Five Faces of Research on Teaching

Christopher M. Clark

Researchers use five different approaches as they try to learn more about what makes a good teacher.

"What makes a good teacher?" is a question that fascinates parents, educators, and behavioral scientists. Several variations of this question occur in the literature of research on teaching and teacher effectiveness. Behaviorists ask which teacher behaviors are systematically and causally related to student achievement. Cognitive psychologists study the mental processes thought to guide and determine teacher behavior. Aptitude treatment interaction researchers ask what types of instructional treatment are most effective with different types of students. And ethnographers describe and interpret life in classrooms in terms of the social context.

In any field of inquiry, the answers we develop are shaped by the form of the questions we ask and the methods we use to resolve them. Research on teaching is no exception. To oversimplify a bit, I see five approaches to research on teaching that can be grouped into two broad categories: primarily quantitative approaches and primarily qualitative approaches.

The quantitative approaches are the Process-Product Approach, the Aptitude-Treatment-Interaction Approach, and the Carroll Model Approach. The qualitative approaches are the Ethnographic Approach and the Cognitive Information-Processing Approach.

Quantitative Approaches

The three quantitative approaches to research on teaching share several goals and assumptions. First, the object of the research is to discover laws or law-like statements about the relationship between teacher behavior and student achievement. These laws are expected to be applicable over a wide range of circumstances, that is, the search is for general laws. Second, there is an emphasis on observable behavior, particularly that of the teacher. Third, researchers analyze the act of teaching into many component parts or variables, with examination of only a few of these variables in any single study. Finally, the generally accepted criterion of excellence for research findings is the replication of those findings in subsequent studies.

The Process-Product Approach differs from the other quantitative methods in that research questions are more concerned with the
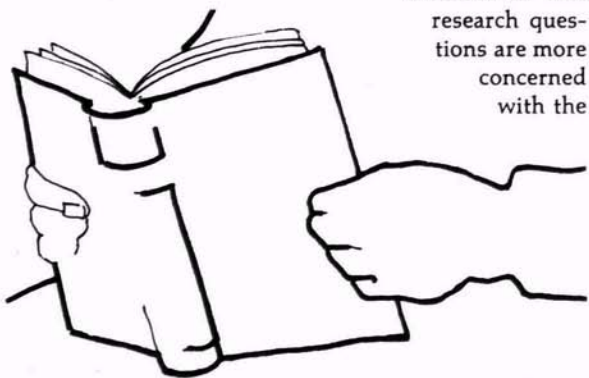
average amount of learning or achievement accomplished by a group than with measuring, predicting, or explaining individual differences in learning due to teacher behavior. Researchers in this tradition are more interested in what teachers and students have in common than how they are different.

A typical process-product study consists of operationally defining a teacher behavior variable (such as teacher praise) or set of variables, counting the frequency with which that behavior occurs in many classrooms for a fixed period of time, and statistically correlating the frequency of teacher behavior with average student achievement scores measured at the end of the observation period. A statistically significant positive correlation between, say, teacher praise and reading achievement, would suggest that the more

effective teachers use more praise. Experimental designs have also been used in which the teacher behavior of interest is controlled at specified levels rather than allowing it to vary naturally. From such experimental studies it is possible to draw strong inferences about the cause-effect relationship between teacher behavior and student achievement.[1]

Researchers who use the Aptitude-Treatment-Interaction (ATI)[2] or the Carroll Model Approach[3] are concerned with adapting teaching to individual differences in students, but in distinctly different ways. ATI researchers believe that their research will identify instructional methods (treatments) that are particularly suitable for students who have specific personal characteristics (aptitudes). The guiding question for ATI research is, "Which teaching method is best for which kinds of students?" In contrast, researchers in the Carroll Model tradition believe that the single most important factor in explaining, predicting, and controlling student achievement is *time* for learning. Therefore, this kind of research primarily investigates ways for teachers to optimize the amount of time that each student spends on each learning task, with the goal of maximizing achievement for all students. Implicit in the Carroll Model Approach is that the effects of student aptitudes of interest to ATI researchers can be wiped out by the powerful treatment of differential, individualized learning time.

We have learned a great deal from primarily quantitative research on teaching in its various forms. Process-Product, ATI, and Carroll Model researchers have described classroom interaction systematically and in great detail. We have seen the great natural variation in what teachers do and, especially through training experiments, have learned a great deal about how to change and shape teacher behavior. But mul-

[1] For a comprehensive review of process-product research on teaching, see: Michael J. Dunkin and Bruce J. Biddle. *The Study of Teaching.* New York: Holt, Rinehart and Winston, 1974.

[2] Aptitude treatment interaction research is reviewed in: Lee J. Cronbach and Richard E. Snow. *Aptitudes and Instructional Methods.* New York: Irvington Publishers, 1977; and also in: Richard E. Snow. "Learning and Individual Differences." In: Lee S. Shulman, editor. *Review of Research in Education* Vol. 4: Itasca, Illinois: F. E. Peacock, 1976.

[3] John B. Carroll. "A Model of School Learning." *Teachers College Record* 64:723-33; 1963. In his seminal paper, Carroll proposed that school learning can be accounted for in terms of five factors, all of which are expressed in units of time. More recent research and development in this tradition include the work of Benjamin S. Bloom and his colleagues on mastery learning, David Wiley and Annegret Harnischfeger's policy research on length of the school day and school year, and the work of the staff of the Far West Laboratory for Educational Research and Development Beginning Teacher Evaluation Study.

tiple studies of a few teacher behavior variables have turned up inconsistent results, and no general laws of the sort once hoped for have emerged from this body of work.

In the face of this situation, many quantitatively-oriented researchers remain undiscouraged. Attempts have been made to re-interpret this body of literature using statistical techniques such as a meta-analysis[4] in which the results of many different studies of ostensibly the same variables are combined to permit more general and global conclusions than are possible from a few studies. Others advocate greater sophistication in classroom observation instruments including the tracking of individual students in their interaction with teachers.[5] Still others suggest that experimental rather than correlational research will sort out the causal links between teacher behavior and student achievement.[6] The quantitative research going on today is an order of magnitude more sophisticated than studies conducted five or ten years ago.

Qualitative Approaches

Other researchers on teaching have responded to the disappointments of primarily quantitative research in a different way. Rather than asking "What works?" or "What works with whom?" this new school of thought asks "What is happening here and why?" The main goal of this kind of inquiry is understanding the reasons why teaching is as it is. This primarily qualitative research comprises the Ethnographic Approach[7] and the Cognitive Information-Processing Approach[8] to research on teaching.

Like the primarily quantitative paradigms, these two approaches share some assumptions and values. Teacher and students are seen as purposive agents whose thoughts, plans, perceptions, and intentions influence their behavior and moderate the effects of behavior. The social context in which teaching and learning take place is considered an important source of explanation for classroom phenomena. Much of this research is descriptive rather than prescriptive, and the description depends, in part, on teachers' and students' reports of their thinking, reasoning, and understanding of a given situation.

The Ethnographic and Cognitive Information-Processing Approaches differ in their disciplinary heritage and in some of their methods of inquiry. Ethnography has its roots in anthropology and was developed and used to study cultures, particularly foreign cultures. The methods of participant observation, field work, use of informants, and derivation of hypotheses from analysis of field notes have been refined and modified to fit the more familiar context of American schools. The ethnographer is committed

to studying a whole social system by portraying it in terms credible to and understandable by participants in that system. Indeed, major questions in most ethnographic studies have to do with locating the boundaries of the "whole" and identifyng the web of meaning shared by teachers and students.

In the Cognitive Information-Processing Approach, there is a great deal of interest in basic psychological processes thought to occur in the mind of the teacher that organize and direct his or her behavior. The implied model of teaching is that the teacher is a rational and intelligent individual faced with a very complex situation. The way that a teacher or any other rational agent deals with complexity is to simplify it in some rational and adaptive way. In the language of cognitive psychology, the teacher enters a complex task environment and simplifies it by defining some small part of it as the problem space within which
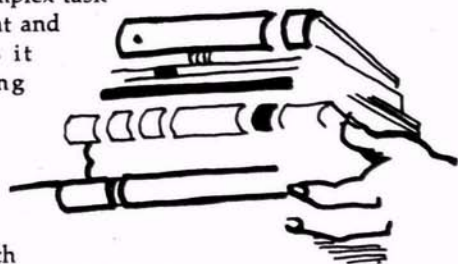
he or she will work. The basic psychological processes that affect how a teacher simplifies a task environment include judgment, decision making, attention, and short-term and long-term memory. Most of these basic processes have been investigated in the psychology laboratory, but none have been thoroughly studied in realistic and complex educational settings.

Basic psychological processes like teacher judgment and decision making do not operate in a vacuum. Researchers using the Cognitive Information-Processing Approach must attend to the psychological and ecological context in which basic processes are embedded. The psychological context for teacher judgment and decision making is made up of the teacher's implicit theories or beliefs and values about

[4] Gene V Glass. "Primary, Secondary, and Meta-Analysis of Research." *Educational Researcher* 5(10): 3-8; November 1976; Penelope L. Peterson. "Direct Instruction Reconsidered." In: Penelope L. Peterson and Herbert J. Walberg, editors. *Research on Teaching.* Berkeley, California: McCutchan, 1979.

[5] Jere E. Brophy and Thomas L. Good. *Teacher-Student Relationships.* New York: Holt, Rinehart and Winston, 1974.

[6] Nathaniel L. Gage. *The Scientific Basis of the Art of Teaching.* New York: Teachers College Press, 1978.

[7] A special issue of *Anthropology and Education Quarterly* 8(2); May 1977, is devoted to exploring qualitative/quantitative research methodologies in education.

[8] For a review, see: Christopher M. Clark and Robert J. Yinger. "Research on Teacher Thinking." *Curriculum Inquiry* 7(4): 279-304; Winter 1977.

sites. For example, in research on teacher planning[11] it seems more profitable to work with teachers as they plan for the teaching of creative writing than to study planning for reading or mathematics instruction. Reading and mathematics curricula are largely prescribed and embodied in commercially-produced materials and learning systems. Teacher planning is largely taken care of by the publishers and authors of these systems. In contrast, very little curriculum material is available to support the teaching of writing. In such an open situation, researchers have an opportunity to learn about a wide range of teacher cognitive behavior as he or she plans, elaborates ideas, tries them out mentally, implements activities in the classroom, and revises, rejects, or transforms the activities into routines. Teacher tasks that are not severely constrained by habit or prescribed materials and procedures provide the most promising opportunities for the Cognitive Information-Processing Approach.

My identification of five approaches to research on teaching is somewhat arbitrary and personal and you may come up with a sixth or seventh approach or combine two or three of mine into a single approach. My purpose is to communicate the way that I categorize approaches to analysis of teaching in the hope that the concepts, distinctions, and methods of analysis will be helpful to you as you seek answers to theoretical and practical concerns. Educational research and practice cannot help but profit from a multiplicity of recognized and complementary ways of studying teaching.

[9] Philip W. Jackson. *Life in Classrooms.* New York: Holt, Rinehart and Winston, 1968.

[10] For example: Penelope L. Peterson and Christopher M. Clark. "Teachers' Reports of Their Cognitive Processes During Teaching." *American Educational Research Journal* 15(4): 555-65; Fall 1978.

[11] Christopher M. Clark and Robert J. Yinger. "Three Studies of Teacher Planning." Research Series No. 55. East Lansing, Michigan: Institute for Research on Teaching, 1979.

teaching and learning. The ecological context includes all of the resources, external circumstances, and administrative requirements that limit, facilitate, and shape teacher and student thought and action.

In looking for naturally occurring circumstances in which basic psychological processes and implicit theories might be seen in action, researchers have investigated the psychology of teacher planning. In the various kinds of planning that teachers do, there are opportunities to study how their thoughts are translated into action in the classroom. This research has also led to long overdue attention to the so-called "empty classroom"[9] as well as the active classroom populated with teacher and students. Another site for this kind of research on teaching is the information processing and decision making that go on during classroom interaction. This line of research on teacher interactive decision making is concerned with how and under what conditions teachers decide to modify or abandon a course of instruction while it is under way.[10] Researchers seek to understand, among other things, what the vital signs of the classroom are that teachers monitor and use to organize, guide, and maintain the learning environment.

Finally, researchers on teacher thinking choose relatively open kinds of tasks as promising research

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