DOCUMENT RESUME

ED 293 268 EC 202 467

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TITLE Teacher Effectiveness and Teacher Decision Making: Implications for Effective Instruction of Handicapped Students. Monograph No. 5. Instructional Alternatives Project.
INSTITUTION Minnesota Univ., Minneapolis.
SPONS AGENCY Office of Special Education and Rehabilitative Services (ED), Washington, DC.
PUB DATE May 87
GRANT G008430054
NOTE 47p.; For related documents, see EC 202 465-468.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Decision Making; *Disabilities; Educational Practices; Elementary Secondary Education; Information Utilization; Models; Research Methodology; Role Perception; Self Concept; *Teacher Characteristics; *Teacher Effectiveness; Teacher Role; Theories

ABSTRACT

The monograph summarizes findings from two research areas: teacher effectiveness and teacher decision making practices. Paradigms for research on teaching, characteristics of an effective teacher, generalizations about teachers' decision making, decision making models, and the relationship of teacher self-efficacy and teacher behaviors are reviewed. Implications for handicapped students include the importance of instructional consultation and meeting individual students' and groups of students' instructional needs. Research paradigms include: process-product paradigm, mediating-process paradigm, classroom ecology paradigm. Effective teacher characteristics are outlined for such areas as classroom management, instructional organization, lesson presentation, teacher beliefs, and teacher practices. Generalizations from the research on teacher decision making are discussed in six categories: the kind of information used, focus of instructional planning, use of curriculum objectives, judging the lesson implementation, use of time, and accuracy in judging student performance. Four decision-making models are considered which focus on: (1) teacher decision making, (2) supervision, (3) teacher education, and (4) instructional improvement. Finally, the research on teachers' beliefs concerning self-efficacy and their effects on teacher effectiveness is discussed. Sixty-two references are appended. (Author/DB)

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MONOGRAPH NO. 5

TEACHER EFFECTIVENESS AND TEACHER DECISION MAKING: IMPLICATIONS FOR EFFECTIVE INSTRUCTION OF HANDICAPPED STUDENTS

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INSTRUCTIONAL ALTERNATIVES PROJECT

May, 1987

Abstract

This monograph is a summary of findings from two research areas: teacher effectiveness and teacher decision-making practices. Paradigms for research on teaching, characteristics of an effective teacher, generalizations about teachers' decision making, decision-making models, and the relationship of teacher self-efficacy and teacher behaviors are reviewed. Implications for handicapped students include the importance of instructional consultation and meeting individual students' and groups of students' instructional needs.

This project was supported by Grant No. G008430054 from the U.S. Department of Education, Office of Special Education and Rehabilitative Services (OSERS). Points of view or opinions do not necessarily represent official position of OSERS.

Teacher Effectiveness and Teacher Decision Making: Implications for Effective Instruction of Handicapped Students

The Instructional Alternatives Project is a series of investigations aimed at assessing the effectiveness of alternative methodologies for increasing academic engaged time and academic outcomes for mildly handicapped students. The purpose of this monograph is to summarize what literature reviews and selected studies in the areas of teacher effectiveness and teacher decision making have to say, or suggest, about effective instruction for handicapped students. The[illegible]as are just two of many that pr[illegible]ide a basis for characterizing t[illegible]itative nature of instruction for handicapped students.

For the past decade, educational psychologists have paid considerable attention to the relationship between time and school learning. Building on the seminal work of Carroll (1963) and subsequent work by Bloom (1974), Harnischfeger and Wiley (1976) and Wiley and Harnischfeger (1974), researchers have conducted major investigations of the relationship between opportunity to learn (variously called academic engaged time, academic learning time, academic responding time, or time on task) and instructional outcomes. Now, in the past few years, the need to go beyond quantitative measures of engaged time to investigate what students do during engaged time (i.e., the qualitative nature of instruction), increasingly is recognized. Ours is one such effort.

Several comprehensive reviews of time research findings and issues have been written (Anderson, 1984; Graden, Thurlow, & Ysseldyke, 1982; Karweit, 1983). In general, researchers have demonstrated: (a) school and teacher differences in time allocated to instruction exist; when aggregated over the school year, large differences between schools and classrooms in opportunity to learn in various curriculum areas result; (b) students spend a relatively small

percentage of the school day actively engaged in academics; (c) the percentage of time engaged varies considerably across classrooms and across individual students within classrooms, resulting in large differences between students in time actively involved in learning; (d) engaged time rates depend on a variety of organizational factors (classroom management, class size, interruptions), content area, and the point in time during the instructional period; and (e) engaged time is consistently though moderately related to student achievement. In addition to the tremendous variation in use of classroom time, additional time used to make up for ineffective instruction is negatively correlated with achievement (Frederick & Walberg, 1980; Karweit, 1983).

Time-based research is criticized on several counts. First, it is said that attention is drawn away from the quality of learning and to the quantity of time spent learning. Confrey (1981) argues that what occurs during a time period, not simply accumulation of time, is most critical for student learning. Thus, assignment of "busywork" can result in high time-on-task rates for students without concomitant increases in learning. Karweit (1983) criticizes time research because: (1) time appears to be at most a moderate predictor of achievement, (2) teacher, student, and classroom variation in engaged time may not be as easily altered as suggested by Bloom (1980), and (3) large increases in instructional time may be required for reasonably small changes in achievement. In her review and re-analysis of studies of engaged time and achievement, she concluded that there is a consistent, but low, positive correlation ($r = .09$ to $.43$) between the two when initial ability is controlled. Thus, time and other variables share substantial common variance.

In general, time-based studies of school learning result in the overall conclusion that time is one factor, but not the sole factor, in producing

student achievement. Simply stated, increased time is a necessary but not a sufficient condition for improving student achievement. Several researchers echo the need to investigate other aspects of the qualitative nature of instruction. Consider the following:

> The value of future classroom research will improve if more attention is placed upon the quality of instruction and if research becomes more integrative, examining the teacher, students, and particular curriculum tasks in specific contexts. (Good, 1983, p. 129).

> Clearly it is the quality more than the quantity of schooling which best serves as an educational and research focus. Quality of schooling includes not only time on task, but time well spent. It also includes, however, time spent on teaching practices such as encouragement, corrective feedback with guidance, small group discussions, individualization, and students involvement in their own education; but not idle praise, corrective feedback without guidance, rambling verbal interactions, busywork as a controlled device, or token student making. (Sirotnik, 1983, p. 26)

> We need to move beyond the now well established relation between time on task/student engagement/teacher management skills and student learning...at this point we no longer need to replicate these findings; instead we need to go beyond them in order to observe other relations. (Brophy, 1979, p. 749)

Teacher decision making and teacher effectiveness are important aspects of the qualitative nature of instruction.

The qualitative nature of instruction has not received the attention for handicapped students that it has for nonhandicapped students. Since a primary goal of the Instructional Alternatives Project is to document the qualitative nature of instruction for handicapped students, a necessary first step was to review the relevant literature, literature that might directly address the issues related to instruction for handicapped students, or that at least would provide insights that might be relevant to students in the special education population.

In this endeavor, seven general areas of literature were identified. They are as follows:

Teacher Effectiveness
Teacher Decision Making
Student Cognitions
Instructional Psychology
Models of School Learning
Effective Schools
Effective Instruction

The first two areas are summarized in this monograph. Other areas are summarized in other monographs. In each literature review, we identified those factors that individuals say are important or that research has documented empirically to be related to positive academic outcomes. Based upon these literature reviews, over 100 factors were generated. These factors, organized into environmental, instructional, and student characteristics, were studied and the decision was made to focus on an analysis and description of instructional factors for assessing the qualitative nature of instruction. The procedure used to develop a scale for this purpose is described in Monograph No. 1 (Ysseldyke, Christenson, McVicar, Bakewell, & Thurlow, 1986).

In this monograph, literature reviews and selected studies are summarized in the areas of teacher effectiveness and teacher decision making. The monograph concludes with a summary of the contributions each literature area makes to characterizing the nature of instruction and to identifying important variables for promoting positive student learning outcomes.

Teacher Effectiveness

The literature on teacher effectiveness has focused to a large extent on the characteristics of a good teacher. Research that has been conducted in this area and information that has been summarized contributes to our understanding of the nature of the instructional environment. In summarizing the teacher effectiveness literature, we deal first with some paradigms for research on teaching, and then with findings about the characteristics of a good teacher.

Paradigms for Research on Teaching

Doyle (1977) summarized the research on teacher effectiveness by organizing it according to three paradigms: (a) process-product, (b) mediating-process, and (c) classroom ecology. Each of these is discussed briefly.

Process-Product Paradigm. In this paradigm it is assumed that the teacher is the single most important influence on student achievement, that teacher behaviors have a direct causal impact on student outcomes, and that frequency often determines effects. The process-product research paradigm has been used extensively in teacher effectiveness studies, and those who have used it have identified numerous instructional variables related to student outcomes. Yet, making sense of the research is difficult. Roberts and Smith (1982) state: "Research related to quality of instruction is difficult to synthesize since studies focus on various student populations and the findings collectively look like laundry lists" (p. 20).

Doyle (1977) criticized research using this paradigm on two counts. First, those who use the paradigm view teacher behavior as stable. Doyle argues that teacher adaptation to momentary classroom conditions actually may be more significant in explaining achievement variation for students. Important dimensions ignored by this paradigm are timing, qualitative dimensions of teacher behavior, and instructional materials (e.g., appropriateness of text to reading levels). Doyle also criticizes the paradigm for not containing theoretical principles that guide the selection of variables of interest or the interpretation of results. Selection decisions often are based on personal preference or empirical criteria.

Doyle (1977) contends that the lack of formal explanatory propositions is a weakness since it has been difficult to interpret contradictory findings.

Similarly, Good (1983) has cautioned against blind application of specific research findings because of our limited knowledge about those factors promoting student achievement in different classroom settings. Goodlad (1979) adds:

> Too many researchers are preoccupied with research on single instructional variables that rarely account for more than 5% of the variance in student outcomes. Too few study the complex phenomena of schooling in their natural environment, developing the needed new methodologies instead of seeking to adapt the old." (p. 347)

On a positive note, Doyle indicates that researchers using this paradigm have recently given greater attention to a wider range of process variables (e.g., pace, time allocation, classroom management practices) and more emphasis to a variety of "context" variables such as grade level, content, and student characteristics.

Mediating-Process Paradigm. In this paradigm, variations in student learning outcomes are seen as a function of the mediating activities employed by students during the learning process. In turn, mediating processes used are influenced by instructional conditions. Teacher behaviors and instructional materials thus are seen as influencing, but not causing, student learning. The teacher's function is to activate the student's information processing responses; it is assumed that similar teacher behaviors will have very different effects on different students under different conditions. Doyle (1977) notes that use of this paradigm is growing and is reflected in teacher effectiveness studies in which measures such as student attention, task persistence, and time utilization are incorporated. Harnischfeger and Wiley (1976) used the mediating-process structure in their research relating quantity of schooling to achievement. In their model, effective teacher behaviors were those that positively influenced student academic engaged time.

Doyle (1977) also indicates that current research within this paradigm reflects a bias toward overt manifestations of student mediating responses. Time on task is a gross measure of an information processing response; by its nature, this response is inferred rather than a directly observable operation. Recently, research using this paradigm has moved from laboratory work on gross learning to the naturalistic study of student cognitions about classroom instruction (see Monograph No. 6, Thurlow, Ysseldyke, & Christenson, 1987).

Classroom Ecology Paradigm. Those who use this paradigm focus on the mutual relations among environmental demands, teacher, and student responses necessary to meet successfully demands in natural classroom settings. Doyle (1977) defined the formal task structure of the classroom as an exchange of performance for grades. The task of the student is to interpret environmental demands in a way that facilitates obtaining acceptable grades. Doyle contends that teachers tend to leave performance expectations unstated. He also contends that because of the teacher's attempt to cope with the complex demands of the classroom environment, the teacher is highly inconsistent in reacting to student responses. The ambiguity that results for students, compounded by the number of different teachers that the student has during schooling, means that students have to determine specific rules of successful performance under different circumstances.

Doyle (1977) contends that a competent student learns the classroom cues that signal performance expectations and learns to compensate for the unreliability and inconsistency of classroom cues such as incomplete teacher instructions. Doyle has identified a set of strategies a student has to acquire to adjust to environmental complexity and to learn. He includes "differential"

attentiveness; differentiating between positive and negative forms of the teacher's reactions, monitoring a wide band of information sources, including the responses of fellow students, test questions and teacher's comments on written assignments; continuous attention to situational indicators of response expectations, and patience. "In view of the repetitiveness and delays in the flow of classroom life, patience is one of the most salient skills required for student success. Patience may account, in part, for differential student ability in attending to classroom events" (p. 181).

Doyle (1977) concluded that aspects of teaching, separable for statistical analysis, are interrelated in natural classroom settings. He states,

> Attempts to attribute differences in student achievement to a few generalizable dimensions of teacher behavior or instructional materials may well be futile....teacher effectiveness formulations should include both contextual variables and the meanings teachers and students assign to the events and processes that occur in classrooms....the teacher effectiveness question itself might best be changed from 'which instructional conditions are most effective' to 'how do instructional effects occur?' (p. 188)

Summary. Contextual variables are critical and necessary to understanding student performance. Naturalistic studies involving classroom observation, interviewing, and documentation of naturally occurring events are supported by each of the paradigms. The task of describing instruction is complex and is the result of a complex interaction of many factors. Thus, the instructional experience most likely differs for different students in the same classroom.

Characteristics of an Effective Teacher

Several reviews of teacher effectiveness (more specifically, the link between specific teacher behaviors and student achievement) exist (Blair, 1984; Brophy & Good, 1986; Englert, 1984; Good & Brophy, 1984; Guzzetti & Marzano,

1984; Medley, 1979). Different lists of effective teacher behaviors overlap. Some lists are restricted to a specific content area (e.g., Guzzetti & Marzano, 1984). The lists vary in terms of the number of studies reviewed, the empirical basis from which the list is derived, and the detail and specificity of the teacher behaviors or effective instructional characteristics identified. Most research is focused on characteristics of teachers that facilitate achievement gains with regular education students. Research supports the belief that the teacher makes a difference in student achievement, particularly as an effective classroom manager, instructional organizer, and active instructor.

Medley (1979) reviewed 289 empirical investigations of teacher effectiveness. His summary of differences in teacher behaviors identified as effective and ineffective with low SES students in the primary grades is listed in Table 1. This list was generated from only those studies in which (a) teacher effectiveness was measured in terms of student achievement gains over several months, (b) clear observation schedules were used rather than rating scales of behaviors, and (c) behaviors were verified by more than two studies. Medley's findings about maintenance of the learning environment and use of pupil time are supported by other researchers (e.g., Englert, 1984; Good & Brophy, 1984). However, his findings about method of instruction, particularly the findings that effective teachers provide less feedback and discussion of pupil answers (see Table 1), conflict with findings reported in two correlational studies (Anderson, Evertson, & Brophy, 1979; Stallings & Kaskowitz, 1974). Medley found that effective teachers of low socioeconomic students do not encourage their students to evaluate or discover the logic behind their answers. Instead, they emphasize basic skill development by presenting students with questions

Table 1

Differences between effective and ineffective teachers of disadvantaged pupils in the primary grades verified in two or more independent studies

	Behavior of Teacher	
Teaching Function	Effective	Ineffective
Maintenance of Learning Environment	Less deviant, disruptive pupil behavior	More deviant, disruptive pupil behavior
	Fewer teacher rebukes	More teacher rebukes
	Less criticism	More criticism
	Less time spent on classroom management	More time spent on classroom management
	More praise, positive motivation	Less praise, positive interaction
Use of Pupil Time	More class time spent in task-related "academic" activities	Less class time spent in task-related "academic" activities
	More time spent working with large groups or whole class	Less time spent working with large groups or whole class
	Less time spent working with small groups	More time spent working with small groups
	Small groups of pupils work independently less of the time	Small groups of pupils work independently more of the time
	Less independent seatwork	More dependent seatwork
Method of Instruction	More "low-level" questions	Fewer "low-level" questions
	Fewer "high-level" questions	More "high-level" questions
	Less likely to amplify, discuss or use pupil answers	More likely to amplify, discuss or use pupil answers
	Fewer pupil-initiated questions and comments	More pupil-initiated questions and comments
	Less feedback on pupil questions	More feedback on pupil questions
	More attention to pupils when they are working independently	Less attention to pupils when they are working independently

Note: From "The effectiveness of teachers" by M. M. Medley, in Research in teaching (p. 23) edited by P. L. Peterson and H. J. Walberg, 1979, California: McCutchan.

requiring one or two word answers. Effective teachers are very visible in the classroom, interacting with their students in a question-answer format and in frequent direct supervision of seatwork. Medley's findings showed that student achievement is low when students are assigned a lot of seatwork to do totally independently. Teacher supervision was a primary characteristic of effective teachers with low SES students; this finding is supported by the direct instruction literature (see Monograph No. 4, Christenson, Thurlow, & Ysseldyke, 1987).

In her review of the teacher effectiveness literature, Englert (1984) summarizes the strong relationship between specific teacher variables and student achievement within the three teaching domains of classroom management, instructional organization, and lesson presentation. Based on the belief that teachers must self-monitor and self-regulate their teaching practices in order to be effective, Englert developed a methodology that allows teachers to self-evaluate their teaching practices in these three domains. Categories of instructional practices of successful teachers are presented in Table 2. Englert argues that teachers make a difference and influence students' learning by managing their classroom environments so that students are engaged in academic tasks that are academically relevant and for which they are provided explicit instruction and adequate practice. An effective teacher pays careful attention to classroom management, instructional organization, and lesson presentation.

Several individuals have identified specific behaviors of teachers in promoting reading and math achievement. Although these were derived from specific content areas, the identified behaviors are applicable to learning in

Table 2

Category of Effective Teachers' Instructional Practices

Classroom Management
· Classroom Setup and Organization
· Teaching Rules and Procedures
· Maintaining Rules and Procedures
Instructional Organization
· Allocated Time
- Lesson Scheduling and Management
- Small Group Instruction
- Tutoring Systems
· Engaged Time
- Monitoring Seatwork
- High Student Accuracy
- Student Accountability
Lesson Presentation
· First Phase: Review, Expectations, Preparation, Overview
· Second Phase: Active Demonstration, Student Practice
· Third Phase: Repeated Practice Opportunities and Feedback

Note: From "Measuring teacher effectiveness from the teacher's point of view" by C. S. Englert, 1984, Focus on Exceptional Children, 17, 1-14.

general. Guzzetti and Marzano (1984) and Blair (1984) reviewed school and teacher effectiveness research as it relates specifically to reading achievement of elementary school students (see Table 3). Good and Brophy (1984) reviewed a series of eight correlational and five experimental studies linking teacher behavior to student learning gains in basic skills in reading and mathematics. Eight factors characterize effective instruction in basic skills:

(1) Teacher expectation/role definition/sense of efficacy: Teachers who produce greater student achievement accept the responsibility for teaching, believe they are capable of teaching their students successfully, and reteach students if they do not learn something the first time.

(2) Student opportunity to learn: Most of the available time is allocated to instruction.

(3) Classroom Management and Organization: Classrooms are organized as effective learning environments and group management approaches are used in order to maximize student engagement in academic activities.

(4) Curriculum Pacing: Movement through the curriculum is rapid, but in small, sequential steps that minimize student frustration and enhances continuous progress.

(5) Active teaching: Instruction is in large and small groups--demonstrating skills, explaining concepts, conducting participatory and practice activities, explaining assignments, and reviewing when necessary. The academic content is made personally relevant for these students; there is not total reliance on directions and activities in published curriculum materials.

(6) Teaching to mastery: After instruction of new content, these teachers provide opportunities for practice and application. They monitor each student's progress, provide feedback and remedial instruction when needed, and assure mastery to the point of overlearning.

(7) A supportive learning environment: Although there is a strong academic focus, the classroom is pleasant and friendly and the teachers are enthusiastic and supportive.

(8) Grade level differences: In the early grades, successful teachers interact frequently with students on a one-to-one basis (often within small group settings) and provide frequent opportunities for overt practice with feedback. In the upper elementary grades, successful teachers rely more on whole-class settings for

> introducing new material, using small groups primarily for remedial activities. Students work cooperatively or independently for longer periods, although teachers continue to monitor progress and provide necessary assistance and feedback.

Instructional practices of effective teachers are strikingly similar. In addition, Guzzetti and Marzano (1984) emphasize that teacher beliefs and perceptions about themselves, students, and teaching are as important as the use of specific instructional practices. In particular, Blair (1984) sees the teacher as a key variable; what the teacher does in the classroom makes a difference, regardless of student characteristics. Blair's position is summarized by the belief that the more time the teacher spends directing and guiding a student's learning, the better the chance that student's achievement will be enhanced. The instructional behavior of effective reading teachers (see Table 3), Blair argues, is within the teacher's control and is accomplished in varied ways depending on the teacher's style.

Teacher effectiveness with special education students is a relatively new research area. The notion that an active, questioning teacher is most effective with special education students is supported in two studies. In one study, the relationship between observers' ratings of teacher behaviors and elementary special education students' achievement gains in reading was examined. Larrivee and Algina (1983) observed 118 elementary grade (K-6) classes four times, concentrating on the mainstreamed special education student (most were classified as learning disabled). The students' reading achievement was correlated positively with higher ratings of teachers for efficient use of time, supportive response to low-ability students, high frequency of positive feedback for student performance, and good relationships with students. Negative academic correlates included time spent off-task or in transitions and the

Table 3

Effective Teachers' Instructional Practices in Reading

Guzzetti and Marzano (1984)	Blair (1984)
1. Teacher Beliefs • High expectations • Beliefs in the basics • Dissatisfaction with the status quo	1. Opportunity to Learn • High coverage of material • High academic engaged time
2. Teacher Practices: Instructional • Clearly stated and specific goals for themselves and their students • Use of a diagnostic-prescriptive approach • Careful monitoring of student progress • Use of teacher-student interaction rather than reliance on materials, media, or learning stations • Use of supplemental materials to meet individual needs • Ample opportunity to apply new skills and concepts in various contexts • Use of a district pattern of questions and feedback (interactive behavior including discussion, review, corrective feedback)	2. Diagnosis leads to placement of student at appropriate instructional level 3. Use of direct instruction (structured classroom, teacher-led instruction, direct explanation by definition and example, frequent repetition and drill, immediate feedback) 4. Emphasis on transfer of skills through varied, sufficient, and meaningful practice 5. Use of flexible groupings (small and large groups) 6. Establish a positive mind set: • Teachers perceived as responsible for quality of instruction delivered • Positive expectancies held for students
3. Teacher Practices: Organizational • Use of varied grouping practices • Collaborative planning with colleagues • An emphasis on building-level staff development • Efficient use of instructional resources (time, personnel, materials)	7. Classroom Management • Classroom routines are developed to maximize academic engaged time

teachers' frequency of interventions for misbehavior. Positive, but nonsignificant correlations with achievement were found for three teacher behaviors: frequency of easy questions, correct student responses, and teacher assistance in improving incorrect responses; however, these three teacher behaviors were significant correlates of academic engaged time. These findings suggest that an effective teacher with special education students is one who keeps students actively engaged in learning by carefully monitoring and adjusting instruction to maintain high rates of success. In general, data on achievement correlates for mainstreamed special education students are consistent with the findings for low-SES and low achieving students in other elementary grade studies (see Christenson et al., 1987).

The relationships between the allocation of instructional time in 30 special education classes and reading achievement for LD and EMR elementary school students was examined in a recent observational study (Sindelar, Smith, Harriman, Hale, & Wilson, 1986). The Classroom Activity Recording Form (CARF) (Sindelar, Smith, & Harriman, 1986) is one in which observers are required to record classroom activities (Teacher-Directed Instruction, Independent Work, Noninstructional Activities) and student engagement every 10 seconds. Reading achievement gains were measured on the vocabulary and comprehension subtests of the California Achievement Test (Tiegs & Clark, 1977). The proportion of time spent in teacher-directed instruction accounted for a significant amount of variance in achievement gain for LD and EMR students. Time spent in independent instructional activities (silent reading, reading assistance) during reading was unrelated to achievement gain for both groups. Categorical differences were found. LD students benefitted from observing teacher-peer interactions about

academic material. The amount of time LD students observed the teacher questioning and monitoring another student was significantly correlated with achievement gain for LD but not for EMR students. The authors concluded that effective special education teachers of learning disabled and mildly retarded elementary students actively interact with students, asking many questions and monitoring student responses carefully. These results are consistent with previous findings in special education resource classes for LD students (Leinhardt, Zigmond, & Cooley, 1981) and regular education settings (Stevens & Rosenshine, 1981).

Teacher Decision Making

Jackson (1968) estimated that teachers make as many as 1,300 decisions daily. They make decisions before, during teaching, and after teaching a lesson. Decisions made before teaching are referred to as pre-active decisions; these include what to teach, materials and activities to use, and the approximate length of the instructional unit. Decisions made during teaching are referred to as interactive decisions and include monitoring of student performance, behavior, and involvement. Evaluative decisions are made after teaching a lesson; these involve evaluation of the lesson and subsequent planning for students.

Within the past 12 years, a major focus of teacher effectiveness research has been the study of teacher decision making. In contrast to the process-product studies of teacher effectiveness, which tend to prescribe what teachers "should do," in this area a mediational research paradigm is used; teachers are given frameworks for thinking about what they want to accomplish and how they want to accomplish it.

There are two assumptions in research in this area. First, teachers are perceived as rational professionals who implement decisions in an uncertain, complex environment (Shavelson, 1983). This assumption of rationality refers to teachers' intentions for their decisions rather than to their behavior. There are two reasons for this limitation. First, some teaching situations demand immediate responses that preclude methodical processing of information used in making informed judgments or decisions. In addition, a person's capacity for remembering and simultaneously solving many complex problems (such as those present when teaching 25 students) is small. Therefore, within the constraints of this complex environment, the conception of teachers as rational can be thought of as one in which it is assumed that teachers behave reasonably in making judgments and decisions. The second assumption is that teachers' behavior is guided by their thoughts, judgments, and decisions. Researchers in this area purport that teachers' cognitions, specifically how teachers gather, organize, interpret, and evaluate information about students and classroom life, are critical for understanding the instructional process. Teaching has been described as a constant stream of decisions (Hunter, 1979) and as being highly influenced by what teachers think (Clark & Yinger, 1979). Shavelson (1973) contends that decision making is the basic teaching skill.

Methods for studying teachers' thinking processes are somewhat different from methods used in correlational and experimental research. The methods that have been used most often to study teacher thinking include: (a) presenting hypothetical judgmental tasks in laboratory settings (policy capturing and lens modeling studies), (b) asking teachers to "think aloud" while performing a task, solving a problem, or making a decision (process-training and stimulated recall

tasks), and (c) qualitatively describing teacher behavior and classroom context (case studies and ethnography). Although teacher decision making has only been studied for slightly over a decade, the data base is extensive enough to allow several generalizations and models for understanding and improving instruction.

In compiling this review, several reviews and research studies were read. Comprehensive reviews of the literature have been written by Shavelson and Stern (1981) and Shavelson (1983). This section is organized into three parts: (1) generalizations from teacher decision-making studies; (2) description of teacher decision-making models; and (3) discussion of teacher self-efficacy, a factor related to teacher decision making.

Research Generalizations

Several generalizations about teachers' thoughts and instructional decision making appear in various reviews (e.g., Calfee, 1981; Shavelson, 1983; Shavelson & Stern, 1981). The generalizations, discussed in six categories (the kind of information used, focus of instructional planning, use of curriculum objectives, judging the lesson implementation, use of time, and accuracy in judging student performance) represent the kinds of instructional decisions teachers make for a student.

Information used. Teachers tend to use the most relevant information at hand when making instructional decisions for students (Borko, Shavelson, & Stern, 1981; Shavelson & Borko, 1979). Teachers have available large amounts of information about students. Teachers usually seek information about students' abilities, achievement, self-esteem, social competence, independent work habits, classroom behavior, and class participation (Shavelson & Stern, 1981). This information comes from varied sources, including their own observations,

anecdotol reports of previous teachers, test scores, and school records. This information must be integrated or reduced in order to make decisions. Research tends to support the notion that teachers use the most immediate, relevant information available to describe students and make teaching decisions. For example, reading and math scores are used to make estimates of the likelihood of success on specific skills. The student's previous behavior is used to form estimates of disruptiveness; these estimates are used to make management decisions. Finally, students are grouped primarily on the basis of ability; infrequently, lack of materials and other resources are the basis for grouping decisions.

Teachers' decisions influence the nature of instruction experienced by students. For example, teachers' plans differ considerably for students as a function of reading group placement (Shavelson, 1983). Flexibility in procedures and assignments and an emphasis on comprehension skills are planned and executed for high group students, whereas highly structured assignments and procedures and an emphasis on decoding skills and reading aloud are planned and implemented for low group students. Instruction generally is planned for the group, not the individual student. Therefore, the kinds of skills taught to a student are highly influenced by the student's group placement.

Focus of instructional planning. Teachers' instructional planning begins with considerations of the content to be taught and the setting in which the teaching will occur, rather than with clearly specified goals or objectives. The activity or material, rather than the goal or objective, seems to be the unit of planning (Calfee, 1981; Shavelson, 1983). Teachers focus on tasks, and embedded in the tasks are teachers' concerns about content, activities,

students, and goals. Teachers emphasize allocation of time, sequencing and pacing of content, and materials during the lesson. After their initial focus on materials and activities, the focus shifts to student involvement. Jackson (1968) speculated that the primary concern of teachers in classrooms is keeping students involved in learning:

> Teachers seem to be making some kind of educated guess about what would be a beneficial activity for a student or group of students and then doing whatever is necessary to see that participants remain involved in that activity. The teacher's goal, in other words, is student involvement rather than student learning...: learning is a by-product rather than the thing about which the teacher is most directly concerned. (Jackson, 1968, p. 24)

However, Shavelson notes conflicting findings about teachers' consideration of goals and objectives. Teachers' verbal reports and lesson plans (in naturalistic, qualitative studies) do not emphasize goals and objectives in instructional planning. In contrast, laboratory simulation studies in which teachers were asked to make decisions about goals or objectives suggested that teachers take objectives into consideration and that the objectives are consistent with their classroom planning. Shavelson attributes the discrepant finding to methodological differences, reiterating Morine-Dershimer's (1978-79) point that objectives are part of teachers' mental images or plans, not part of their verbal reports about plans. Consequently, direct or indirect probing, as in simulations or interviews, are recommended procedures for determining a teacher's use of goals or objectives.

Use of curriculum objectives. Teachers give little thought to curriculum objectives unless they are found in curriculum guides and teachers' manuals (Durkin, 1978). Frymier (1981) notes that teachers begin with curriculum materials, not with instructional objectives, and that these materials (e.g.,

textbook, workbook, ditto sheet, filmstrip) too often are unrelated to any meaningful outcome. He facetiously states, "one explanation for the generalization that time-on-task is directly related to achievement may be a function of the fact that, when the task itself requires the learner to make sense out of meaningless curriculum materials, more time results in more learning" (p. 634). Anderson (1984) pessimistically notes that if this situation persists:

> Students will very likely continue to engage in learning experiences and use a variety of curricular materials but precisely what they are to learn from the experiences and materials will very likely remain unclear to both students and teachers. (p. 66)

Several researchers (e.g., Anderson, 1984; Doyle, 1979; Frymier, 1981; McNamara, 1981; Shavelson, 1983) underscore that goals not materials, tasks or activities, need to be the primary unit of instructional planning.

Judging the lesson implementation. Research on teachers' planning reveals that instructional tasks -- content, materials, and activities in which to engage students -- serve as the teacher's mental plan or script for carrying out interactive teaching. The teacher's main concern during interactive teaching is to maintain the flow of the activity (Calfee, 1981; Shavelson, 1983). Teachers monitor student involvement or behavior problems as the primary indicators of the smoothness of the instructional process. While the students' ability to complete tasks with an appropriate success rate is less often a reason for changing teaching activities, it could be that students become unengaged when their assigned work is confusing. When interruptions occur, teachers consider alternatives, but rarely implement the alternatives in mid-stream, even when instruction is going poorly.

Teachers make selective choices about interacting with students of different ability levels (Shavelson, 1983). With shy or low achieving students,

teachers tend to carefully select respondents for their questions or frequently check the students assigned tasks; both of these routines serve to maintain the flow of classroom life.

Use of time. Ross (1984) discusses time as one of the teacher's most important resources. There is evidence that teachers vary widely in how they use instructional time (Berliner, 1979; Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980; Good & Brophy, 1984). The reader should note that the emphasis of these studies has been on how time is used in classrooms and schools rather than the ways in which the teacher decides to use the time available. Recently, Leinhardt (1985) recommended that researchers examine how teachers decide to distribute time across different content areas and for different students.

While the minimum amount of time scheduled for various subject areas often is specified for teachers (e.g., Minnesota State Department of Education, 1980), teachers make decisions about the kind of activities to assign and additional time to allocate to subject areas. Teachers vary widely in time allocations. For example, Fisher and colleagues found that time allocated for second grade math ranged from a low of 24 minutes to a high of 61 minutes; the range for second grade reading varied from 32 to 131 minutes. These differences in allocated times mean that students in the same grade and same subject area may receive as much as four times more instructional time than other students. Teachers assign tasks to students and thereby have a direct influence on students' academic learning time (Fisher et al., 1980). Fisher and his colleagues also found that the amount of time a student spends engaged in relevant academic tasks while completing the work with a high level of success

varies widely from classroom to classroom. Some second graders spend as little as 3 minutes per day successfully working on reading, whereas others spend as much as 42 minutes. In some classrooms there is a serious mismatch between the student's skill or ability level and the assigned work.

With regard to teachers' beliefs and decisions about time utilization, Good and Brophy (1984) suggested that teachers are not aware of how their time allocations for subject areas differ from those of other teachers, are not clear about what percentage of their allocated time can be considered as academic learning time, or how their classrooms compare on academic learning time with those of other teachers. They conclude that teachers need to be aware of how they spend classroom time. Some research indicates that teachers' time allocations for different subjects are influenced by their attitudes toward and confidence in teaching the subject. Schmidt and Buchmann (1983) found that teachers who enjoyed teaching reading more than writing spent more time in reading than language arts instruction. Teachers who enjoyed teaching math spent over 50% more time in math instruction than those teachers who did not. The authors conclude that it is necessary to develop teachers' knowledge of, and attitudes toward, all subject areas to the point that teachers believe they can be successful in teaching any content or skills.

Good and Brophy (1984) caution that time use may be due to classroom compositional factors or situational factors and not solely to teacher factors. However, some decisions about time are thought to reflect conscious decisions about how to use it.

Accuracy in judging student performance. When teachers make judgments about students and materials, they vary as to the accuracy of their predictions

of student performance (Shavelson, 1983). In the BTES study (Fisher et al., 1980) students' academic learning times varied widely from classroom to classroom because of the differences in teachers' success in attaining an appropriate student-task match.

A teacher's ability to judge student success on assigned tasks is critical for optimal student performance. It has been suggested that some teachers who allocate less time for a subject area actually may have higher levels of overall student performance because the students are involved in appropriate tasks (Good & Brophy, 1984). Large amounts of high success time (i.e., task appropriateness) is especially important for students with histories of low achievement (Marliave & Filby, 1985). Although the importance of assignments at the appropriate level of difficulty repeatedly is mentioned as necessary for instruction to be effective, the fact remains that teachers vary in their accuracy in assigning tasks, resulting in too many students working on tasks that are either too easy or too hard. It may be that teachers' use of the group for instructional planning contributes to the mismatch for an individual student.

Decision-Making Models

The previous section provided conclusions from research about teachers' decision making. This section presents what individuals believe are the guidelines for, or components of, good teacher decision making. Four models that describe teaching from a decision-making perspective are reviewed. Each model has a slightly different emphasis: (a) Shavelson and Borko (1979) discuss factors that contribute to teachers' pedagogical judgments and decisions; (b) Costa and Garmston (1985) describe a model for teacher supervision; (c) Calfee

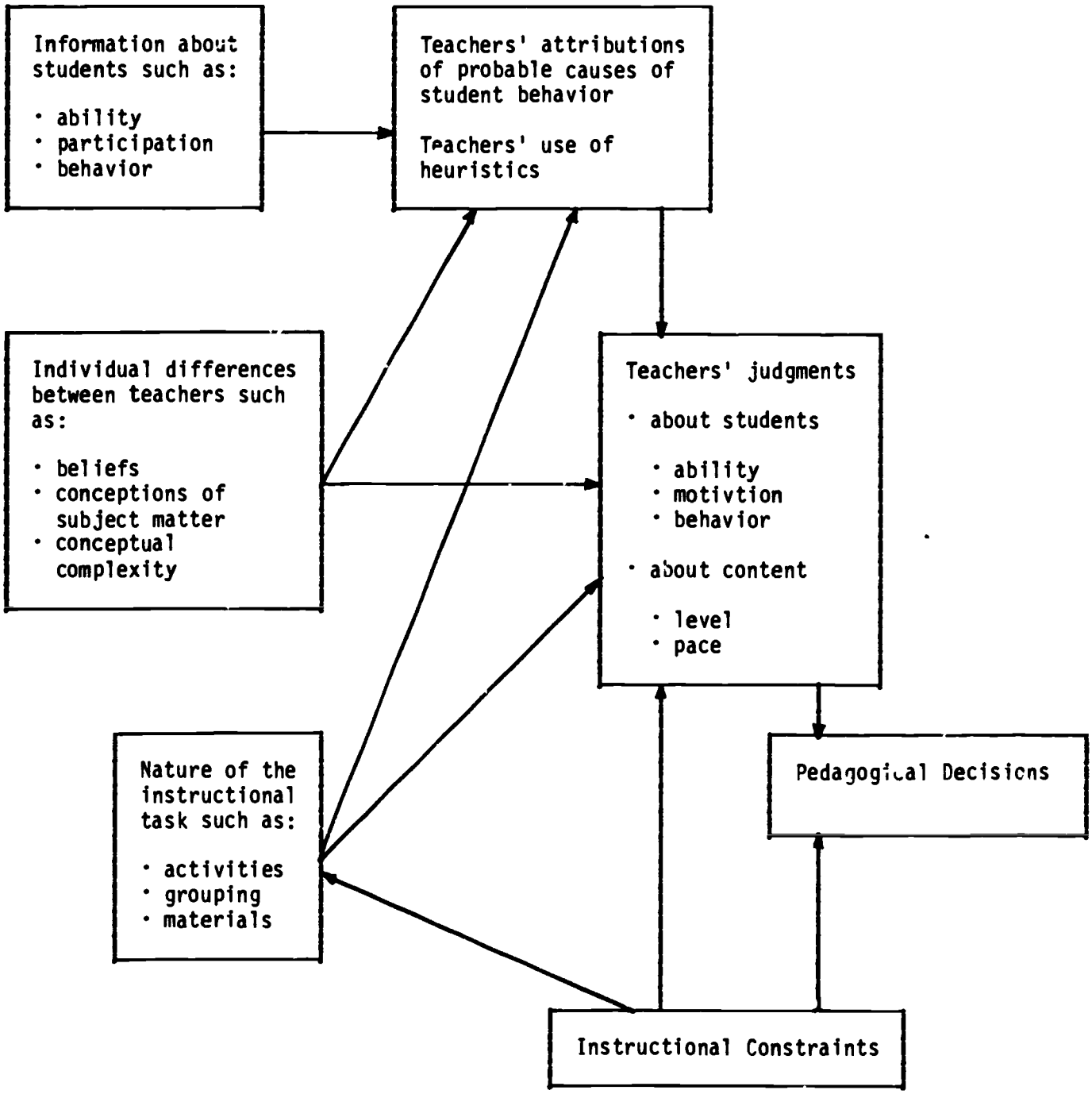
(1981) proposes a model for training teachers; and (d) Hunter (1979) summarizes factors for improving instruction. Although each model has a different emphasis, there is similarity among these models, suggeting that teachers' instructional decisions for a student should follow certain guidelines.

A teacher decision-making model. Factors contributing to teachers' pre-instructional decisions are addressed by Shavelson and Borko (1979). In this model, a teacher's instructional decisions are viewed as the result of seven interrelated factors: (1) student characteristics; (2) teacher's educational beliefs, theories, and models of instruction; (3) nature of the instructional task; (4) teacher's estimates of student aptitude; (5) availability of alternative instructional strategies; (6) institutional constraints (e.g., educational facilities, material resources, school politics); and (7) external pressures (e.g., pressure from the community, teacher training). The Shavelson and Borko model underscores the importance of teacher planning.

In subsequent refinement of the model, Shavelson and Stern (1981) placed less emphasis on external pressures and greater emphasis on teachers' attributions for student behavior. The model, which is presented in Figure 1, assumes that teaching is a process by which teachers make reasonable judgments and decisions for the purpose of optimizing student outcomes (Shavelson, 1976). Teachers have many instructional techniques available to assist students in reaching goals. In order to select from this repertoire of methods, teachers must integrate a large amount of information from many sources. Next, they must relate this information to their own beliefs and goals, the nature of the instructional task, and the constraints of the situation in order to reach an instructional decision.

Figure 1

Factors Contributing to Teachers' Decision Making



Note: From "Research on teachers' pedagogical thoughts, judgments, decisions, and behavior" by R. J. Shavelson and P. Stern, 1981, Review of Educational Research, 51, 472.

Teachers' planning decisions are crucial for optimizing student success. According to Shavelson and Stern (1981), four components of planning are taught in teacher education programs. These include developing observable descriptions of student learning that are to result from instruction, identifying the student's present capability or entry knowledge, designing an instructional sequence or strategy that will most likely move students from their present capabilities toward immediate and long-range instructional outcomes, and anticipating a method of evaluating outcomes in order to design subsequent instruction. Although this prescriptive model of planning is emphasized in teachers' training, research indicates that it is not used in teachers' planning in schools (Calfee, 1981; Shavelson, 1983).

There is a mismatch between prescriptive planning components and the demands of classroom instruction. The need to maintain the flow of classroom activities is used to explain teachers' lack of use of the planning components. Since teachers are faced first and foremost with deciding what activities will engage students during the lesson, activities (not the components of prescriptive planning) become the focus of teacher planning. It has been suggested that most instructional planning is unsystematic and general in nature; "teachers appear uncertain as to what the planning process requires" (Shavelson & Stern, 1981, p. 479).

A supervision model. Costa and Garmston (1985) outlined a supervision procedure aimed at assisting teachers to make better instructional decisions. Premised on the notion that supervision must emphasize both overt teaching behaviors and teachers' thinking processes, the authors divide teaching decisions into four stages: planning (the pre-active stage), teaching (the

interactive stage), analyzing and evaluating (the reflective stage), and applying (the projective stage). Indicators of teachers' decision making during each of the stages are presented in Table 4.

In this model, planning involves Shavelson and Stern's (1981) four components and is viewed as including the most important decisions teachers make. The authors encourage the teacher's use of structural and operational task analysis when planning a teaching strategy. Structural analysis is the process of breaking down the content into its component parts, whereas operational analysis involves sequencing events into a logical order of learning activities (Clark & Yinger, 1979). Teaching (the interactive stage) is characterized by the teacher asking questions, probing, observing, and interpreting student behaviors in order to decide whether to move ahead in the instructional sequence. On-task behavior and student success are considered important cues for teacher decisions. Analyzing and evaluating (the reflective stage) occurs when the teacher mentally compares actual and intended outcomes of teaching. A match between behaviors predicted during the planning stage and those observed during the teaching stage is desired. If there is a mismatch, the teacher needs to generate reasons to explain the discrepancy. During applying (the projective stage), the teacher formulates hypotheses or future plans. The teacher's thinking needs to be characterized by "iffy" thinking: "If I were to do this lesson again, I would" or "From now on I am going to...."

A teacher education model. Calfee (1981) describes a model developed by Shefelbine and himself that attempts to account for the thinking processes utilized by a competent teacher. The components comprise the rational basis for teacher action in the classroom and include the teacher's conception of the

Table 4

Indicators of Specific Teacher Behaviors for Different Decision Making Stages

I. PLANNING (The Preactive Phase)

1. States relationship between this lesson and larger, long-range goal.
2. Provides descriptions of student learnings that will result from this instruction.
3. Envisions, describes an instructional strategy:

   _____ Content
   _____ Time sequencing
   _____ Group/structuring
   _____ Sequence of learning activities
   _____ Repertoire of teaching behaviors

4. Identifies data about students: previous learnings/entry/capabilities, and so on.
5. Anticipates a method of evaluating outcomes.

II. TEACHING (The Interactive Phase)

1. Deals with multiple activities (classification systems) simultaneously.
2. Uses clear and precise language.
3. Remembers strategy.
4. Monitors own progress along that strategy (meta-cognition).
5. Restrains impulsivity (ignoring selected behaviors, accepting).
6. Is conscious of and sensitive to behavioral cues coming from students (monitoring).
7. Alters teaching strategy based on cues coming from students (repertoire).
8. Routinizes classroom management tasks.

III. ANALYZING AND EVALUATING (The Reflective Phase)

1. Recalls data about student and teacher behavior from teaching experience.
2. Makes comparison between intended and actual outcomes.
3. Makes causal relationships as to why objectives were/were not achieved.
4. Self-evaluates own actions of planning, teaching phases (auto-criticism).
5. Displays internal locus of control.

IV. APPLYING (The Projective Phase)

1. Predicts or hypothesizes differences in learning outcomes if alternative strategies were to be used.
2. Plans future lesson strategies based upon principles abstracted from the analysis of previous lessons.
3. Makes a commitment to alter/experiment with own behaviors.

Note: From " Supervision for intelligent teaching" by A. L. Costa and R. Garmston, 1985, Educational Leadership, 42, p. 77.

student; knowledge of the curriculum and goal-setting skills; development of and selection of materials and activities; assessment and diagnosis; classroom management, including long range planning and handling of moment to moment interactions with students; and the teacher's relationship to the school as a social organization. The components of Calfee's model are strikingly similar to those advocated by Shavelson and Stern (1981) and Costa and Garmston (1985).

An instructional improvement model. The goal of Hunter's (1979) model is to promote teacher use of generalizations validated by psychological research rather than use of "folklore, fantasy, or impulse" when making instructional decisions. While she would not dispute the components included in the previous models (e.g., assessment of student needs), she places primary emphasis on the systematic application of learning principles during teaching. Teacher decisions are described as the result of teachers' propositional and conditional knowledge. Propositional knowledge refers to the use of learning principles in order to optimize student learning outcomes. Hunter advocates that teachers need to be taught propositional knowledge (e.g., massed practice increases speed of learning while distributed or spaced practice increases retention). Conditional knowledge refers to knowing when and why to use each proposition and is influenced by the specific conditions related to the content, the student, the teacher, and the situation that indicate modifications or different procedural skills are needed.

According to this model, effective instruction for a student depends on several teacher decisions: selection of a teaching objective at the correct level of difficulty, teaching to the intended objective, monitoring student progress and adjusting instruction, and systematic use of principles of

learning. The teacher draws from a repertoire of principles of learning, including:

1. facilitating active student participation
2. modeling and demonstrating what is to be learned
3. emphasizing the meaning (i.e., significance, purpose or value) of a task
4. using an anticipatory set to tie previous learning experiences with what is to be learned next
5. asking for closure (i.e., the learner summarizes what was learned)
6. encouraging student motivation through successful experience, knowledge of results, positive class climate, interactive activities, and student accountability
7. providing varied practice activities (massed, spaced) until a student is proficient
8. using appropriate reinforcement strategies and informative feedback

The teacher's selection of the appropriate principles of learning depends on the result the teacher wishes to achieve. During effective instruction, teachers analyze what they are doing and the effect it has on the student. If the effect is positive, the behavior is repeated; if not, a new behavior is selected. According to Hunter (1985), both propositional and conditional knowledge are needed to make effective decisions; in fact, "conditional knowledge is the essence of translating science into artistry in teaching" (p. 58).

Teacher Self-Efficacy

One of the factors affecting teachers' decision making is their beliefs about students, instruction, and teaching. Teacher self-efficacy refers to the teacher's belief that he/she makes a difference in the student's learning outcomes. As such, self-efficacy may influence the kinds of instructional decisions a teacher makes for an individual student.

Gibson and Dembo (1984) reviewed the evidence indicating that teacher efficacy accounts for individual differences in teaching effectiveness. They noted that the teacher's sense of efficacy was the most important determiner of the effectiveness of 100 Title III projects and the reading gains made by students in a comprehensive reading program evaluation. They also noted that teachers in high-achieving schools demonstrated a greater commitment to students' achievement, as evidenced by spending greater proportions of time in instruction. A related finding was reported by Brophy and Evertson (1977) in the Texas Teacher Effectiveness Study. Teachers who were successful in producing student achievement gains held higher expectations for their students and for themselves. They assumed personal responsibility for making sure that students learned. In those cases where students were not mastering skills, the teachers viewed the obstacle as being due to an inappropriate teaching method, not as being an indicator of the students' inability to learn.

Gibson and Dembo (1984) have developed an instrument to measure teacher efficacy and have provided construct validation support for the variable. They also have examined the relationship between teacher efficacy and observable teacher behaviors related to academic focus, feedback, and persistence in failure situations. They hypothesized that teachers who believe student achievement can be influenced by effective teaching (i.e., Teaching Efficacy) and who have confidence in their own teaching abilities (i.e., Personal Teaching Efficacy) should persist longer, provide a greater academic focus in the classroom, and exhibit different types of feedback than teachers who have lower expectations regarding their ability to influence student achievement. Teachers' sense of self-efficacy is based on the assumption that even the most

difficult or unmotivated student could be helped. The teacher's persistence with a student in a failure situation is conceptualized as indicative of the teacher's confidence in his/her teaching ability.

Gibson and Dembo found that teacher efficacy consists of at least two distinguishable factors, teaching efficacy (teaching makes a difference) and personal teaching efficacy (teacher has requisite skills to make a difference). Preliminary classroom observation data comparing four high efficacy and four low efficacy teachers revealed significant differences between the teachers' patterns of behavior. High efficacy teachers spent more time monitoring and checking seatwork, less time in small group instruction, more time in preparation and paper work, and were more effective in leading students to correct responses through cues, prompts and questioning. Both types of teachers provided opportunities for students to correct their responses, but low efficacy teachers were more likely to supply the answer, ask another student, or allow other students to call out the correct response. High efficacy teachers utilized error correction procedures (Reid, 1981). Although not statistically different, the mean difference favored high efficacy teachers on use of whole-class instruction and use of praise. Use of criticism following a student's incorrect response was not observed for high efficacy teachers.

The authors tentatively concluded that teacher efficacy is a valid construct leading to different teaching behaviors. Their research is particularly important in understanding qualitative differences in students' instruction. For example, a characteristic of effective instruction is the use of prompts and cues to lead the student to the correct response (Englert, 1984; Reid, 1981; Stevens & Rosenshine, 1981). Whether an individual student is

allowed the opportunity to interact and discuss with the teacher until the correct response is given or explained may depend on the teacher's sense of self-efficacy. Teachers who believe their efforts would make no difference in the student's learning may be more likely to move on to another student for whom they can make a difference.

Contributions of Teacher Effectiveness and Teacher Decision Making Literature to Understanding the Qualitative Nature of Instruction

Literature bases in the area of teacher effectiveness and in the area of teacher decision making point to several variables that can be used to describe the qualitative nature of instruction and that relate to positive student outcomes. The implications of each literature area are summarized here.

Teacher Effectiveness

Blair (1984) reviews general weaknesses in teacher effectiveness research, especially as it relates specifically to reading achievement. He indicates that (a) the majority of studies have been nonexperimental, eliminating causal statements; (b) much of the research on basic skill acquisition has been conducted with students from lower SES groups; and (c) research has focused predominantly on the acquisition of sequentially organized skills of word identification and comprehension as measured by standardized lists. On a positive tone, however, he notes that several independent studies have repeatedly identified the same characteristics of effective instruction, lending support for the notion that student achievement in basic skills is associated with certain teacher characteristics. In addition, comparison of effective regular and special education teachers results in similar characteristics, suggesting that an effective teacher is an effective teacher.

Blair stresses that the seven fundamentals of effective teaching listed in Table 3 are both interdependent and interrelated; ignoring one aspect affects the overall effectiveness of the teaching-learning environment. In their review of teaching effectiveness, Hawley and Rosenholtz (1984) provide important cautionary remarks. They state:

> There is no one best instructional system, no quick fixes, and no universal criteria of teacher excellence that can be applied in all contexts, with all students, for all goals of academic learning. Instead, it seems clear that in selecting appropriate instructional strategies, one must consider both the nature of the student population saved, particularly in regard to its academic heterogeneity, and the learning objectives to be accomplished. (p. 51)

An effective teacher is an active decision maker.

Teacher Decision Making

It is apparent that teachers make many kinds of decisions daily for many students before, during, and after teaching a lesson. The teacher decision making literature contributes to our understanding of the instructional process for a student in several ways. First, the literature contributes a framework for analyzing teachers' decision making, and thereby, identifies some components of effective instruction. The framework consists of diagnostic decisions (e.g., assessing the actual level of student performance), goal-setting decisions (e.g., the teacher's desired level of performance for the student), prescription and monitoring decisions (e.g., instructional modifications made in order to close the gap between the actual and desired levels of student performance), and evaluation decisions (e.g., methods to evaluate effectiveness of teaching methods).

Second, the literature illustrates the complexity of teaching and suggests how teachers deal with its complexity. In order to process simultaneously the

large amount of information present in a classroom, teachers develop routines or strategies. For example, teachers group students for reading instruction on the basis of ability and then plan instruction for the group. While this procedure may be effective in reducing the information "overload" for teachers, it may result in ineffective instruction for an individual student, particularly in terms of whether a handicapped student is working at the appropriate level of material with a high success rate.

Third, the literature underscores the importance of measuring teachers' decisions, particularly how they plan instruction for a student. There is a discrepancy between what individuals, models, or teacher training programs purport to be components of effective instructional decision making for students and how teachers actually make or execute decisions for students. This discrepancy is most apparent in teachers' planning decisions. Teachers' planning decisions are of critical significance since they set in motion subsequent instructional lessons for a student. Several researchers contend that goals must be the focus of decision making; however, teachers continue to focus on tasks or materials.

Fourth, teachers make different kinds of decisions for a student. These include assessment of ability or skill level, group placement, instructional goal, kinds of tasks, use of instructional time, evaluating student progress, etc. Decisions are made before, during, and after instruction. Some decisions require consideration only of the individual student; others require consideration of the classroom structure and needs of other students. In order to accurately understand the rationale for a teacher's decision, or the "reasonable behavior of a teacher" (Shavelson, 1983), an interview must be conducted.

Meeting a mildly handicapped student's instructional needs in mainstream and special education classrooms adds to the complexity of teachers' decision making. Instructional consultation (Rosenfield, in press) may be a viable way to reduce this complexity.

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