

# TEACHERS AS MANAGERS OR DECISION MAKERS? TECHNOLOGY VERSUS DELIBERATION IN TEACHING

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Technological and deliberative orientations to teaching, along with their impact on the teaching of reading should be given attention by personnel in reading. In addition to comparing both approaches, arguments can be examined regarding when teacher preparation and professional development should be driven by these orientations.

The research base on teacher education can be interpreted as providing two polar orientations toward teaching: technological and deliberative (Zumwalt, 1982). The technological orientation, grounded in early behaviorism, describes effective teaching in terms of behaviors (procedures and routines) that produce desired educational outcomes, often narrowly defined as increased achievement test scores. Effective teaching behaviors can be derived from the process-product research conducted over the last decade. Presumably, improvement in teaching is attained by training teachers in executing the behaviors demonstrated by their effective colleagues.

In contrast, the deliberative orientation, underpinned by cognitive psychology, views teaching as a rational activity that requires knowing, thinking, planning, and problem solving in a setting that is in a constant state of flux. Improvement in teaching is achieved by helping teachers develop the knowledge structures necessary for solving practical problems related to instruction, as opposed to training them in the "moves" of teaching.

It is possible to demonstrate that both orientations have a role in the preparation and on-going education of teachers. However, concern exists that many states, including North and South Carolina, Virginia, Tennessee, Texas, and Florida, have adopted educational reform programs based solely on the technological orientation. After examining the content and initial implementation efforts of these programs, one might conclude that little positive impact can be expected. In fact, there is a real danger that these programs will institutionalize many questionable teaching practices based on a simplistic recipe model.

At the root of the problem is the use of achievement test scores as the sole outcome measure of effective teaching. Because this outcome is correlated to the teaching behaviors described as effective, it is assumed that a cause-effect relationship exists. Ignored is the reality that achievement tests are designed to use a power testing approach to sort students, not to test the effects of instruction. Furthermore, since the product is achievement test score gain, processes that have no clear correlation to these outcomes seem to be ignored. Thus, characteristics such as knowledge of subject matter, enthusiasm for teaching, and affective behavior are not included in the operational description of the effective teacher. While the scientific aspects of teaching are extolled, the artistic elements are ignored.

## Technological Versus Deliberative models of teaching

Each orientation to teaching is buttressed by very different assumptions about teaching; Figure 1 organizes and contrasts these assumptions.

The first set of assumptions that delineates these two orientations to teaching involves the role that the knowledge base in education plays in instruction. From the technological perspective, knowledge is prescriptive: Research results provide scripts to be followed by teachers. From the deliberative perspective, knowledge provides the grounds for making instructional decisions. Teachers use knowledge to guide instruction, accessing relevant cognitive structures based on classroom cues.

Assumptions about knowledge are closely related to assumptions about the classroom setting. The technological orientation regards the context of instruction as stable. Instructional problems are essentially identical across classrooms. They can be identified with precision in advance, and require only the implementation of an existing prescription. In contrast, the deliberative orientation views the classroom as unique and complex. Instructional problems can often, but not always, be anticipated, and require variable and often transient solutions.

These views of knowledge and the classroom setting dictate the role of the teacher. The technological viewpoint places teachers in the role of maintaining an appropriate classroom management situation which is necessary for the proper execution of pre-determined teaching scripts. From the deliberative perspective, the teacher must assume the role of decision maker, choosing from alternative courses of action based on a personal interpretation of the classroom context and the relevant knowledge base. Thus, the technological teacher is tied to prescribed routines, while the deliberative teacher uses meaningful routines, making appropriate adjustments in instruction according to the context.

In the technological orientation, the locus of control is outside the classroom. Teachers are expected to implement the instructional decisions of authorities, such as authors of instructional materials, state departments of education, curriculum coordinators, principals, university professors, consultants and assorted other experts. In the deliberative orientation, the teacher remains in control, taking into consideration the opinions of authorities, but maintaining final decision-making authority.

It follows from the technological orientation that the breadth and depth of teachers' knowledge about curriculum, scope and sequence of instruc-

**Figure 1**  
**Assumptions underlying two orientations to teaching**

	<u>Technological</u>	<u>Deliberative</u>
Knowledge base on education	Prescriptive	Grounds for decision making
Classroom setting	Stable, predicatable	Unique, complex
Role of Teacher	Manager who executes scripts	Decision maker who interprets and implements
Locus of control	Authority outside the classroom	Teacher
Teachers' knowledge	How to implement pre-existing curricula and materials	How to anticipate instructional problems, modify curricula and materials
Innovations for practice	Adopt	Adapt
Organizational model	Top-down	Bottom-up

tional programs, and the quality of educational materials are less essential. It is important to know how pre-packaged curricula and commercial materials are organized and utilized, but knowledge to initiate differential use becomes unimportant. In the deliberative orientation, teachers must also know how curricula and materials are organized and used. Further, they must be able to recognize if instruction is unlikely to facilitate learning for a given student or group of students, and develop instructional alternatives accordingly.

In summary, innovations for practice in the technological orientation are adopted by the teachers at the directions of others, while in the deliberative orientation, innovations are adapted to existing contexts at the discretion of the teacher. The power to make instructional decisions in the technological model lies at the top of the organizational hierarchy. It is best viewed as a top-down organizational model. In the deliberative orientation, the decision making power rests with the teacher, within parameters dictated by the educational knowledge base. This is described as a bottom-up organizational model.

An important question thus becomes "Who ought to be empowered to make instructional decisions?" The answer must be based on who is most likely to make the best decisions for students. This would vary, with the most important factor being the experience and expertise of the teacher. Inexperienced or poorly prepared teachers should not be placed in positions of authority. From one possible perspective, teacher preparation content could largely be derived from the technological orientation. Prospective teachers should be required to demonstrate the basic skills and behaviors drawn from the technological orientation. Technological knowledge, then, is desirable for initial teacher education and certification, as well as for forming essential knowledge structures critical to deliberative teaching.

The content for professional development after initial certification should stem primarily from the deliberative orientation. Knowledge of this kind would establish criteria for points along career ladders and provide the structure for ongoing supervision and inservice education. Thus, skillful teachers could identify precisely how to improve their teaching.

## The Current Dilemma

When a single orientation, the technological one, is used as the basis for most major personnel decisions, the whole opportunity for professional diversity narrows. A truncated view of effective teaching, designed to describe some teacher behaviors, is often used as the base for teacher evaluation instruments. This same orientation may also be adopted as basis for criteria to describe effective student teaching. It then is used to describe expectations for teacher movement on career ladders, and finally, as a benchmark for awarding merit pay or other performance incentives. All this has the effect of making the technological view of teaching the only acceptable one, leaving the deliberative orientation as a disincentive to practice. A single interpretation of knowledge is dangerous for education.

To illustrate the dilemma, one can examine an issue where the technological and deliberative orientations are clearly at odds: the current research base on questioning. Effective teaching research (and hence the technological viewpoint) suggests that teachers ask questions at a brisk pace, with a high rate of student success. It is also suggested that most questions should be at the literal level of comprehension. Ignored is the fact that a decision to use questioning as an instructional strategy is complex and requires more information than the procedural knowledge of a simplistic cybernetic-like routing. And yet, little treatment of levels of questioning appears in the literature on the use of questions for effective teaching. Obviously, higher-order cognitive questions are not amenable to a brisk pace with a high rate of success.

The research literature provides incomplete and even contradictory answers to important concerns about the use of questions. Do the instructional effects of questions vary with age? Most of the research on questioning has been conducted with older students, making generalizations to other populations difficult. Should questions be written or oral? Most of the research has investigated the use of written questions presented before, after, or interspersed in textual material. Results from this body of research are often, and incorrectly, applied to lectures, recitations, and discussions. At what point in a lesson should questions be used? The answer depends on what research one reads; the effects of questioning seem to vary with the kind of question asked, subject matter and expected learning out-

comes. If this state of the art on using questioning as an instructional tool is not confusing enough, some authors like to point out that a coherent (and research based) argument can be made for limiting and even eliminating questioning (Dillon, 1978).

Recent research (Collins & Stevens, 1983) on using questioning/discussion as a teaching strategy reveals that expert teachers use questions differently, depending on goals and content area. At least seven goals can be identified when questions are used to probe students in order to get them to develop or use higher order thinking skills in processing information: form hypotheses, test hypotheses, make predications, consider alternative predictions, reveal misconceptions, trace consequences to contradictions, and formulate alternative hypotheses. Expert teachers also use rather sophisticated strategies in the selection of cases and exemplars to engage students in thinking about the relevant and irrelevant aspects of problems and content.

An additional problem involved in the use of questions involves the appropriate length of time a teacher should wait for an answer. Research has demonstrated that when teachers provide students with wait-time, there is a qualitative increase in students' cognitive processing of information. But this is only part of the research results. On the one hand, the preponderance of evidence reveals that teachers can be helped to provide wait-time for students. On the other, the evidence reveals that the effects of training teachers in providing wait-time quickly diminishes and teachers revert back to their regular questioning routines.

There are explanations for these results. Kounin (1970) argues that teachers avoid breaks in the flow of instruction. Observations reveal that breaks in instruction are the most opportune time for pupil behavior problems to arise. Studies of interactive teaching also reveal that teachers avoid pauses and breaks that have high probability of interrupting critical moments in teaching. Thus the practical knowledge acquired by teachers on the job seems to suggest to them that wait-time creates problems. As a result, even after being trained to provide wait-time, they soon fall back on their previously acquired questioning routines in order to avoid disruptions in the flow of instruction.

Finally, a review of teacher evaluation procedures provided by many "effective teacher train-

ing" programs reveals that teacher questioning is the only instructional strategy identified for observation. Needless to say, the inference to be made by both teachers and evaluators is that questions should be used as a predominant form of instruction. This is most unfortunate, given the wide variety of tested instructional strategies developed over the last two decades.

There is insufficient evidence for confidently suggesting to teachers that asking students questions at a brisk pace is a benchmark of effective instruction. In more cases than not, this advice results in teachers becoming interrogators of students. Students learn little more than the idea that school and learning are nothing more than exchanging correct answers for grades.

Such a simplified treatment of questioning as an instructional routine represents merely a minimal level of professional performance. Once this basic knowledge has been established, teachers should be assisted in developing a more robust understanding of the complexity of questioning strategies. Both positive and negative effects of questioning should be recognized. Questions can provide opportunities to model scientific thinking, motivate students, and individualize discussion. In contrast, questions can provide negative reinforcement, reveal the ignorance of some students, turn a discussion into an interrogation, and exclude some (if not most) of the students from participation. To question successfully, the teacher must know subject matter well, be able to handle novel situations as they occur during interaction, and select and pose questions accordingly. Such teaching skills transcend the limits of the technological orientation, and require the implementation of a deliberative model.

### **Implications for Teacher Education**

Teacher education should help teachers make the transitions from the role prescribed by the technological model to the more demanding and productive role implied by the deliberative model. This will require a change in some current conceptualization of preservice and inservice education. It is important to move from a model of "teacher training" toward models that develop the intellect of teachers. In initial teacher education, this implies that teachers should be provided with the knowledge structures and attitudes necessary for developing a "strong schema" (Anderson, 1984) for teaching. There are at least six preconditions to such a change.

First, there is a clear need to explore and more clearly define the knowledge base of teaching. Such a base should include the knowledge, skills, rules, definitions, strategies, ethics, and so forth that experts use to perform in a given context. The current work of Berliner (1986), Duffy (Punam & Duffy, 1985), and Leinhardt (Leinhardt, 1983; Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985) are examples of the kinds of research and theoretical work that need to be expanded in this area.

Second, and clearly related, is the need for a change in perception of the role of knowledge, particularly research knowledge, in educational practice. Knowledge cannot be prescriptive, if the educational context is as complex as current thinking indicates. Educators at all levels must come to view knowledge as providing the grounds for decision making. The expert teacher must be able to access from knowledge structures that contain information relevant to a specific instructional moment. Thus, knowledge should be used to identify problems, create solutions and guide instruction. From this perspective, the teacher becomes a manager of ideas.

Next, the focus of preservice teacher education needs to shift away from telling prospective teachers what to do toward helping them **think** about what to do. Current teacher education programs predominantly use the metaphor of the mind as a sponge. Information should be absorbed. A more facilitative metaphor is the mind as transformer and transducer. Information is restructured and brought to bear on relevant situations. This implies the use of case study approaches. Students are initially provided with educational problems and guided in locating relevant knowledge in order to solve them. This process would incorporate such skills as reading the professional literature, discussion, problem solving, and reflecting with peers, consultations with experts (university faculty and others), and related problem solving strategies. During practicums and student teachings, students would be expected to identify problem cases, solve them and reflect on pertinent experiences.

Similarly, the continuing education of teachers must be reconceptualized. Current notions of "inservice" are tied to the technological model, and hence limiting in the development of teacher expertise. Bringing in consultants for one shot "dog and pony shows" has limited benefit. A stronger method is already at least partially in place; this is

the use of conferences where teachers select from a menu of informational presentations. Conferences provide the opportunity for teachers to seek out information that can enrich their current understanding, and the knowledge necessary for putting them in cognitive control of their teaching.

Fifth, more needs to be known about "meaningful routines." The literature on effective teaching makes it clear that routines are critical to effective teaching. Evidently, routines free teachers to attend to the classroom contexts for cues on how to proceed with instruction. More needs to be known about the relationship of this procedural knowledge to the knowledge of content, pedagogy, and educational theory (Blanton & Moorman, 1987). Expert teachers are capable of accessing appropriate knowledge within the structure provided by instructional routine. How is this skill acquired?

Finally, it is crucial for teachers to be empowered and enabled. Current professional treatment of teachers often is professionally unacceptable. Every effort must be made to professionalize the conditions under which teachers work. The notion of "faculty governance," long the cornerstone of universities in Western culture, should be applied to schools at every level. Let administrators assume the role of freeing teachers to teach. And let teachers assume the role of making responsible instructional decisions. Teachers should lead the way by becoming more conscientious and professional in their performance, while simultaneously demanding the respect and consideration they deserve.

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