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Providing Performance Feedback to Teachers: A Review

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Abstract: *Teacher preparation programs are under scrutiny for their role in the troubled American educational system. Thus, teacher educators must encourage teachers to use effective teaching practices. One technique for increasing use of effective practices is providing feedback to teachers on both newly acquired and ingrained teaching behaviors. To determine attributes of effective performance feedback, a systematic search for empirical literature was completed. Analysis of the ten identified studies indicates attributes of feedback that have been studied fall into categories of (a) nature of feedback, (b) temporal dimensions of feedback, and (c) who gives feedback. Through this review, attributes of feedback were classified as either promising or effective practice in changing specific teaching behaviors. Only immediate feedback was identified as an effective attribute. Promising practices for feedback to teachers included feedback that was specific, positive, and/or corrective. These findings, recommendations and directions for additional research in feedback and teacher preparation are discussed.*

Many individuals have expressed concern regarding teacher effectiveness. These concerns have implications for teacher preparation at both preservice and inservice levels (Greenwood & Maheady, 1997; Lavely, Berger, & Fulmar, 1992; Lindsey & Strawderman, 1995; Maheady, Mallette, & Harper, 1996). Of particular interest to those involved in teacher preparation, is that children are failing in school at least in part because some teachers are inadequately prepared to teach (Greenwood & Maheady, 1997). Indeed, almost all preservice teachers who complete the necessary coursework make it through student teaching and become certified teachers, regardless of their ability. Failing grades in student teaching are unheard of in most universities. In fact, 80% of schools and colleges of education fail 1% or fewer of their student teachers, including 15% that never fail any (Sudzina & Knowles, 1993). Additionally, of graduates who go on to teach, 10% are considered incompetent (Lavely et al., 1992). Because almost all preservice teachers eventually become inservice teachers, regardless of ability, teacher educators must identify and encourage teachers to use effective teaching practices early and consistently.

An extensive research base in effective instructional practices exists (e.g., Albers & Greer, 1991; Brophy & Good, 1986; Carnine, Silbert, & Kameenui, 1997; Christenson, Ysseldyke, & Thurlow, 1989; Deshler, Ellis, & Lenz, 1996; Ellis, Worthington, & Larkin, 1994; Englert, 1983; Gersten, 1998; Prater, 1993; Rosenshine & Stevens, 1986; Stein, Carnine, & Dixon, 1998; Ysseldyke, Algozzine, & Thurlow, 2000). Preservice teachers may or may not learn about effective curriculum, methods, materials, and strategies in college classes. However, even if preservice teachers learn effective practices in college classes, the practices may not always make it into actual classrooms with children. Lack of transfer of research-based methods into classroom practice may result from a teacher's benign neglect, carelessness, lack of

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preparation, or resistance to change (Gersten, Morvant, & Brengleman, 1995).

Regardless of the reason, erratic implementation of effective practices is exacerbated if supervisors fail to provide sustained professional development and technical feedback (Gersten, Vaughn, Deshler, & Schiller, 1997). Teachers who attempt to try new teaching methods must receive regular feedback about the impact of new practices on student learning. This may be accomplished through feedback provided by supervisors. In order to provide effective feedback to teachers, supervisors and others involved in teacher preparation must first know the attributes of effective feedback. However, feedback may take many forms, may be delivered in many ways at different parts of the learning process, and by different individuals. The nature of the behavior that is the focus of the feedback may also impact feedback effectiveness.

Van Houten (1980) organized attributes of feedback into three categories: (a) the nature of the feedback, (b) the temporal dimensions of feedback (frequency and whether it is delayed or immediate), and (c) who delivers the feedback (peers or supervisors). Within these categories, feedback can be studied on numerous dimensions or attributes.

Nature of feedback includes feedback content (e.g., what is delivered), and the means or medium through which it is delivered. Feedback content includes such attributes as whether it is corrective or noncorrective, general, positive, or specific. Functionally, some content attributes may be used in combination with others, so it is important to identify what is already known to be effective and look for ways to become even more so. For example, it is well established that for complex forms of human action, feedback needs to be specific instead of general (Eisner, 1992). Furthermore, corrective feedback (i.e., feedback that identifies the type and extent of errors, and provides specific ways to correct them) is purported to be one of the most useful tools for eradicating perseverative or well-learned errors because it demonstrates correct responses (Van Houten, 1980). Nature of feedback also accounts for how it is delivered, such as live, audio, or video, or through checklists or anecdotal reports. If one medium is more effective than another, it should be identified and used in teacher supervision.

It is also important to study temporal dimensions of feedback, which include two aspects, frequency and timing. In the school-aged population, the more frequently feedback is provided, the more learning takes place (Van Houten, 1980). Because teachers are influenced by the same behavioral principles as the students they teach, frequency of feedback by supervisors to teachers should be studied to determine how to apply this principle in teacher training. Timing of feedback is either immediate or delayed. Immediate feedback prevents teachers from practicing errors that might otherwise go uncorrected with more delayed feedback. Feedback, whether immediate or delayed, may take the form of positive reinforcement (i.e., praise) as well as error correction. If reinforcement is not immediate, it is possible that an intervening behavior will be reinforced instead. Thus, just as timing and frequency are critical dimensions of reinforcement, they are also important in attempts to change a teacher's behavior through feedback.

The role of the person delivering feedback is the final dimension. Feedback may be delivered to teachers by university supervisors, on-site supervisors or peer coaches. The traditional person delivering feedback to preservice teachers in field placements is the university supervisor. However, the effectiveness of supervision by university supervisors may be compromised by such factors as scheduling and time constraints, large numbers of students to observe, and unclear field experience objectives (Buck, Morsink, Griffin, Hines, & Link, 1992; Englert & Sugai, 1983; Lignugaris/Kraft & Marchand-Martella, 1993). Similar concerns may confront on-site school district supervisors, thus, peer coaching has become an increasingly appealing alternative to traditional supervision at both preservice and inservice levels.

Peer coaching has been described as a process in which teams of teachers regularly observe each other and provide support, feedback and assistance in order to help improve or refine instructional practice (Mallette, Maheady, & Harper, 1999). One reason it is

purported to be successful is that power differentials are minimized. When evaluation is eliminated as a purpose of supervision, as is done in some peer coaching models, it is possible to have a learning environment that is unlikely in more traditional supervisor systems (Showers, 1985). Comparing the impact of feedback as a function of the role of the person providing the feedback may produce some practical implications for providing more frequent and effective feedback.

Persons concerned with providing feedback to teachers would benefit from having some guidance supported by empirical findings as to which attributes of feedback are effective. However, using a single study to support any one attribute is insufficient for adopting an attribute on any large scale. Chambless and Hollon (1998) suggested that when at least three well-designed studies with positive findings on any one intervention are evident in the literature, individuals may go forward with the assumption that they will be implementing an effective intervention. When there are fewer than three well-designed studies to support a practice, that practice should be considered as merely promising but worthy of further scrutiny.

Given concerns about the effectiveness of teachers and the potential usefulness of feedback to improving teacher effectiveness, this paper was designed to provide a comprehensive review on the attributes of feedback to teachers, (nature, temporal, and who delivers it) to determine which attributes contribute to its effectiveness and which are merely promising practice. Van Houten's (1980) organizational framework serves as the basis for analysis.

Method

Selection Criteria

In order to define the body of knowledge that was to form the basis for the review and would allow application of the Chambless and Hollon (1998) guidelines, only experimental or quasi-experimental studies published in refereed journals or *Dissertation Abstracts* between 1970 and the present were reviewed. All included studies were directed at examining the impact of one or more dimensions of feedback on the teaching behaviors of inservice or preservice teachers.

Search Procedures

ERIC (Education Resources Information Center), Psych Info and *Dissertation Abstracts* searches were conducted covering the years 1970 to the present. Descriptors used individually and in various combinations included adult learning and characteristics, student teaching, student teachers, systematic observation, feedback, direct observation, preservice teacher education, peer coaching, corrective feedback, cueing, prompting, delayed feedback, self-correction, error correction, bug-in-ear, and teacher supervision. An ancestral search using reference lists from articles obtained via the data-base searches produced additional sources. These procedures yielded 77 articles on feedback to teachers. However, careful examination reduced the final pool to 10 studies. The criterion upon which most of the 67 studies were excluded was either that the independent variable was not a dimension of feedback or a true experimental or quasi-experimental design was not used. Thus, excluded sources were either off-topic or poorly designed.

Results and Discussion

Although the empirical literature base is small, researchers used a wide variety of designs, variables and conditions. Table 1 provides an overall analysis of the research reviewed.

Participants and Settings

Researchers largely targeted preservice teachers in that of the 208 teachers who participated in the 10 studies, 199 were preservice and only 9 were inservice. Four studies were conducted in special education classrooms and six in general education classrooms. Experience of inservice teachers ranged from 1 to 20 years. Preservice teachers were in their junior or senior years of college. Henceforth, the term "teacher" is used to refer to all study participants regardless of their status as preservice or inservice.

Table 1. Attributes of Feedback with Preservice and Inservice Teachers Feedback

Author	Participants	Design	Independent Variables: Nature	Independent Variables: Temporal dimensions	Independent Variables: Who	Target behavior of feedback	Result
Cossairt, Hall, & Hopkins (1973)	3T	Multiple baseline across participants	NC NC/P PKG			T praise; S attending behavior	Y; PKG & NC/P increased T praise
Englert & Sugai (1983)	20 PT	Mixed – 2 group × 2 trial analysis	SC AR			di teaching behaviors	Y; SC better than AR
Hindman & Polsgrove (1988)	27 PT	Mixed – 2 group × 2 trial	SF AR			Duration of time by Tin instructional activities	Y; Inconclusive
Hao (1991)	92 PT	Mixed – 3 group × 2 trial	C NC G			Decrease frequency of PTs "Okay," increase variety of reinforcement	C better than NC & G
O'Reilly, Renzaglia, Hutchins, Koterba-Buss, Clayton, Halle, & Izen (1992)	3 PT	Adapted within - subject alternating treatments design		I & D		Appropriate use of positive consequences and prompting	I more effective for 2 PT, D more effective for 1 PT
Giebelhaus (1994)	22 PT	Mixed – 2 group × 30 observations	AC SC			Discrete teacher clarity behaviors: state objective, highlight important points, repeat, use visuals, summarize, model, explain, pause, ask questions, give wait time, practice, check	Inconclusive
O'Reilly, Renzaglia, & Lee (1994)	2 PT	Adapted within - subject alternating treatments design		I & D		Approriate use of positive consequences and prompting	I more effective than D for 2 PT
Pierce & Miller (1994)	29 PT	Mixed – 2 treatment × 2 trial			PS & SU	Increased use of effective tchg behaviors (classroom mngmt, use of praise, enthusiasm, data collection, pacing, momentum) and decreased use of ineffective tchg behaviors (delays, disorganization, use of general praise, loss of momentum, lack of evaluation methods, no lesson structure)	No difference between PS and SU
Coulter & Grossen (1997)	6T	Adapted alternating treatment design		I & D		Error correction, point awarding, student progress monitoring	Y; Faster acquisition of target behaviors with I

Table 1. *Continued.*

Author	Participants	Design	Independent Variables: Temporal dimensions: Nature	Independent Variables: Temporal dimensions: Who	Target behavior of feedback	Result
Sharpe, Lounsbery, & Bahls (1997)	4 PT	Multiple baseline across participants	SC G		S activity engagement, time spent in organizational and off task behavior; PT response to OAA incidents	Y; Increased S activity engagement, time spent in organizational and off task behavior decreased with SC; response by PT to OAA increased

CODE: Participant: T = inservice teachers, PT = preservice teachers; Nature (Content): C = corrective, NC = noncorrective, G = general, P = positive, SF = specific feedback, PKG = NC, P, (+prompt) (Medium), AC = audio cueing, SC = specific checklist, AR = anecdotal report; Temporal Dimensions: I = immediate, D = delayed; Target Behavior: di = direct instruction teaching behaviors, OAA = occasions for appropriate actions; Results: Y = student behavior reported

Dependent Variables: Target Behaviors of Feedback

Behaviors targeted for change through feedback included both those to be increased and those to be decreased. Teacher behaviors targeted for increase included use of praise, specific direct instruction teaching behaviors, effective use of time, and/or responding to behavioral incidents. Teaching behaviors targeted for reduction included decreasing the frequency of "okay" and use of specific ineffective teaching behaviors (such as incorrect signaling in a direct instruction lesson). Along with decreasing behaviors, alternative behaviors were targeted to be increased, such as using a variety of reinforcement and specific direct instruction behaviors (e.g., correct use of signals). Researchers in six studies had dependent variables focused on at least one specific direct instruction behavior (e.g., prompting or using signals). The target behavior in each study included at least one discrete behavior although the number of discrete behaviors varied across studies, from 1 (e.g., frequency of saying "Okay") to 14 (e.g., specific direct instruction teaching behaviors).

Independent Variable: Nature of Feedback

Nature of feedback includes both the content and the medium of the feedback message. Analysis of the results of the six studies in which content and medium were employed as independent variables is presented in the following two subsections. A discussion follows analysis of the results.

Feedback Content: Results

Feedback content (what is communicated) can be organized into five nonexclusive categories: (a) corrective feedback—the type and extent of error and specific ways to correct the error are suggested; (b) noncorrective feedback—the type and extent of error to the learner are identified; (c) general feedback—vague and nonspecific, but evaluative feedback is uttered (e.g., "Okay"); (d) positive feedback—praise contingent on demonstration of a specific teaching behavior is provided; and (e) specific feedback—objective in-

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formation related to predetermined specific teaching behaviors is offered. Feedback content was the treatment variable in five studies.

In one of the earliest studies on feedback, Cossairt, Hall, & Hopkins (1973) compared two types of feedback and instructions, (an antecedent manipulation or prompt). Feedback conditions included (a) noncorrective feedback, consisting of information on the number of times the teacher performed specific teaching behaviors; (b) noncorrective plus positive feedback, consisting of social praise for performing specific teaching behaviors plus a verbal report of the number of times the teacher performed these behaviors; and (c) a package condition, consisting of simultaneous introduction of instructions (a prompt) and noncorrective with positive feedback. Teachers' praise of students, and students' attending behavior were the dependent measures. Coissart et al indicated that noncorrective feedback did not produce conclusive increases in teacher praise but positive feedback paired with noncorrective feedback resulted in significant increases of teacher praise. Use of the package condition also increased teacher praise. However, no changes occurred on students' attending behavior.

Hindman and Polsgrove (1988) compared general feedback (i.e., anecdotal field notes, described in the study as observer comments regarding the lesson, involving a one-page anecdotal record of observed teaching behaviors and observer feedback on overall lesson effectiveness with suggestions for improvement) with specific feedback (computer generated objective feedback directly related to specific training on academic learning time teaching behaviors), with two groups of teachers. Following baseline, each group participated in a differential training session. Group A received training in the concept of academic learning time and related teaching behaviors, while Group B received training in humanistic classroom management procedures. Following training, Group A teachers received computer generated objective feedback directly related to academic learning time teaching behaviors. They also received general feedback (field notes). Group B received only general feedback. There were statistically significant differences between Groups A and B with Group A teachers using more effective instructional strategies. When Group B teachers received the same training in academic learning time, they also demonstrated a substantial increase in their use of more effective instructional behaviors. It is important to note here that even though baseline data were taken on specific academic learning time teaching behaviors, at no time was general feedback compared to specific feedback on these behaviors without the intensive instrucion on academic learning time that accompanied the specific feedback treatment variable. With instruction on the dependent variable occurring with only one treatment (specific feedback) and not the other (general feedback), it cannot be established that the nature of feedback, in this case, specific feedback, and not instruction was the reason for the change in teaching behaviors.

Englert and Sugai (1983) and Sharpe, Lounsbery, and Bahls (1997) also compared specific feedback with general feedback. Englert and Sugai used a peer observation framework for both experimental and control groups. Differences in treatment of the two groups were the nature of the written observation instruments (i.e., specific versus general) and the type of data each system provided for the teacher. Englert and Sugai required peer observers in the control group (i.e., general feedback) to develop their own data collection and information-sharing procedures for the purpose of providing feedback. Peer observers in the experimental group (specific feedback) were given detailed data collection forms constructed around explicit instructional practices. Rapid improvement in specific teaching skills occurred when detailed forms containing specific feedback were implemented.

Sharpe et al. (1997)described general feedback as qualitative feedback related to teaching performance based on a 15-item Likert scale. The experimental (i.e., specific feedback) condition consisted of using a written sequential behavioral feedback protocol to measure occasions for appropriate actions (OAA), which were opportunities for the teacher to respond to a student's instructional (difficulty with learning a skill) or managerial (student's off task) behavior. Feedback was

delivered once per week and consisted of 15 minutes of supervisor and teacher discussion of the written OAA data describing the sequential teacher/student behavior for that day's teaching performance. Setting 1 to 3 goals corresponding to the most severe OAA problems encountered within the lesson followed the feedback session. Student on-task time and teacher responses to OAA increased with use of the specific feedback protocol.

Hao (1991) compared effects of corrective, general, and noncorrective feedback among three groups of preservice teachers. Teachers were videotaped as they taught lessons and then provided feedback as they viewed the videotapes with teaching assistants. One group of teachers received corrective feedback, which consisted of informing the participants of verbal behavior, for example, frequency of "okay" and variety of verbal positive reinforcers, plus verbal instruction in corrective strategies and a written handout describing alternatives to the undesirable verbal behavior. A second group received noncorrective feedback, consisting of informational feedback containing only information on how a teacher did on a certain task, and a third group received only general feedback, consisting of a single positive but general word or phrase such as "good" or "right." Corrective feedback was found to be significantly better than both noncorrective and general feedback in increasing teacher use of a variety of verbal positive reinforcement phrases.

Feedback Medium: Results

Feedback medium, the means of transmitting feedback content, was the treatment in but a single study. Two studies of feedback medium were originally identified for analysis but careful examination indicated only Giebelhaus (1994) compared use of technology to deliver feedback with another type of feedback, whereas DeWulf, Biery, and Stowitschek (1987) compared use of technology to deliver feedback with no feedback at all. Thus, Dewulf, et al. did not examine different forms of feedback media.

Giebelhaus used a piece of technology, a wireless one-way communication device referred to as bug-in-the-ear (BIE), to communicate with preservice teachers by delivering specific prompts on 14 discrete behaviors when the teacher engaged in undesirable behavior during the lesson. One group of student teachers received feedback with the BIE ; the control group did not. Unfortunately, Giebelhaus did not describe how the control group in this study received feedback. More importantly, of the 14 discrete skills targeted for change, only one, asking questions, demonstrated a statistically significant improvement. There were no significant differences between posttest measures and delayed follow-up measures between experimental and control groups but with no information on the control group, it is difficult to draw conclusions from the study.

Nature of Feedback: Discussion

No definite statements can be made about the effectiveness of variations of either feedback content or feedback medium because neither meets the criterion of three well-designed studies. Promising practices, those attributes of feedback with at least one well-designed study to support them, included positive feedback (Cossairt et al., 1973), specific feedback (Englert & Sugai, 1983; Sharpe et al., 1997), and corrective feedback (Hao, 1991). The only study on medium of feedback included in this review was designed in a manner in which definite statements as to the effectiveness of feedback content or medium cannot be made without a better designed and described methodology.

The results of the studies on the content of feedback are consistent with other learning research. That is feedback that is positive, specific and corrective results in positive changes in teacher behavior. More explicitly, specific feedback resulted in an increase in the amount of time teachers spent on targeted direct instruction teaching behaviors. Corrective and positive feedback increased usage of a variety of positive reinforcers, more questions asked of students by teachers to check understanding, more verbal interactions with students, more effective use of pacing and prompting behaviors, and a decrease in the usage of "okay.". This should be useful information to school administrators who can use corrective feedback as a

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promising practice to accomplish the goal of improving instruction with experienced inservice teachers who have been "practicing" errors.

Independent Variable: Temporal Dimensions of the Feedback

Temporal dimensions involve timing and frequency of feedback. Of the ten studies reviewed here, timing of feedback was the intervention in three. Feedback frequency was not a studied variable in any of the reviewed literature.

Timing of Feedback: Results

Immediate supervisor verbal feedback during the lesson was compared with delayed feedback in three studies (Coulter & Grossen, 1997; O'Reilly et al., 1992; O'Reilly, Renzaglia, & Lee, 1994). Appropriate use of prompts and positive consequences were the dependent measures in O'Reilly et al. (1994), and O'Reilly et al. (1992). In the Coulter and Grossen (1997) study, error correction procedures (by a student teacher with school-aged students) and point awarding were the dependent measures.

The immediate feedback procedure was similar in all three studies. Each time the teacher incorrectly performed the target behavior, the supervisor would interrupt instruction, identify the error, and ask the teacher how he/she could correct the error. If necessary, the supervisor would describe the appropriate procedure while modeling the correct behavior. Supervisors used prompting and directives more frequently than modeling procedures in the later treatment sessions.

Delayed feedback occurred 1 to 3 days following the observation in the studies by O'Reilly et al. (1994), and O'Reilly et al. (1992), and either immediately after the teaching session or later the same day in the study by Coulter and Grossen (1997). Immediate feedback resulted in faster acquisition of effective teaching behaviors and acquisition at a higher level than delayed feedback in all three studies. Maintenance of behavior acquisition was apparent in O'Reilly et al. (1994) after five weeks, and after two weeks in Coulter and Grossen.

Timing of Feedback: Discussion

Researchers used effective research designs and procedures in all three studies of feedback timing. Because they were well-designed and results were unequivocal, the case that immediacy is an effective attribute of feedback is a strong one. Targeted teaching behaviors were acquired faster and more efficiently when feedback was immediate. Supervisors were able to teach more in less time (efficiency of learning), and they were able to model effective instruction techniques. However, immediate feedback does require the supervisor to change from unobtrusive observation to active involvement in the lesson (O'Reilly et al., 1994). Such supervision may not be appropriate for all settings and teachers because the interruptions may reduce instructional momentum (O'Reilly et al., 1994). However, it may be that even with disruptions to momentum, the value of immediate feedback is worth the cost, especially in the long run. Such disruptions may be necessary only during initial stages of acquisition of effective teaching behavior. Certainly some disruption to momentum is preferred to continued practice of ineffective teaching.

Independent Variable: Who Delivers the Feedback

The final variable of interest is the role of the originator of the feedback. There are several ways to categorize the flow of feedback such as (a) university supervisor to preservice teachers (expert/novice), (b) peer coaches with peers (novice/novice), and (c) experienced inservice coaches with less-experienced peers (experienced/novice). Given the widespread use of peer coaching, researchers and practitioners might expect that it has been thoroughly researched and systematically compared to traditional supervision. Disappointingly, the search conducted for this review produced only six studies initially; only one study (Pierce & Miller, 1994) met all four criteria for this review of the attributes of effective feedback. The remaining did not meet the criterion for experimental or quasi-experimental design.

Who Delivers Feedback: Results

Peer coaching has been described as a process in which teams of teachers regularly observe each other and provide support, feedback and assistance in order to help improve or refine instructional practice (Mallette et al., 1999). Pierce and Miller (1994) compared peer coaching procedures (novice/novice) with traditional faculty supervision (expert/novice). Behaviors targeted for feedback were discrete teaching behaviors. Both conditions were conducted in a practicum setting and involved observations with feedback consisting of event recording using a modified version of a state teacher competency assessment system. Results indicated that teachers increased effective teaching behaviors while decreasing ineffective teaching behaviors under both conditions. Thus peer coaching was not superior to traditional supervision.

Who Delivers Feedback: Discussion

It appears that peer coaching has been oversold on the basis of a woefully inadequate research base. Of 77 studies originally identified for this review, peer coaching was identified by researchers as the independent variable in six (Kohler, Crilley, Schearer, & Good, 1997; Lignugaris/Kraft & Marchand-Martella, 1993; Mallette et al., 1999; Morgan, Gustafson, Hudson, & Salzberg, 1992; Morgan, Menlove, Salzberg, & Hudson, 1994; Pierce & Miller, 1994). However, only Pierce & Miller (1994) was a true comparison of feedback delivered by peer coaches with delivery of feedback by others (such as supervisors). Yet, researchers claimed that peer coaching is effective in changing teachers' behaviors. In actuality, researchers compared the effects of peer feedback with no feedback at all. If it is known that feedback is effective in changing behavior, it can be assumed that when the feedback is introduced in the treatment phase of a study, after providing no feedback at all in baseline, a change in behavior should occur. It is not the presence of the peer that occasions change, it is the introduction of feedback. The only study in which the two were compared (peer coaching with university supervision) resulted in no differences in the effectiveness of the feedback. With only one well-designed study on who delivers feedback to teachers in the literature, no definite statement can be made about the relative effectiveness of peers or traditional supervisors. Likewise, results indicate that it cannot be considered as promising practice.

Furthermore peer coaching evinces some significant disadvantages: (a) extensive training of peer coaches and associated costs, and possible negative effects of coaching on the coaches themselves (Morgan et al., 1992); (b) maintaining consistency when peers are responsible for grading (Lignugaris/Kraft & Marchand-Martella, 1993); and (c) difficulty providing feedback on instructional procedures that peer coaches are just learning themselves (Mallette et al., 1999).

Conclusions and Recommendations

Ten empirical studies on the impact of various attributes of feedback to teachers, inservice as well as preservice, were reviewed and analyzed within the following categories: (a) nature of feedback, (b) temporal dimensions of feedback, and (c) who delivers feedback. The only attribute that clearly demonstrates efficacy as a characteristic of effective feedback is immediacy. Thus, it seems obvious that supervisors should seek ways to provide feedback as close to the occurrence of teaching behavior as possible. Immediate feedback, however, as delivered in these few identified studies raises concerns about interruption of the flow of instruction and the potential adverse impact on the students in the room. However, although potential adverse effects have been identified, they have not been established, nor has it been determined that any effects are harmful or long-lasting. Thus, supervisors should not delay feedback for fear of an unsubstantiated and perhaps ephemeral effect. Conversely supervisors should investigate ways to provide immediate feedback in the least intrusive manner. Application of electronic technology such as the bug-in-ear device may prove useful. In addition, the literature does not reveal when feedback delay results in behavioral decay. If immediate feedback is intrusive and disrupts the learning process, perhaps feedback that occurs within the same half-day is

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almost as effective and can be accomplished without the disruption. In either case, the target for feedback timing should be as close to the instructional event as possible.

Use of specific, corrective and/or positive feedback is promising as a supervisory practice. Although there is only one study to clearly support this attribute, there is ample support in the broader literature on learning (see for example, Alberto and Troutman, 1999, pp 246–247; Woolfolk, 1993, p. 559). Thus, while additional research verification is appropriate and necessary, supervisors should provide feedback that is positive, focused on specific teaching behaviors and provides clear and concise directions for desired behavior change especially in light of the fact that the literature reveals that general, noncorrective, and delayed feedback is ineffective.

The literature also reveals that a broad array of desirable teacher behaviors are amenable to change through feedback including increasing use of praise, direct instruction teaching behaviors, effective use of time, and responding to incidents. Feedback is also clearly effective in reducing undesirable behaviors such as habitual use of "okay."

Despite the obvious limitations, the literature clearly supports three general conclusions that should be adopted into practice: (a) feedback is better than no feedback, (b) immediate feedback is better than delayed feedback, and (c) feedback that is immediate, specific, positive and corrective holds the most promise for bringing about lasting change in teaching behavior.

Given that feedback to teachers is critical, further research should be conducted to extend application of effective feedback techniques to more settings, with more teachers, under different conditions. For example, there is no literature on the requisite frequency of feedback. How often should observation and feedback occur at different stages of teacher development? The literature clearly states that many student teachers do not feel they are supervised enough or receive enough feedback (Buck et al., 1992). Furthermore, once in the classroom, beginning teachers are reluctant to give up practices that helped them survive their first year of teaching (Griffin & Kilgore, 1995). Acquisition and implementation of teaching practices early in a teacher's development have long-term career effects. Therefore, logic dictates that observation and feedback are especially critical during the preinduction and induction phases of teacher development and feedback should occur with high frequency and immediacy during that period. Prevention of undesirable teaching behavior through careful and frequent early supervision is much more efficient than later remediation.

Although the literature is small and limited, it is consistent with what is known about human learning in general. Teachers, as other learners, acquire and maintain new behaviors best when they receive systematic instruction, have multiple opportunities to practice and receive feedback that is immediate, positive, corrective and specific. If professionals in the field of teacher preparation wish to improve the effectiveness of teachers, they should seek to develop ways to implement the identified attributes in efficient and consistent ways. This begins with development of efficiencies and multiple opportunities for practice and feedback during student-teaching experiences. Research on promising practices in the delivery of feedback that is not disruptive to the learning process is critical.

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