

# Supervision for Intelligent Teaching

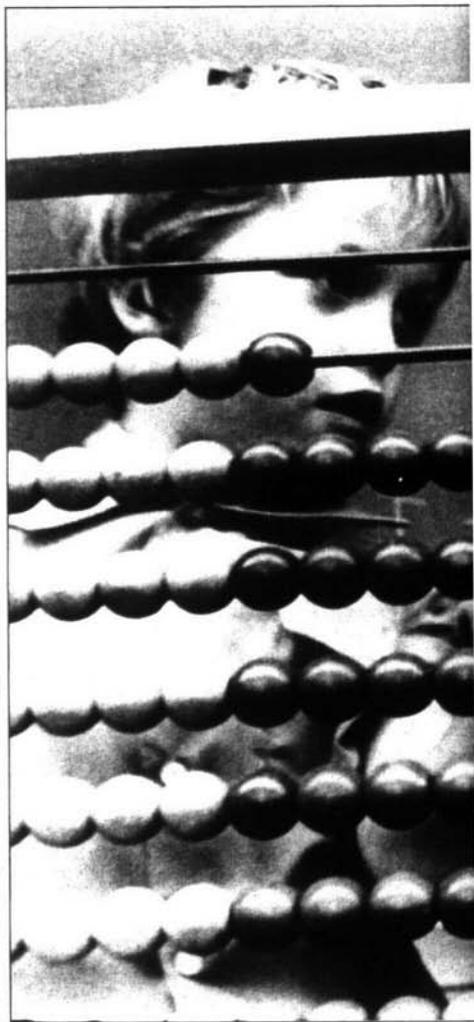
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Supervision can help teachers make better instructional decisions by enhancing their cognitive abilities.

During the past decade, a great deal of educational research and staff development effort has been devoted to identifying the *behaviors* of teaching. The teaching act has been dissected into various components, each of which has been correlated with student achievement test scores. Those behaviors that have correlated highly with achievement have become the basis for teacher preparation, evaluation, supervision, and staff development. Supervisors have been trained to observe, record, and positively reinforce teachers' use of these behaviors.

While behavioral training is helpful for some teachers, it has shortcomings. One is the fallacy that the act of teaching can be reduced to scientific, quantifiable, scalar values; for instance, counting the number of higher-level questions a teacher asks and then correlating that number with student achievement. This approach overlooks the teacher's decisions about *when* to ask *which* level of question under *what* circumstances. It also fails to consider what experiences or knowledge the teacher relies on in deciding which particular behavior to use and the intended effect of that behavior on student learning. Teaching has been described as a constant

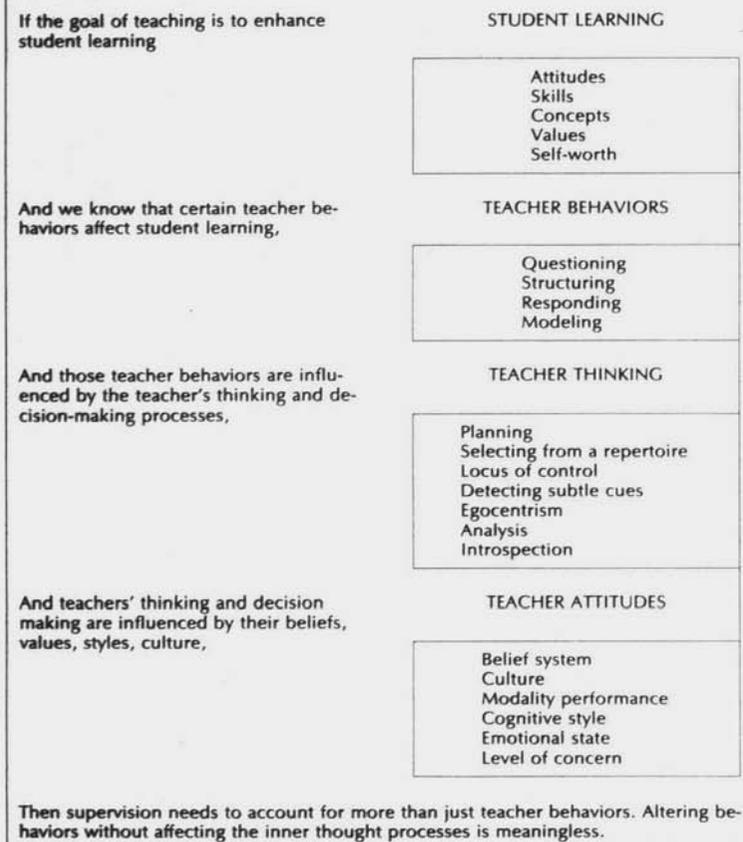
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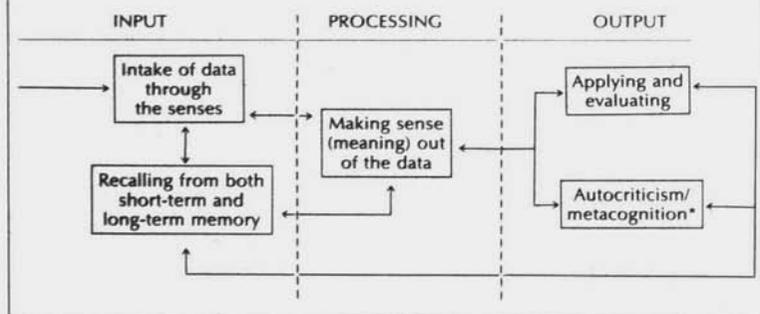


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**Figure 1. The Interrelationship of Teachers' Attitudes, Thinking, and Behaviors.**



**Figure 2. Information Processing.**



*stream of decisions* (Hunter, 1979). Jackson (1968) estimates that teachers make as many as 1,300 decisions each day. In making these decisions, teach-

ers use *intelligent* processes to guide their teaching behaviors (Blumberg, 1974; Ryan, 1979; Glickman, 1980). Superior teachers know how to select

specific teaching acts from their repertoire of behaviors based on what they know about their learners, the teaching task, and the instructional situation. They know how a particular act fits into a larger strategy and can predict the effects of that act on student learning. The aim of supervision and staff development, therefore, should be to help teachers make better decisions about instruction. In other words, it should appeal to, capitalize on, and enhance teachers' *cognitive processes* (Sprinthall and Theis-Sprinthall, 1983).

Figure 1 illustrates how student learning is related to teacher attitudes, thinking, and behaviors. Supervision should strive to enhance those intellectual skills that ultimately serve to increase learning.

### Enhancing Teachers' Thinking Skills

Figure 2, which omits such important concepts as affect, motivation, and perceptual abilities, nevertheless attempts to summarize many psychological and psychobiological concepts of human information processing, which can serve as a basis for supervisory decision making.

According to this model, the individual constantly interprets information in terms of what is already known. If a teacher can easily understand new information based on existing knowledge (*assimilation*), then there is no problem or challenge. If, however, the teacher cannot assimilate the new information, that information must be processed, more information collected, and the ultimate resolution tested for its fit with the teacher's reality (*accommodation*). Thus, a problem may be defined as a stimulus or challenge to which the response may not be readily apparent.

The supervisor, then, is a crucial mediator of teachers' intelligent behavior. To stimulate the teacher's intellectual skills, the supervisor calls attention to discrepancies between intended and actual learning outcomes and poses problems intended to invite more than a memory-type response (Fishler, 1971). The supervisor's questions and statements can be designed to elicit specific cognitive functions

that produce data, relationships, and generalizations to help resolve the problem.

Teaching decisions fall into four categories: *planning* (the preactive stage), *teaching* (the interactive stage), *analyzing and evaluating* (the reflective stage), and *applying* (the projective stage).

### Planning: The Preactive Stage

*Planning* consists of those intellectual functions performed prior to instruction. Psychologists have found that capable adults can handle and coordinate an average of only seven (plus or minus two) different variables, decisions, or disparate pieces of information at any one time (Miller, 1956). When they approach the limits of their capacity, they begin to feel tension and loss of control. Much intellectual energy is invested in techniques and systems to simplify, reduce, and select the number of variables with which the intellect has to deal. Planning helps to reduce the stress (Harvey, 1966).

Yinger (1977) identified five frames of planning: long-range, term, monthly, weekly, daily. During planning a teacher can:

- Evoke thought experiments or mental rehearsals of activities in anticipation of possible events and consequences.

- Describe cues—definitions of acceptable student performance—for learning, and thus simplify judgments about appropriate and inappropriate student behaviors.

- Select potential solutions, back-up procedures, and alternative strategies for those times when a learning activity needs to be redirected, changed, or terminated (Newell and Simon, 1972).

Since planning is the design phase upon which the other three phases rest, it includes some of the most important decisions teachers make. Planning basically involves four components (Shavelson, 1976, p. 383; Shavelson and Stern, 1981):

1. *Developing descriptions of student learning that are to result from instruction.* These are predicted in explicit or observable student behaviors. Zahorik (1975) found this a low priority for teachers, however.

2. *Identifying the student's present capabilities or entry knowledge.* Information about students is drawn from such sources as previous teaching

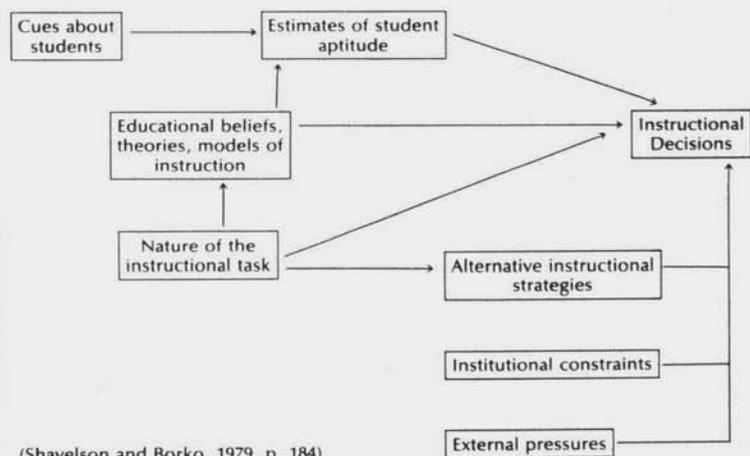
learning experiences, data from school records and test scores, and clues from parents, previous teachers, and counselors (Shavelson, 1977; Borko, Cone, Russo, and Shavelson, 1979). To handle this information overload, teachers probably synthesize much of this information into hypotheses, or best guesses, about student readiness for learning. They estimate the probability of successful student behavior as a result of instruction (Coladarchi, 1959). Planning a lesson using information about students requires a teacher to overcome egocentrism and to view the learning from the student's point of view—how the lesson will be perceived and received by the student.

3. *Envisioning the characteristics of an instructional sequence or strategy that will most likely move students from their present capabilities toward immediate and long-range instructional outcomes.* Planning a teaching strategy requires task analysis—both structural and operational. *Structural* analysis is the process of breaking down the content into its component parts, while *operational* analysis involves arranging events into a logical sequence of learning activities (Clark and Yinger, 1979). This sequence is derived from whatever theories or models of teaching, learning, or motivation the teacher has adopted.

4. *Anticipating a method of evaluating outcomes.* This evaluation provides a basis for making decisions about the design of the next cycle of instruction.

During the planning phase, the teacher can use a wealth of information because there is enough time to call it from memory. Factors that teachers may take into consideration during instructional planning are represented in Figure 3. Planning may be done in a formal setting—thinking, writing, and devoting attention to it—or informally—while driving to work, washing dishes, and so forth. This unpressured planning contrasts sharply with the interactive phase of teaching when teachers must respond quickly to the immediate demands of the situation without time to reflect before acting.

Figure 3. A Model of Instructional Planning



(Shavelson and Borko, 1979, p. 184).

**“Superior teachers not only know how to ask a range of questions; they also know *when* to ask them.”**

#### Teaching: The Interactive Stage

The *teaching* stage includes all decisions made during the immediacy and spontaneity of classroom interactions. These decisions are probably more intuitive and unconscious than the rational decisions of the planning phase because in the process of constantly interacting with students, teachers are often under pressure and in a state of uncertainty. There may be little time to consider alternative teaching strategies and the consequences of each; and insufficient data about students' readiness for learning may be observed or recalled (Calfee, 1981). The capacity to juggle these many factors simultaneously is a prerequisite to effective classroom teaching.

Superior teachers have the capacity to operate under *multiple classification systems* simultaneously. This capacity means that they can teach toward both immediate and long-range goals concurrently. They perceive relationships between day-to-day student behaviors and their cumulative progress toward long-range educational outcomes, and they can prioritize goals and objectives so that they know which student behaviors to rein-



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force and which to ignore. They can simultaneously orchestrate multiple student activities, teaching strategies, and learning modalities (Kounin, 1970).

A teaching strategy is a plan of action that includes a sequentially ordered set of teacher behaviors designed to produce a desired student outcome. Keeping the script or planned strategy in memory while teaching allows teachers to make temporal and comparative judgments; to assess student readiness for more or different learnings; and to monitor their own interpretations, perceptions, decisions, and behaviors. This self-awareness is referred to as *metacognition* (Berliner, 1982; Rohrkemper, 1982).

Rigney (1980) identified the following self-monitoring skills as necessary for successful performance on intellectual tasks: keeping one's place in a long sequence of operations, knowing that a subgoal has been obtained, detecting errors, and recovering from those errors by making a quick fix or by retreating to the last known correct operation. Such monitoring involves both looking ahead and looking back. Looking ahead includes learning the structure of a sequence of operations, identifying areas where errors are likely, choosing a strategy that will reduce the possibility of error and provide easy recovery, identifying the kinds of feedback that will be available at various points, and evaluating the usefulness of these kinds of feedback.

Looking back includes detecting errors previously made, keeping a history of what has been done to the present and thereby what should come next, and assessing the rationality of the present immediate outcome of task performance.

Thus, the teacher must make temporal decisions as to when and how fast to move through the steps in a sequence. When are students properly motivated? How much data should be

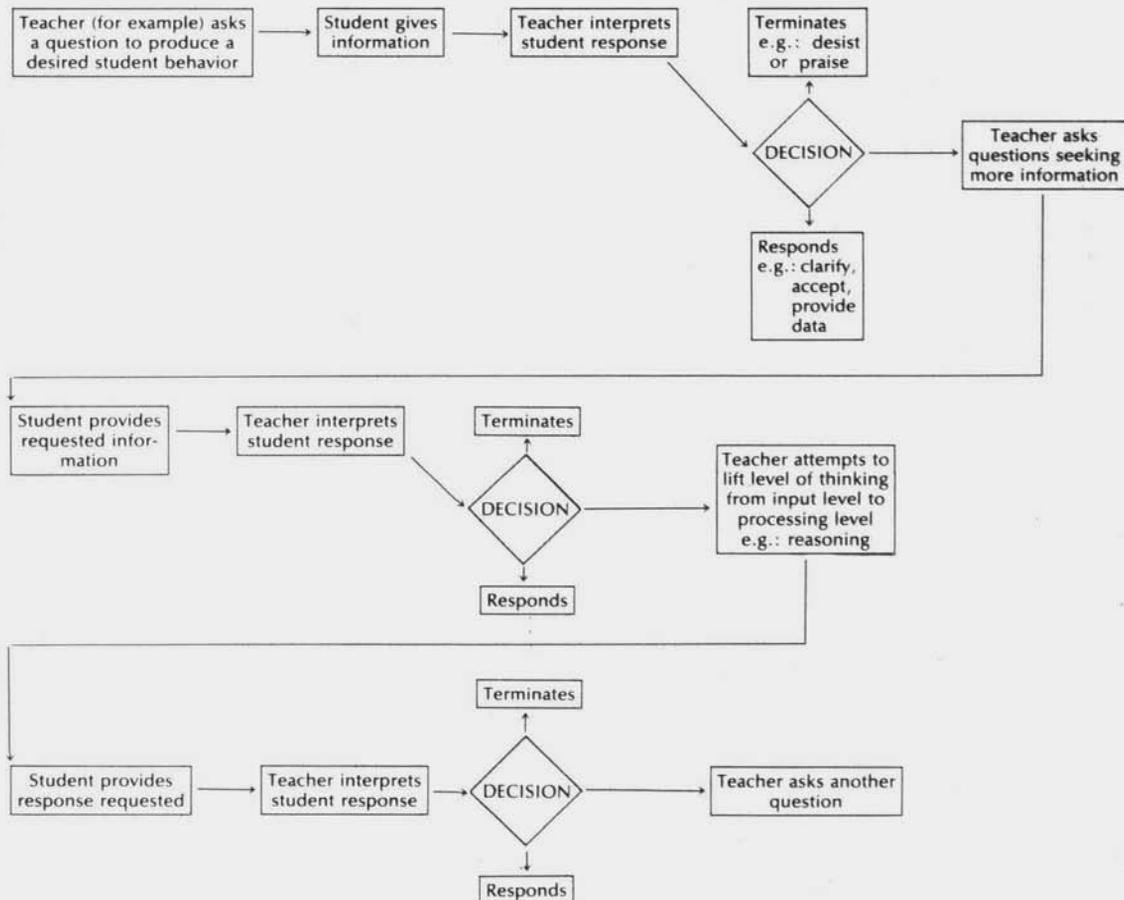
considered? When is there an adequate data base on which to predict successful thinking if a higher level question were to be asked? For example, at the beginning of a lesson it may be best to structure the task and motivate students to become curious, involved, and focused. Later the teacher might need to use recall questions to have students review previously learned information and to gather data to be considered later. Still later, the

teacher might invite higher level thinking (Doyle, 1979).

During the interactive stage, the teacher constantly questions, probes, observes, and interprets student behaviors and decides whether to move ahead in the sequence or remain at the present step (Figure 4).

Thus, the teacher may ask a question to elicit diagnostic information about a student. The teacher then analyzes that information and decides

**Figure 4. Interactive Teaching Decision-Making Flow Chart.**



Adapted from Marland, 1982.



Daniel Jervis

**“Autonomous teachers reflect upon, conceptualize, accumulate, and apply understandings from one classroom experience to the next.”**

what to do next: should the student's response be praised, extinguished, clarified, or extended?

Superior teachers not only know how to ask a range of questions; they also know *when* to ask them. They know how to select from a repertoire of teaching strategies and to predict outcomes. Keeping a strategy in mind helps in making these decisions. Without a strategy, classroom interaction is unfocused, random, and chaotic.

Teaching strategies also provide a screening mechanism by which teachers can select relevant and often subtle cues out of the myriad signals students send. To manage the continual flow of events, teachers must constantly monitor the classroom environment and be alert to student cues. Cues, such as on-task behavior and student success, provide an information feedback system on which decisions are based (Rohrkemper, 1982; Berliner, 1982).

Because students constantly send out information about themselves, the teacher's conscious processing of this information can only be directed to a selected number of task-relevant cues. With a teaching strategy in mind, task-relevant cues are noticed more rapidly, and irrelevant cues are discarded (Berliner, 1982; Kounin, 1970). After seeing or hearing a particular student behavior, the teacher interprets the cue by either assigning a meaning for it from memory or constructing a new meaning. The teacher can then either design or call from past experience the most appropriate behavior to use to respond. Although teachers possess impressive amounts of data and perceptions about students, they seldom verify the accuracy of their interpretations about students' cognitive and affective states. The validity of their interpretations and their choices of subsequent behavior, therefore, might be questionable (Marland, 1982).

Superior teachers appear to control their emotional, impulsive reactions to events (Doyle, 1979). Classroom cues received through the unconscious can build up over time and disrupt conscious information processing. Restraining impulsive or emotional reactions to such cues is necessary for the teacher to reserve capacity for imme-

diate classroom decisions. This restraint also provides students with a model of how to deal with similar problems in and out of school, now and in the future (Calfee, 1981; Feuerstein, 1980).

Routines and management systems are especially helpful in dealing with the information processing demands of the immediacy, spontaneity, and unpredictability of classrooms. Routines reduce the need to attend to the

abundance of simultaneous cues from students. Teachers who have established automatic routines can attend to cues that signal discrepancies and abnormalities rather than dealing with all student behaviors all the time

## Some Indicators of Teacher's Intellectual Autonomy

I. PLANNING (The Preactive Phase)	Performed autonomously by teacher	Performed only when invited by supervisor	Must be performed by supervisor
<ol style="list-style-type: none"> <li>1. States relationship between this lesson and larger, long-range goal.</li> <li>2. Provides descriptions of student learnings that will result from this instruction.</li> <li>3. Envisions, describes an instructional strategy:               <ul style="list-style-type: none"> <li>_____ Content</li> <li>_____ Time sequencing</li> <li>_____ Group/structuring</li> <li>_____ Sequence of learning activities</li> <li>_____ Repertoire of teaching behaviors</li> </ul> </li> <li>4. Identifies data about students: previous learnings/entry/capabilities, and so on.</li> <li>5. Anticipates a method of evaluating outcomes.</li> </ol>			
<b>II. TEACHING (The Interactive Phase)</b>	High degree—as evidenced by:	Somewhat—as evidenced by:	Low degree—as evidenced by:
<ol style="list-style-type: none"> <li>1. Deals with multiple activities (classification systems) simultaneously.</li> <li>2. Uses clear and precise language.</li> <li>3. Remembers strategy.</li> <li>4. Monitors own progress along that strategy (meta-cognition).</li> <li>5. Restrains impulsivity (ignoring selected behaviors, accepting).</li> <li>6. Is conscious of and sensitive to behavioral cues coming from students (monitoring).</li> <li>7. Alters teaching strategy based on cues coming from students (repertoire).</li> <li>8. Routinizes classroom management tasks.</li> </ol>			
<b>III. ANALYZING AND EVALUATING (The Reflective Phase)</b>	Performed autonomously by teacher	Performed only when invited by supervisor	Must be performed by supervisor
<ol style="list-style-type: none"> <li>1. Recalls data about student and teacher behavior from teaching experience.</li> <li>2. Makes comparison between intended and actual outcomes.</li> <li>3. Makes causal relationships as to why objectives were/were not achieved.</li> <li>4. Self-evaluates own actions of planning, teaching phases (auto-criticism).</li> <li>5. Displays internal locus of control.</li> </ol>			
<b>IV. APPLYING (The Projective Phase)</b>			
<ol style="list-style-type: none"> <li>1. Predicts or hypothesizes differences in learning outcomes if alternative strategies were to be used.</li> <li>2. Plans future lesson strategies based upon principles abstracted from the analysis of previous lessons.</li> <li>3. Makes a commitment to alter/experiment with own behaviors.</li> </ol>			

(Doyle, 1979). Superior teachers develop routine systems for dealing with many classroom management func-

tions (taking roll, distributing papers and books, forming groups) as well as having systematic lesson designs

(spelling, math drills) and teaching strategies (questioning sequences, structuring) (Kounin, 1970).

## Objectives of the Supervisory Conference

<i>Supervisor Objectives</i>		<i>Teacher Objectives</i>
<p><b>Pre-observation.</b></p> <ol style="list-style-type: none"> <li>1. Elicit and clarify statements of purpose of the lesson (unit, episode, year, individual).</li> <li>2. Probe for specific observable student behaviors.</li> <li>3. Probe for the specific teaching strategies/behaviors to be used.</li> <li>4. Determine what led up to and what will follow this lesson.</li> <li>5. Invite teacher concerns/hopes for the lesson.</li> <li>6. Elicit a description of own role in the observation.</li> </ol>	<b>AUDITING</b>	<p><b>Pre-observation.</b></p> <ol style="list-style-type: none"> <li>1. State the purposes of the lesson.</li> <li>2. Translate the purposes into descriptions of observable student behaviors desired.</li> <li>3. Describe the teaching strategies/behaviors to be employed to facilitate students' performance of desired behaviors.</li> <li>4. Describe the sequence in which this lesson occurs.</li> <li>5. Anticipate any concerns.</li> <li>6. Describe the role of the observer.</li> </ol>
<p><b>During the lesson.</b></p> <ol style="list-style-type: none"> <li>1. Observe and record teacher behaviors.</li> <li>2. Observe and record student behaviors.</li> </ol>	<b>MONITORING</b>	<p><b>During the lesson.</b></p> <ol style="list-style-type: none"> <li>1. Utilize the anticipated teaching behaviors/strategies.</li> </ol>
<p><b>Post-observation.</b></p> <ol style="list-style-type: none"> <li>1. Probe for the teacher's intuition/feelings/affect.</li> <li>2. Ask the teacher to recall the student behavior observed during the lesson to support those feelings.</li> <li>3. Ask the teacher to recall the teacher behaviors/strategies used during the lesson.</li> <li>4. Present the teacher with data collected about student behaviors and seek comparison between student behavior performed and student behavior desired.</li> <li>5. Present the teacher with the data collected about teacher behaviors and seek comparison between teacher behavior performed and teacher behavior planned.</li> <li>6. Probe for inferences about the achievement of the lesson's purpose.</li> <li>7. Probe for explanations as to why the student behaviors were/were not performed.</li> </ol>	<b>VALIDATING</b>	<p><b>Post-observation.</b></p> <ol style="list-style-type: none"> <li>1. Express feelings about the lesson.</li> <li>2. Recall student behaviors observed during the teaching to support feelings.</li> <li>3. Recall own behavior during the lesson.</li> <li>4. Compare student behavior performed with student behavior desired.</li> <li>5. Compare teacher behavior performed with teacher behavior planned.</li> <li>6. Make inferences as to the achievement of the purposes of the lesson.</li> <li>7. Analyze why the behaviors were/were not performed.</li> </ol>
<ol style="list-style-type: none"> <li>8. Elicit prescriptions for alternative teaching strategies/behaviors/conditions.</li> <li>9. Elicit an evaluation of the interview process and supervisor's conference skills.</li> </ol>	<b>CONSULTING</b>	<ol style="list-style-type: none"> <li>8. Prescribe what will/might be done differently in the future.</li> <li>9. Express feelings about the value of the interview.</li> </ol>

## Analyzing and Evaluating— The Reflective Stage

*Analyzing and evaluating* consists of the mental processes used to reflect upon, analyze, and judge teaching acts performed in the immediate past. Analyzing involves collecting and using understandings derived from comparison between actual and intended outcomes of teaching. If there is great similarity between behaviors predicted during the planning stage and those observed during the interactive stage, then there is a match, and no discrepancy exists—*assimilation*. If, on the other hand, there is a mismatch between student behaviors observed and student behaviors intended, a discrepancy exists that must be resolved or explained—*accommodation*. Reasons are given to explain this discrepancy, and cause-and-effect relationships are drawn between instructional conditions and behavioral outcomes (Barr and Brown, 1971; Rohrkemper, 1982).

Evaluating involves judging the worth of decisions made during the planning and interactive phases (Shavelson, 1976). During evaluation, some value is placed on the quality of the teacher's thinking both before and during teaching. This uniquely human intellectual capacity to self-evaluate is what Binet called *auto-criticism* (Whimbey and Whimbey, 1976). It is our ability to stand apart from, contemplate, and evaluate our own actions. It requires a conscious awareness of self-interaction with the real world. Autonomous teachers are aware of their own thinking while they are deciding—*introspection*—and can reflect upon their thinking after they have made a decision—*retrospection* (Clark and Yinger, 1979).

Autonomous teachers have an internal rather than an external locus of control. It is one thing for a supervisor to judge the learning outcomes of a teacher's lesson, but what about teachers' estimates of their own success? (Harootian and Yarger, 1981).

Teachers may dismiss or distort information that indicates students did not learn as a result of the teaching strategy. They may not be entirely rational when faced with the possibility that the lesson did not produce desired results; they may be more concerned about maintaining a consistent self-image. Teachers often give themselves credit when there is student improvement but place blame elsewhere when performance is inadequate (Harvey, Kelly, and Shapiro, 1957). Classroom observers, however, are much less likely to attribute improvement to the teacher and more likely to attribute decreases to the teacher and to student motivation (Shavelson, 1976).

Teachers who are insecure or who have low self-esteem may allow biases to enter their interpretations. Teachers who have a positive self-image are more likely to hold themselves responsible for the outcomes of teaching—whether positive or negative (Rohrkemper, 1982; Harvey, Kelly, and Shapiro, 1957).

## Applying—The Projective Stage

*Applying* involves learning from experience. As a result of the evaluation and analysis phase, teachers make commitments regarding their future actions. This stage involves abstracting generalizations from experiences and carrying forth those generalizations to future situations. Knowing when to decide is a cognitive skill that results from experience. Experience, however, is not enough. Experiences must be compared, differentiated, categorized, and labeled. Such a system allows the teacher to recognize and interpret classroom events, departures from routines, and novel occurrences. Thus, the teacher can predict the consequences of possible alternatives and directions of activities. Without the conceptual system, the classroom remains a mass of chaos and confusion. Since this knowledge comes through experience, it explains why the demands on inexperienced teachers are so intense; their knowledge is being tested and constructed at the same time (Doyle, 1979).

## Some Components of the Supervision Process

1. AUDITING (Planning/Preactive phase)
  - Clarifying goals and objectives
  - Describing teaching strategies
  - Determining evaluation measures and techniques
  - Clarifying the evaluation process
2. MONITORING (Teaching/Interactive phase)
  - Gathering data about student performance of objectives
  - Gathering data about teacher performance of strategies
3. VALIDATING (Analysis and Evaluation/Reflective phase)
  - Sharing data collected about student and teacher performance
  - Comparing what actually happened with what was desired
  - Making inferences about student achievement of objectives
  - Making inferences about teacher performance
  - Drawing cause-and-effect relationships between teacher performance and student achievement
4. CONSULTING (Application/Projective phase)
  - Evaluating appropriateness of desired objectives
  - Prescribing alternative teaching strategies
  - Developing insight into the supervisory process
  - Evaluating the process of supervision

Calfee (1981) suggests that much of what we do comes about by reflecting on alternative courses of action, is rooted in analysis of previous experiences, supported by language and capacity for symbol use, guided by the counsel of others, and subject to continuous revision as circumstances dictate.

Autonomous teachers reflect upon, conceptualize, accumulate, and apply understandings from one classroom experience to the next. As concepts about teaching accumulate, teachers become more routinized, particularized, predictable, and refined (Ryan, 1979). The concepts and relationships derived from the analysis and evaluation stage are extrapolated in making future decisions in planning and interactive teaching. During this application stage, teachers formulate hypothetical statements or future plans. Hypotheses might be characterized by "iffy" thinking: "If I were to do this lesson again, I would..." Future-oriented thinking might include such statements as, "From now on I'm going to..." or "Next time I'll plan to..."

Autonomous teachers spontaneously make commitments to change their behaviors and strategies based on self-analysis. This step closes the instructional cycle because it serves as a basis for future planning in the first stage.

### Focusing on Teachers' Inner Thinking

These are many, but certainly not all, of the cognitive processes involved in these four components of teaching. This research supports the assertion that supervision should emphasize not only the overt behaviors of teaching but the inner thinking processes as well. Such a focus on enhancing teachers' cognitive abilities will, in turn, increase student learning. □

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