form**

Numerous researchers have documented the ineffectiveness of traditional professional development activities. Teachers have typically experienced these activities in two ways: Either they attend inservice days sponsored by their districts in which they are offered a menu of training options designed to transmit a specific set of ideas, techniques, or materials (Little, 1993), or they attend courses taught by university-based teachers with an academic rather than an applied focus (Stein, Smith, & Silver, 1999). Research has shown that neither of these approaches leads to substantive and sustained changes in teacher practice (Parsad et al., 2001; Porter et al., 2000).

In contrast, “reform” activities such as study groups, teacher networks, mentoring, coaching, and other collaborative endeavors are believed to have more success changing teaching practice (Darling-Hammond, 1996; Little, 1993; Richardson, 1994). In their study documenting the effects of different characteristics, Garet et al. (2001) found a modest direct effect of activity type on enhanced knowledge and skill, indicating that reform activities have slightly more positive outcomes when all the other quality characteristics are included. However, they believe that these activities are more effective primarily because they are longer and, therefore, have some of the other core features such as content focus and active learning. When traditional formats such as workshops and institutes are longer, they too have better core features and are just as effective.

## **Duration**

There is some evidence that when teachers experience professional development over a longer period of time, it has more effect on their teaching. A U.S. Department of Education (1999) survey of the Eisenhower professional development program found that when teachers report that their activities extended over a longer period of time, they cite more improvement in teaching practice. One explanation for this may lie in how duration interacts with the core features of an activity. Garet et al. (2001) found that activities of a longer duration have more subject-area content focus, more opportunities for active learning, and more coherence with teachers’ other experiences. Kennedy’s (1998) review of existing research confirms that duration alone is not enough to ensure success. She found that variations in content have a stronger effect than whether the program takes place over time. Differences in contact hours suggest that this variable in and of itself is less important than the content of what is actually taught.

## **Participation**

In the 1970s, researchers interested in school effectiveness consistently noted the importance of having a climate that promotes and supports collaborative planning and collegial relationships (Berman & McLaughlin, 1977; Venezky & Winfield, 1979). In the past two decades, researchers have looked more deeply into the question of school culture. A growing consensus has emerged in the field of professional development that planners need to move teachers away from traditional patterns of isolation and privacy and toward a new conception of teaching in which collaboration and shared inquiry are the norm.

The limited amount of research into the effects of collective approaches to professional development has shown some promise. McLaughlin and Talbert (1993) found in a five-year case study of nearly 900 educators that teachers who belonged to strong professional communities were better able to adapt to the challenges of teaching today's students. Also, in a study of 24 schools in the midst of "restructuring," Newmann (1996) and associates found that in the more successful schools professional development was targeted toward groups within the school rather than individual teachers. They also noted that in the more successful schools professional development planners used a combination of local and external expertise.

### **Content Focus**

A few researchers have expressed surprise at the dearth of information about the content of professional development programs. Kennedy (1998) notes that there is a large body of literature on professional development, but most of it focuses on structure rather than content. Nevertheless, a strong body of research has recently emerged focusing on the effectiveness of professional development activities that focus on subject-matter knowledge and student learning of a particular subject matter.

Kennedy's (1998) review of the effect of math teacher inservice programs on student achievement found that programs that focus on subject matter content and how students learn it had the largest positive effect on student learning. Garet et al. (2001) also note that content-focused activities had a substantial positive effect on enhanced knowledge and skills, as reported by the teachers in their sample.

Further evidence for professional development that is content based was recently presented by the assistant secretary for research and improvement at the U.S. Department of Education. Whitehurst (2002) stated that out of seven teacher characteristics that could increase achievement, participation in professional development that is focused on academic content and curriculum was second only to a teacher's cognitive ability. He included in his review Cohen and Hill's (1998) study of mathematics teaching in California, which found that, controlling for the characteristics of students enrolled, average mathematics achievement was higher in schools where teachers had participated in professional development focusing on teaching specific mathematics content, compared to the achievement in schools where teachers had not. "The things that made a difference to changes in their practice were those things that were integral to instruction: curricular materials for teachers and students to learn in class, assessments that enabled students to demonstrate their mathematical performance—and teachers to consider it—and instruction for teachers that was grounded in these curriculum materials and assessments" (Cohen & Hill, as cited by Schmidt, Houang, & Cogan, 2002, p. 14).

### **Active Learning**

In their study of the effects of different characteristics of professional development and how they influence teacher practice, Garet et al. (2001) found that opportunities for active learning had a small positive effect on teachers' knowledge and skills. Further research is needed, but several observers have documented that when teachers have the opportunity to become actively engaged in their own learning through observations, close study of

student work in collaboration with colleagues, and joint curriculum planning, for example, they are more likely to improve their practice (Lieberman, 1996; Loucks-Horsley, Hewson, Love, & Stiles, 1998).

## **Coherence**

One of the criticisms often leveled at traditional professional development programs is that the activities are not part of an overall improvement strategy. If teachers experience professional development as disconnected from the state and local standards that students must meet, then they are unlikely to feel committed to making changes in their practice. On the other hand, a few studies support aligning professional development with broader change efforts. One national survey of teachers finds that when teachers report a connection between professional development and other school improvement efforts, they are more likely to say that professional development has improved their teaching practice (Parsad et al., 2001). This is borne out by a study of exemplary organizations in both the educational and private sector that found that professional development was most effective when “coordinated with organizational goals” (Laine, 2000). Garet et al. (2001) also found that the coherence of professional development activities has an important positive influence on change in teaching practice. Most recently, a new study just released by the Council of Great City Schools looked at four urban school systems that are raising academic performance and reducing the achievement gap. Among the similarities the study found, districtwide professional development for teachers and staff on implementing a coherent curriculum was listed as one of nine key characteristics (Snipes, Doolittle, & Herlihy, 2002).

## **Impact of Characteristics**

Although the research base is by no means robust, there is growing evidence that certain structural and core features of professional development activities do have a positive influence on teachers’ enhanced knowledge and skills, practice, and even, in a few cases, on student achievement. The most consistent finding is the importance of subject-matter focus and the need to link professional development activities coherently with other reform efforts. The duration of an activity is also important, although the benefit there seems to derive from the fact that longer activities are more likely to promote coherence, to encourage active learning, and to emphasize content knowledge.

In addition, the type of activity (reform versus traditional) also has a modest effect, although again it may be because reform activities are likely to be longer and have the other features. There is also some research support for designing an activity for teams of colleagues if it promotes the kind of collaboration that seems to exist at effective schools. Designing an activity with an active learning component has shown a modest effect in one study as well.

So, several different types of activities have *potential* value—if they are designed and implemented to have the characteristics of high-quality professional development. With that in mind, a discussion of the research that exists on specific types of activities follows.

## **Research Base for Specific Types of Activities**

In *Designing Professional Development for Teachers of Science and Mathematics*, Loucks-Horsley et al. (1998) provide a list of types of activities and offer a substantial amount of information about how to implement them effectively. They also refer to the research base that exists to support each of the various types of activities. In many cases, this is not particularly strong. Some types of activities, for example, are supported only by examples of individual schools that have implemented this type of activity and had positive reactions from teachers. In these accounts, it is difficult to isolate what effect activity type has had on outcomes in the context of the overall school improvement effort. Several other studies document the effect of individual programs. In these accounts, the authors rarely attempt to isolate the effects of different variables (activity type, content, quality of implementation, and others) on outcomes related to teacher behavior or, in some cases, student achievement. Nevertheless, because many of these activities do incorporate some of the features listed above, they show promise and might be very successful in a particular context.

In the latest edition of their book *Student Achievement through Staff Development*, Joyce and Showers (2002) offer a useful framework for examining the “context” of a professional development initiative. They propose that, as a first step, designers determine how much change they expect teachers to make as a result of their participation. Joyce and Showers (2002) describe various potential outcomes or levels of impact as follows: (1) teachers gain knowledge or awareness of educational theories and practices; (2) teachers change their attitudes, whether it be about their own ability, their students’ potential or a particular subject; (3) teachers develop discrete skills such as more effective questioning techniques; and (4) teachers experience “transfer of training,” in other words, they can implement and use a new instructional method in the classroom and measure its effect on student learning. According to Joyce and Showers’ (2002) model, all outcomes are potentially useful in different circumstances, but it is only the last outcome that can influence and improve student achievement, because it is only the last one that changes the conditions in a classroom so that increased learning can occur. Determining the outcome a particular professional development strategy needs to meet is the first step in enabling the designer to then select activities with the most potential for meeting that objective.

The next section outlines the research base that exists for individual types of activities. The activities listed are those that could potentially incorporate the characteristics listed above and could enable teachers to change the learning environment in such a way that increased learning occurs, as described by Joyce and Showers.

### **Immersion**

Immersion activities offer a structured opportunity for teachers to gain practical experience by working in nonacademic settings. Most participants are science and math teachers who spend time over the summer working in laboratories, with research groups, and in museum research departments (Loucks-Horsley et al., 1998). There are several initiatives around the country, many sponsored by private industry, that have had positive

results. Participants in the Growth in Education through a Mathematical Mentorship Alliance (GEMMA) project in Dayton, Ohio, for example, report that they have made changes in their classrooms as a result of their participation—particularly in the examples that they use and the degree of problem solving they encourage (Farrell, 1994). Because the cost is prohibitive, relatively few people participate per year in immersion activities from a given school or district. More research is needed to determine if participation has a positive impact on student learning and on the larger school community.

### **Involvement With Curriculum**

Selecting or implementing a new set of curriculum materials can be a powerful form of professional development, partly because it has one of the key characteristics listed above: It is focused on the content that students need to know. When the effort is well designed—meaning that teachers are given the time to research, practice, try out, and then reflect on the effectiveness of high-quality materials—teachers are often astonished at improvements in student learning. This evidence of impact on student learning is a powerful motivator for teachers to change their own teaching practice to incorporate the new instructional strategies inherent in the well-designed materials. A study by Ferrini-Mundy (1997) examining how new mathematics standards influenced several districts found many examples of teachers whose attitudes toward new teaching behaviors were more positive once they observed their students learning.

Another study by Cohen and Hill (2001) looks specifically at the effects of a curriculum replacement strategy in California. Having failed to convince textbook publishers to offer teachers more guidance in implementing state mathematics standards, state reformers developed “replacement units” on specific topics like fractions. They introduced these units in 2½-day-long sessions in which teachers could do the mathematics themselves, talk with each other, and examine student work. The authors found that these opportunities increased teaching practices associated with the new frameworks and decreased use of conventional methods, thereby changing their core teaching approach. More research is needed to determine if these approaches are equally as effective in other disciplines, and to see if they have a positive effect not only on teacher behavior but on student learning as well.

### **Workshops/Institutes/Seminars**

According to Garet et al. (2001), 79 percent of the teachers they surveyed in California who participated in professional development activities participated in what they refer to as “traditional” forms of professional development: workshops, seminars, and institutes. This confirms the findings of other researchers who maintain that most teachers experience professional development in this form. Unfortunately, many of these training experiences take the form of “one-stop” workshops with little follow-up, are fragmented rather than coherent, and are not connected to the content students are expected to master (Parsad et al., 2001; Cohen & Ball, 1999; Porter et al., 2000). Consequently, they have little impact on teaching and learning (Parsad et al., 2001). But when workshops are built into a long-term professional development plan with follow-up time regularly scheduled for discussion and reflection, or when they are designed as part of a larger professional

development plan that includes other types of activities such as curriculum modification or case discussions (Loucks-Horsley et al., 1998), they can have an impact on both teacher practice and student achievement.

In a survey of professional development programs that appear to have a positive effect on the achievement of middle school students, Killion (1999) and her colleagues at the National Staff Development Council found that most of the 26 programs that met their criteria for inclusion rely heavily on the training model, often conducted in the form of summer institutes. One such program is Project CRISS (CREating Independence through Student-owned Strategies). Based on principles of cognitive psychology and reading, the program is designed to improve students' reading and writing skills across all disciplines. Teachers participate in an initial training session in which they have an opportunity to learn the underlying theory, to see models of the teaching strategies in action, and to incorporate the strategies into their own curriculum materials. There is a follow-up session after a few months, and a district facilitator is available to support teachers and to serve as a liaison between the program staff and the local school or district. In evaluation studies, students whose teachers participated in Project CRISS training demonstrated significantly greater gains in the retention of subject-specific information than comparable students who did not participate in the program. Teachers were randomly assigned to the treatment or control group.

A study of approximately 1,500 Ohio math and science teachers who participated in a six-week summer institute focused on using inquiry-based instructional methods showed similarly positive results (Supovitz, Mayer, & Kahle, 2000). Using growth-curve modeling, a statistical method that is designed to accurately measure growth over time, the authors examined teacher surveys to determine whether teachers' attitudes and use of inquiry-based methods increased over a four-year time span. The professional development program began with the six-week summer institute but was also designed to provide ongoing follow-up. Participating teachers had six days of follow-up activities throughout the school year, and a network of fellow participants to use as resources at any time. They also had the ongoing services of regional leadership teams who conducted on-site visits and were available for on-demand support. According to the authors, the attitudes, preparation, and practice of participants showed substantial and statistically significant gains in the first year that were sustained over the next three years. Further studies are forthcoming that look at the impact the program has on student learning (Supovitz et al., 2000).

## **Action Research**

Based on the assumption that teachers will grow professionally if they can generate and investigate questions about their own practice, action research is a strategy with a long and varied history (Loucks-Horsley et al., 1998). First introduced formally in the 1940s, action research has had surges of popularity as teachers have sought to be active participants in their own professional growth. Much has been written outlining how teachers should implement a thoughtful action research plan, but most guides follow a similar plan: (1) select a problem to investigate that is relevant to your own and/or your colleagues' instructional practice; (2) collect and interpret information related to the

problem; (3) study the relevant professional literature; (4) determine what action you need to take; and (5) take that action and document the results (Calhoun, 1994).

Individual case studies document positive changes in teacher behavior and attitudes when teachers participate in action-research projects. Sparks and Simmons (1989) report that teachers who have participated in action research are more reflective and more attentive and responsive to student learning. In their study of high schools that are members of the Coalition of Essential Schools, Wasley, Hampel, and Clark (1997) found that the ability of individual faculty members to engage in critical self-examination was a determining factor in schools that had widespread improvement. In less successful schools, faculty members focused on logistical issues rather than on issues related to student learning. More research is needed to see if action research can have a long-term impact on teachers' instructional practice.

### **Case Discussions**

Case discussions offer teachers an opportunity to reflect on the teaching and learning process by examining a story or videotape that captures a particular classroom experience (Loucks-Horsley et al., 1998). There are many different types of cases. Some focus on student learning, others on how teachers respond to a challenging situation. Although they can be read or viewed alone, most researchers agree that a key to their impact is the discussion among colleagues that takes place following the presentation or reading. When they are well written and facilitated, case discussions encourage participants to look deeply into how instructional practice influences and interacts with student thinking.

One of the best known case discussion initiatives is housed at WestEd, a federally supported education laboratory in San Francisco. The Mathematics Case Methods Project is structured so that groups of six to twelve elementary and middle school teachers from the same school meet monthly for a few hours to discuss a case. Evaluations document how participation has influenced teaching practice. According to Barnett and Friedman (1997), the case discussions have been an impetus for changes in teachers' beliefs about how children learn and how mathematics should be taught, have increased teachers' content knowledge, and have led to changes in teachers' instructional practices. More research is needed to determine if case discussions have a long-term effect on teaching practice, and if they influence student achievement as well.

### **Study Groups**

Study groups vary in size, but they typically involve groups of teachers from the same discipline, school, or district meeting regularly over a significant period of time to explore some topic of mutual interest related to teaching and learning. Topics range from how to implement a recently learned strategy to discussions of recent research and its relation to classroom practice. According to Susan Loucks-Horsley, the key elements of this strategy are that the topic is important to the participating teachers, that teachers have ongoing time to meet, and that teachers have a process for how to address the topic raised (Loucks-Horsley et al., 1998).

Although there are several useful guides that describe how to form and implement study groups, little research exists documenting their effectiveness. A study of ten elementary teachers in Cleveland who formed a study group called Journeys—which met regularly for four years to explore issues related to their science teaching—found that the group caused them to critically examine their own teaching, their content knowledge, and their assumptions about student learning (Loucks-Horsley et al., 1998). Several studies exist that document similar results at individual schools (Loucks-Horsley et al., 1998). More research is needed to determine whether well-designed study groups have a consistent, positive effect on teacher practice and to see if they impact student achievement.

### **Examining Student Work**

Giving teachers opportunities to closely examine student work in collaboration with their colleagues has the potential to be a very powerful professional development activity. Any type of assignment can be used, as long as it is detailed enough to offer insights into students' thinking. Because this strategy focuses directly on student learning, it forces teachers to recognize the discrepancies between what they think they have taught and what students seem to have learned. In order for teachers to get the most insight into how to analyze and respond to student thinking, it is helpful for teachers to have the support of someone with content expertise (Loucks-Horsley et al., 1998).

Few formal studies exist documenting the impact that examining student work has on teacher behavior and student achievement. An exception to this is the Cognitively Guided Instruction (CGI) project at the University of Wisconsin–Madison. After analyzing the development of children's mathematical thinking in the early grades, researchers Carpenter and Fennema developed a professional development program designed to share their findings with teachers. Through close examination of student work and through videotapes of lessons in which students explain their thinking, teachers are encouraged to think hard about the relationship between this new knowledge and their own teaching (Carpenter, Fennema, Franke, Levi, & Empson, 2000).

In several different studies that explore how CGI affects teachers' knowledge, their instruction, and student achievement, the results have been very promising. In both an experimental study comparing participants with a control group, and a longitudinal study examining how participants' teaching changed over time, researchers found that CGI teachers had higher expectations and knew more about their students' thinking. In addition, they found that students in CGI classes had significantly higher levels of achievement in problem solving than control classes had, and also scored as well on tests of number skills (Carpenter et al., 2000). Case studies confirm that teachers attribute changes in their practice to the process of thoroughly examining student work. More research is needed to see if efforts in other disciplines produce similar results.

### **Coaching and Mentoring**

Loucks-Horsley et al. (1998) draw a distinction between coaching, which refers to classroom observations by peers, and mentoring, which refers to observations and support offered by a more experienced adult to a less experienced adult. In both

examples, participants typically use a model of preconferencing, observation, and postconferencing. The purposes of coaching and mentoring are similar: to help teachers focus on and improve their practice by discussing it with other individuals. In order to be successful, coaches and mentors need to have a good working relationship, they need some skill in communication and observation, and they need time to develop an understanding of each other's strengths and to try out new practices (Loucks-Horsley et al., 1998).

In a study of a university-based program at Georgia State University designed to help math teachers implement the National Council of Teachers of Mathematics standards, researchers found that the yearlong peer-coaching relationship as described by Loucks-Horsley improves teachers' content and instructional knowledge and provides them with a support structure that facilitates risk taking in the classroom (Loucks-Horsley et al., 1998).

In their earlier studies of peer coaching, Joyce and Showers (1988) experimented with a form of coaching similar to the one described by Loucks-Horsley above. They developed a training design that began with modeling and practice under simulated conditions, followed with classroom practice supported by feedback from a more experienced colleague. The purpose of these initial studies was to look at whether coaching helped facilitate the use of new skills. Following 30 hours of initial schoolwide training in a new instructional strategy, the treatment groups engaged in ongoing peer coaching, while the control group did not. Joyce and Showers (1988) found that the coached teachers practiced the new strategies more frequently, adapted them to other contexts, and used them more appropriately than the uncoached teachers. In addition, students of coached teachers were more likely to understand the nature and definition of new concepts and to use them independently.

More recently, Joyce and Showers (2002) have broadened their definition of what constitutes "coaching." Their experience in schools and their more recent research have convinced them to redefine the peer-coaching process in schools. First, they now expect *all* teachers and administrators in a school to participate in peer-coaching teams. Second, they have eliminated feedback as a coaching component. The primary activity of peer-coaching study teams in the schools they now work with is collaborative planning and development of curriculum and instruction that meet specific goals for student learning. According to their more recent research, omitting feedback in the coaching process has not hurt implementation or student growth (Joyce, Calhoun, & Hopkins, 1999; Showers, 1989). Third, when classroom observations occur, it is the teacher who is the "coach," helping the observer to learn from the teacher's efforts to adopt a new behavior. Results with this new type of coaching have been impressive. While studies of training sessions that include presentations, demonstrations, and practice sessions have shown no effect on transfer to the workplace, studies that examine the effect size when regular peer coaching is added to these other components have demonstrated a large increase in transfer of training.

To the extent that this new style of coaching is aligned with broader schoolwide goals and is focused on what students need to know in the classroom, it has a stronger probability of success. More research is needed to determine how widespread and long-term the effects of coaching and mentoring are on teacher practice, and what effect these activities have on student achievement.

## **Technology**

Most people who access professional development material through some kind of technological means do so as individuals rather than as part of a larger school or district effort. Through e-mail and the Internet, for example, teachers can interact with their peers by subscribing to electronic mailing lists, bulletin boards, and chat rooms. They can also find information on curriculum and programs, download prepared lesson plans, and of course tap into an incredible wealth of content material. Individuals also get professional development credit hours for subscribing to online courses with professional development content—courses are offered in everything from cooperative learning to hands-on science strategies.

It is still relatively rare for planners to use technology to meet the needs of a group of teachers working together toward a professional development goal. Cost and lack of appropriate hardware still limit access to many types of technology. Although there is little research support yet for these emerging technologies, several have the potential to be effective means of influencing teacher practice if they are designed to take advantage of the characteristics mentioned above. Loucks-Horsley et al. (1998) describe how several could be used effectively.

- *Online courses* can be structured so that they meet the needs of groups within a school or district rather than individuals. If the group meets regularly to reflect on the content, and has ongoing access to the expertise of the course director, this can be a valuable resource.
- *Teleconferencing* is used to meet the needs of groups in rural or remote areas who would like access to high-quality presentations and information. Unfortunately, this is usually a one-time activity, and afterwards teachers do not have access to the presenter for follow-up.
- *Videotapes* are another useful means of conveying information, often as a prelude to a discussion. As mentioned above, case discussions are sometimes introduced with a video “case.”
- *CD-ROMs* provide groups of teachers access to a large amount of material. They have the advantage of being able to incorporate different types of material: print, videotaped footage, audio recordings, and others. They are both a good source of information and can be a springboard for discussion as well.

- *Networking programs* that offer computer-based support for meetings are designed to help groups through processes like building consensus, voting, and prioritizing. This emerging technology can be a useful tool to promote informed group decision making.

## Implications

The available research into the effectiveness of various types of professional development activities suggests that underlying characteristics are the most important factor in determining effectiveness, in particular whether an activity is content based and part of a coherent change strategy. To the extent that certain types of activities—case discussions, for example—appear effective, it is probably because they incorporate these characteristics. That explains why Garet et al. (2001) found that workshops that take place over a longer period of time, and are therefore more likely to be content based and coherent, are just as effective as “reform” types of activities.

For the professional development planner, this information is both helpful and challenging. Despite the fact that there is little empirical evidence to recommend one type of activity over another, the research indicates that any activity can be better designed to take full advantage of these underlying benefits. The professional development planner needs to ask the following questions: To what extent do different types of activities have these effective characteristics? To what extent can different activities be implemented in such a way that they take full advantage of these benefits?

One aspect of implementation for planners to consider is how a particular activity fits into an overall professional development plan. Because activities serve different purposes, they might logically be used at different stages of a professional development effort. According to Loucks-Horsley et al. (1998), strategies such as workshops, for example, are best used at the beginning of a change process because they help participants develop awareness of a new concept. Case discussions, on the other hand, might be designed to help teachers who have already implemented a new instructional strategy examine how it is working.

The table on the next page shows the extent to which nine common types of professional development activities have or *could* have the characteristics of effective professional development. Each row represents a different type of activity. Each column represents a characteristic shown by research to make professional development effective. A “Yes” in a cell means that the type of activity *inherently* has the characteristic in question. A “No” means that it inherently does not have the characteristic. A “By Design” in a cell indicates that the activity could have the characteristic if designed and implemented with that feature in mind.

What becomes clear in this table is that whether a particular type of professional development activity has merit depends largely on *design*. A wide variety of professional growth experiences can be effective if they are designed to incorporate research-based features and are aligned with the users’ context and goals.

## Effectiveness of Professional Development Experiences

	Focused on content students need to know	Aligned with broader goals	Long-term	Involves active learning	Collaborative effort within the school or district
Immersion	By Design	By Design	No	Yes	No
Involvement With Curriculum	Yes	Yes	By Design	By Design	Yes
Workshops Institutes/ Seminars	By Design	By Design	By Design	By Design	By Design
Action Research	By Design	By Design	Yes	Yes	By Design
Case Discussions	Yes	By Design	By Design	Yes	Yes
Study Groups	By Design	By Design	Yes	By Design	Yes
Examining Student Work	Yes	By Design	By Design	Yes	Yes
Coaching and Mentoring	By Design	By Design	Yes	Yes	Yes
Technology	By Design	By Design	By Design	By Design	By Design

## **About the Author**

Lucy Steiner is a consultant with Public Impact, an education policy and management consulting firm in Chapel Hill, North Carolina. She has worked extensively in the area of teacher professional development, developing content for the U.S. Department of Education's *Elevating Teaching to a Year-Round Profession* Web site, as well as conducting research on effective staff development for the NCREL<sup>®</sup> *Professional Development: Learning From the Best* toolkit. A former high school English teacher, Steiner holds a Master's in Education and Social Policy from Northwestern University.

## Research Criteria for This Review

There is little research that specifically measures the impact of different types of professional development activities. In order to draw some conclusions about what types of activities might have the best results, this review looked first at underlying characteristics of effective professional development and then at studies that measure the effect of specific professional development programs that use these strategies. In the latter case, researchers were not attempting to isolate activity type from other variables associated with the program, and so the conclusions are tentative.

In order to determine how much “weight” to assign a given finding, the review asked the following questions:

### *1. What is the study designed to measure?*

Most research designed to measure the impact of professional development examines whether professional development influences teachers. One level of impact is teacher attitudes: Are teachers more positive about using a specific instructional strategy because they participated in a professional development activity? Other studies measure a higher level of impact: Do teachers’ behaviors and practices in the classroom change as a result of their participation? In both cases, teacher surveys are frequently used to determine the level of impact. Occasionally, researchers provide independent verification of changes by observing classes and examining teacher materials.

In addition to these studies of teacher change, a small but growing number of studies hold professional development to an even higher standard by asking how it impacts student learning. Unfortunately, this is a difficult task. Schools, particularly those that are in the midst of a reform effort, are complex environments. It is difficult to isolate the effect professional development has on student achievement relative to other simultaneous influences. A few of the studies included in this review do meet this standard.

### *2. How was the study designed?*

**Experimental studies** are desirable because they allow the researcher to control for extraneous variables that might affect the outcome. But since they require random assignment to either a control or a treatment group, this method is rarely employed in professional development research. In a few of the studies included in this review, teachers are randomly assigned to either a control or treatment group; therefore, they do meet the criteria for an experimental study. In all cases, experimental studies are noted in the text with a description of how teachers are randomly assigned.

**Quasi-experimental studies** do not use random assignment, but they still provide researchers some way of comparing a group that received the treatment with a group that did not. The most rigorous type of quasi-experimental study has a pretest and posttest with a well-matched control group, but not all quasi-experimental studies have either a pretest or a matched control group. The more rigorous the study, the more it allows the researcher to measure growth and reduces the chances that the change is a result of other

factors. It also increases the generalizability of the results. There are a few quasi-experimental studies included in this review.

**Descriptive studies** do not allow researchers to draw conclusions about the effects of a treatment. Case studies, for example, describe and seek to explain events at a particular site. Because so little research is available, the majority of the studies in this review are descriptive. One important role that this kind of research plays is to point the way for further research. It is hoped that these case studies, which do present a compelling case for the link between professional development and student achievement, will help researchers design studies that measure what aspects of professional development have the most impact on teacher practice and student learning.

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