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AUTHOR Clark, Christopher M.; Yinger, Robert J.
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ABSTRACT

Three studies on teacher planning procedures are described and synthesized--a survey, a laboratory study, and a series of case studies. The primary goal of this research was to determine how teachers plan classroom activities, why they plan in certain ways, and what is the relationship between teacher planning and teaching effectiveness. A survey of teacher planning practices was conducted to find out how teachers in general view the process of planning. Teachers described the various kinds of planning they engage in, factors that affect their planning, and the reasons for which they engage in planning at various levels. In the laboratory study of teacher planning, the ways in which teacher judgment is used to select teaching activities was investigated. In a field study of teacher planning, case studies were made to trace the entire process of planning from inception, through elaboration and adaptation of the plan to fit a particular class, to implementation of the plan, and, finally, evaluation of the entire process. (JD)

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THREE STUDIES OF TEACHER PLANNING

Christopher M. Clark and Robert J. Yinger

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Teachers' thoughts and decisions are the focus of studies currently under way at Michigan State University's Institute for Research on Teaching (IRT). The IRT, founded in April 1976 with a $3.6 million grant from the National Institute of Education, has major projects investigating teacher decision-making, including studies of reading diagnosis and remediation, classroom management strategies, instruction in the areas of language arts, reading and mathematics, teacher education, teacher planning, effects of external pressures on teachers' decisions, and teachers' perceptions of student affect. Researchers from many different disciplines cooperate in IRT research. In addition, public school teachers work at IRT as half-time collaborators in research, helping to design and plan studies, collect data, and analyze results. The Institute publishes research reports, conference proceedings, occasional papers, and a free quarterly newsletter for practitioners. For more information or to be placed on the IRT mailing list please write to: The IRT Editor, 252 Erickson, MSU, East Lansing, Michigan 48824.

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Three Studies of Teacher Planning[1]

Christopher M. Clark and Robert J. Yinger[2]

An Overview of Research on Teacher Thinking

Behavioral scientists have long been fascinated by the question: What makes a good teacher? Many variations of this basic question occur in the literature of teacher effectiveness research. Behaviorists ask which teacher behaviors are systematically and causally related to student achievement. Researchers on the psychology of personality ask which personality types are highly correlated with measures of teaching effectiveness. Aptitude-treatment interaction researchers ask what types of instructional treatment are most effective with different types of students.

The many forms of the teacher effectiveness question have a few features in common. First, the research objective is to discover "laws" about the relationship between teacher behavior and student achievement. Researchers expect these laws to be applicable over a wide range of circumstances. Second, there is an emphasis on observable behavior, particularly that of the teacher. Third, teacher effectiveness researchers tend to separate the act of teaching into many component parts or variables for analysis. Most experimental designs permit examination of only a very few of these variables in any single study. Finally, the generally accepted criterion for validity of research findings is the replication of those findings in subsequent research studies.

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[1]Paper presented to the American Educational Research Association, San Francisco, 1979.

[2]Christopher M. Clark is project coordinator for IRT's Teacher Planning Study. Robert J. Yinger, a former IRT research associate, is an assistant professor in the College of Education at the University of Cincinnati.

Researchers have learned a great deal from the various forms of teaching effectiveness research. Teacher effectiveness researchers have described classroom interaction systematically and in great detail. These descriptions document the great natural variation in what teachers do, and training experiments reveal a great deal about how to change and shape this teacher behavior. But multiple studies of a few teacher behavior variables have turned up inconsistent results, and no general laws have emerged.

Yet despite this situation, many teaching effectiveness researchers remain undiscouraged. Attempts have been made to re-interpret this body of literature using statistical techniques such as meta-analysis (Glass, 1976; Peterson, 1979), 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 individual studies. Others (e.g., Brophy & Good, 1974) advocate greater sophistication in classroom observation instruments, including the tracking of individual students in their interaction with teachers. Still others suggest that experimental rather than correlational research will sort out the causal links between teacher behavior and student achievement (Gage, 1978). The teaching effectiveness research going on today is far more sophisticated than studies conducted five or 10 years ago.

Other researchers on teaching have responded to the disappointments of teaching effectiveness research in a different way. Instead of advocating refinement of the well-established tools of observation and analysis, these researchers have changed their basic question. Rather than asking "What works?" or "What works with whom?" this new school of thought asks "What is happening here, and why?" The goal of this research

is understanding why teaching is as it is. This work is known as the co itive information-processing approach to research on teaching (NIE, Note 1), and also referred to as research on teacher thinking. (For a review, see Clark & Yinger, 1977.) These researchers hope that by looking at teaching as it is, they can achieve a more satisfying and useful understanding of the forces that shape life in classrooms.

It is much too early to tell whether the cognitive information-processing approach will prove to be a powerful and useful way to investigate and make sense of teaching and learning. But it is not too soon to describe the ways in which research on teaching has changed as a result of a shift in the basic question being asked. These changes are summarized below.

Research Topics and Sites

In the cognitive information-processing approach to research on teaching, there is a great deal of interest in basic psychological processes thought to occur in the teacher's mind 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, beliefs, and values about teaching and learning. The ecological context includes all of the resources, external circumstances, administrative requirements, etc., 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 been led to investigate 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" as opposed to the active classroom populated with teacher and students.

Another site for research on teaching besides teacher planning in its various forms is the information processing that occurs 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. 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 tend to choose relatively open kinds of task as promising research topics. For example, in our research on teacher planning (Clark & Yinger, in press), it seems more profitable to study teachers as they plan for teaching creative writing than to study planning for teaching reading or mathematics. In the school settings in which we do our research, reading and mathematics curricula are largely prescribed and embodied in commercially produced materials and learning systems. Teacher planning is largely eliminated 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, we have an opportunity to observe a wide range of teachers' cognitive behavior as they plan, elaborate ideas, try them out mentally, implement activities in the classroom, and revise, reject, or transform the activities into routines. Teacher tasks that are not severely constrained by habit, prescribed materials, and procedures provide the most promising opportunities for the cognitive information-processing approach.

Methods of Research

The cognitive information-processing approach to research on teaching is generally concerned with the mental processes that are thought to underlie behavior. For this reason, teachers' self-reports of their thought process often constitute the main source of data (see, for example, Bussis, Chittenden, & Amarel, 1976; Morine & Vallance, Note 2; Peterson & Clark, 1978; Yinger, Note 3). Teachers' self-reports have been obtained by interview and questionnaire methods, journal keeping, "think aloud" procedures in which a teacher is asked to verbalize

all of his or her thoughts and decisions as they take place, and by "stimulated recall," in which teachers are shown a videotape or other record of their behavior and asked to recall and recreate the mental processes that were taking place at the time the record was made.

In addition to teacher self-reports of various kinds, observation is an important method of investigation in this approach. Observations of two general types are employed: (1) participant observation, in which the observer participates in and becomes a part of the social phenomenon being studied, and (2) non-participant observation, in which the observer attempts to be as unobtrusive and objective as possible. In the case of participant observation, a technique borrowed from anthropology, the researcher attempts to enter the subject's frame of reference to understand more completely the mental processes and the relation between these mental processes and action. Non-participant observation has been used to compare and contrast teaching activities that are planned with those that are actually carried out. Usually, non-participant observation is paired with one or more of the teacher self-report techniques described above.

In addition to teachers' self-reports and various kinds of observation techniques, researchers on teacher judgment and decision making have borrowed methods from the psychological laboratory, especially policy-capturing techniques using the lens model of Egon Brunswick (Hammond, 1971; Rappoport & Summers, 1973). Attempts have also been made to write computer programs that model the decision-making behavior of teachers and expert reading diagnosticians (Vinsonhaler, Note 4).

In general, the methods used in research on teacher thinking are phenomenological in nature. The teacher and the researcher often find themselves

acting as their own instruments. There are few recognized tests of the validity or reliability of these procedures and techniques. The methods seem to have a persuasive face validity, especially to experienced practitioners. But much work remains to be done in developing, standardizing, and improving these tools for learning about the mental lives of teachers.

The Nature of the Results

It follows from the questions asked, problems investigated, and methods used in research on teacher thinking that the results of this work will be primarily descriptions -- descriptions of teachers' thoughts, theories, decisions, and deliberations. Researchers on teacher thinking do not search for general laws of human behavior and behavior change. Rather, the main benefit of describing the mental lives of teachers will be a set of concepts useful for thinking about, organizing, and making sense of the classroom world. This work could be called "conceptual research" rather than decision-oriented or conclusion-oriented research.

This line of research, in addition to defining and creating concepts useful for understanding teaching, produces portrayals of the formerly hidden or inconspicuous aspects of teachers' professional lives. Teaching has been characterized as an isolated profession, particularly for teachers in self-contained classrooms. Much of what is truly professional in a teacher's life is a private process of applying theoretical knowledge to particular cases, problems, and situations. The classroom observer sees only the results of these private professional deliberations, but a more public description of the thought processes that underlie teacher behavior might serve to unify the profession and provide a basis and forum for professional communication.

Another effect of research on teacher thinking is to foster more collegial relationships between teachers and researchers. The heavy dependence on teacher self-reports in much of this research requires and supports this collegiality. A new respect for the "wisdom of the practitioner" follows from the assumption that what goes on in classrooms is a rational product of teacher decision making and planning. Individual research studies will more likely investigate topics and questions that relate to the needs of practicing teachers when teachers are involved as colleagues in the endeavor. This should help to close the gap between research and practice and to increase the credibility of the educational research community among practitioners.

Finally, the process of doing research on teacher thinking holds the promise of joining formerly separate and independent communities of researchers and bodies of research. For example, research on teacher planning has brought together many of the concerns and issues that have been separately pursued by researchers on curriculum, researchers on instruction, and researchers on classroom management. As one curriculum theorist recently said about research on teacher thinking, "It is encouraging that we may yet learn not only how, but why, teachers translate curriculum programs" (Weiss, 1977, p. 277). The concerns of researchers on instruction and teacher behavior and those of researchers on curriculum and materials all come together in the minds of teachers as they make the plans, judgments, and decisions that guide their behavior. Indeed, the thinking of teachers may be the strategic research topic that yields the first practical theory of instruction.

Planning for Instruction: A Strategic Site for Research on Teacher Thinking

For our purposes, we define planning as a process of preparing a framework for guiding teacher action, a process strongly oriented toward

particular action rather than, say, knowledge or self-development. In this view, the planning process involves teacher thinking, decision making, and judgment. The research described here is concerned primarily with teacher planning for instruction.

The study of teacher planning is an important research topic for four reasons. First, teacher planning is a promising site for the study of teacher thinking and the relationship between thought and action in teaching. Prior research (e.g., Peterson, Marx, & Clark, 1978) indicates that teachers are more able to talk about their thoughts while planning for instruction than to recall their thoughts while actually engaged in instruction. Second, teacher planning is a topic of concern to practitioners. Teacher preparation time increasingly appears as an item in teacher contract negotiations. Furthermore, informal conversation with teachers and educational administrators indicates a conviction on their part that planning for instruction is a very important aspect of their work. Third, the study of teacher planning may serve as a window to the pedagogical ideals of teachers. In describing plans for a lesson, week, unit, or term, and in comparing the actual implementation of a plan with the planned and hoped for scenario, teachers may provide researchers with valuable insights about their implicit theories of teaching and learning and the criteria against which they evaluate their own and other teachers' performance. Fourth, research on teacher planning offers the possibility of linking research on curriculum and research on teacher behavior. These two bodies of research have developed relatively independently of one another, and neither approach has had the dramatic impact on improvement of practice once hoped for. It is our conviction that by studying how consideration of curriculum and instructional performance are brought together in the mind of a teacher during planning, we may be able to

bridge the gap and eventually have a positive impact on the practice of teaching.

Research Questions

A review of the literature on teacher planning will not be presented here. A recent review by Clark and Yinger (1977) indicates that teachers, when planning, do not seem to follow the linear model that is often prescribed in teacher training and curriculum planning. In particular, the teachers studied did not begin or guide their planning in relation to clearly specified objectives or goals. Rather, teacher planning seems to begin with the content to be taught and considerations about the setting in which teaching will take place. The focus then shifts to student involvement as a process objective. The activity, rather than the objective, seems to be the unit of planning. The model developed by Yinger (Note 3) further proposes that planning can be viewed as the progressive elaboration of a major idea, in contrast to the development of a number of alternatives and selection of the optimum alternative from this set. Yinger also theorizes that the nature of the planning process changes as a function of time in the natural history of the school year. That is, planning in September may be a rather different process from planning in March.

Our review suggests that research on teacher planning should focus on more representative field studies of the planning process to complement description and analysis of teacher planning in highly controlled laboratory settings. Beyond this, there is a need for research on the psychology of planning, as well as description of the planning process. At this time, we know very little about why teachers plan, how teacher planning behavior changes with experience, and whether individual difference variables in-

fluence the quantity and style of teacher planning. Finally, there is a need for research on the relationship between teacher planning and subsequent action. This last research topic is perhaps the most promising point of contact between research on teacher thinking and teaching effectiveness. It is here that the outcomes of planning, both in terms of organizing classroom interaction for the teacher and in influencing student involvement and learning can be seen.

The research questions that guide the research described and proposed here can be grouped under three major headings: the how of teacher planning, the why of teacher planning, and the relationship between teacher planning and teaching effectiveness.

The How of Teacher Planning

To answer the question "How do teachers plan?" we require descriptions of both observable teacher behavior and teacher thought processes while planning. We are interested in the amount and distribution of time spent planning, settings in which planning takes place, the types of planning engaged in (both as to scope of the plan, such as yearly or daily, and as to the differences between planning of lessons for the first time compared with revising and adapting previously taught material), variety of the forms that plans take, resources used by teachers, sources of ideas, differences in planning related to different subject matters and differences in the focus of planning (e.g., focus on teacher verbal behavior compared with focus on student activity or teacher physical movement). In exploring the psychology of planning, we need to know more about the psychological processes that teachers use while planning. How do judgment, visualization, memory, and tolerance of uncertainty contribute to teacher planning? How do teachers vary in the number and variety of factors taken

into account during planning? What roles do student characteristics play in teacher planning? Sociological factors such as teacher role definition, institutional press, peer expectations, and administrative regulations can also be hypothesized to shape and limit teacher planning behavior.

The Why of Teacher Planning

In addressing the question "Why do teachers plan?" we are interested both in teachers' motives and goals (internal influences on teacher planning) and external factors that influence teacher planning. Hypotheses we have entertained concerning teacher motives and goals for planning include the reduction of anxiety, insuring equitable treatment of all students, composition of a smooth script for action, increased subject-matter mastery, conformity to teacher role expectations, and compensation for the isolation of the self-contained classroom. What other motives and goals may lie behind teacher planning? What individual differences exist in the mixed and relative emphases of these motivations for planning? Among external influences on teacher planning, we have considered curriculum materials, classroom and school organization, administrative requirements, accountability systems, and preservice and inservice training. In what ways do these and other external factors influence the amount and kinds of teacher planning? What are the consequences of not planning or of poor planning? And how do the forces that influence and motivate teacher planning interact as the school year progresses and the classroom's social system develops?

Teacher Planning and Teaching Effectiveness

In this third focus of our research we are concerned both with teacher effectiveness in planning as an end in itself, and with the effects of teacher planned classroom behavior on student outcomes. What criteria do teachers use

for judging the completeness of a plan? What are the differences, in the eyes of teachers, between good plans and adequate plans? What is important to know before entering the classroom? What part do teacher expectations about students play? What is the relationship of a plan to subsequent interactive teacher thoughts and actions and, through teacher actions, to effects on students?

The Three Studies

Three separate but related studies of teacher planning were conducted during the 1977-78 school year. Each study represented a different approach to investigating how teachers plan for instruction and what psychological processes operate in their planning. In addition, these three studies were designed to validate and elaborate the model of teacher planning proposed by Yinger (Note 3). We hope that these three studies constitute the beginning of a series of teacher planning studies that will investigate more fully each of the facets of Yinger's model.

The three studies were: (1) a survey of teacher planning practices, (2) a laboratory study of teacher judgment in planning, and (3) a field study of the relationship between teacher planning and teacher implementation of instruction. These studies are described in turn below.

Survey of Teacher Planning Practices

The primary purpose of the survey was to describe how elementary teachers in general view the process of planning. Teachers described the various kinds of planning they engage in, the considerations and constraints that affect their planning, and the reasons for which they engage in planning at various levels from yearly planning to daily planning. They answered questions about differences in planning for various subject matters.

Method. The Teacher Planning Survey was distributed to approximately 300 elementary school teachers enrolled in graduate courses at Michigan State University. The teachers were offered $10 to complete and return the survey. Pilot work indicated that the survey took between 1½ and 2 hours to complete. Seventy-eight usable surveys were returned, for a response rate of 26%.

The first part of the survey was used to describe the personal characteristics of the respondents. Of the teachers completing the survey, 78% were female and 22% were male. The mean number of years of teaching experience was six (s.d. = 4.0) and ranged from one to 23 years. The teachers responding represented every grade from kindergarten to sixth, with 45% presently teaching in the primary grades (K-3) and 26% presently teaching in the upper elementary grades. Ten percent were subject matter specialists, and another 10% were in special education. Most of the respondents taught in self-contained classrooms (70%), with 22% in team teaching situations, and 12% in non-graded classrooms. The teachers characterized the schools in which they taught as either urban (24%), rural (36%), or suburban (40%). All of the teachers had some graduate training, with 3% holding specialist degrees and 18% holding masters degrees.

The second part of the survey asked teachers to report the amounts of time they plan during a typical week for various subjects and activities; to describe the locations and circumstances in which they plan, and to list the different types of planning that they do.

Part three of the survey involved writing detailed descriptions of three actual plans that each teacher had made and implemented in his or her classroom during the current school year. The teachers were asked to select and describe examples of plans representing the three most important types of planning that they did during the year.

Finally, the teachers were asked to compare and contrast their planning in language arts, mathematics, science, and social studies, and to respond to the question "What purposes does planning serve for you?"

Results. Based on the Survey of Teacher Planning Practices, it appears that:

-- Learning objectives are seldom the starting point for planning. Instead, teachers plan around their students and around activities.

-- Teachers tend to limit their search for ideas to resources that are immediately available, such as teacher editions of textbooks, magazine articles, films, and suggestions from other teachers.

-- Teachers indicated that most of their planning is done for reading and language arts (averaging five hours per week), followed by math (2.25 hours/week), social studies (1.7 hours/week), and science (1.4 hours/week).

-- Teacher planning is more explicit and involves a longer lead time in team-teaching situations than in self-contained classrooms.

-- The most common form of written plans was an outline or list of topics to be covered, although many teachers reported that the majority of planning was done mentally and never committed to paper.

-- Planning seems to operate not only as a means of organizing instruction, but as a source of psychological benefits for the teacher. Teachers reported that plans gave them direction, security, and confidence.

The Laboratory Study of Teacher Judgment in Planning

Teacher judgment is important in the problem formulation and problem solving stages of the Yinger model of teacher planning. This study was designed to investigate the ways in which teacher judgment is used to select teaching activities.

Method. Teachers were asked to make judgments about language arts activities from a set of activity descriptions that varied systematically on five preselected cues or dimensions important in teacher judgment

(student involvement, integration, difficulty, fit between purpose and process, and demand on the teacher). In addition to the policy capturing approach of generating regression equations that characterize teachers' judgmental policies based only on their activity selections, we asked some of the teachers to think aloud as they made their selections. The think-aloud protocols provided the raw material for a process-tracing approach to characterizing the teachers' judgment processes. Hence, we were able to compare products of two methods of describing teacher judgment based on the same task. In addition to the substantive knowledge we gained about the ways in which teachers make decisions, we addressed an important methodological question.[3]

Twenty-five upper elementary teachers participated in the judgment study. Six of these teachers also participated in a process tracing of their thinking during the judgment task. Each teacher was asked to rate 32 different language arts activities on attractiveness, appropriateness, probability of use, and effectiveness. Regression equations were computed yielding a judgment policy for each of the four judgments for each teacher.

Results. Preliminary analyses of the Laboratory Study of Teacher Judgment in planning indicate that:

-- For some teachers the five manipulated activity dimensions accounted for as much as 50% of the variation in their ratings, and for others there was no systematic relationship between the five dimensions and teacher judgments.

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[3] A study by Yinger (Note 5) examined the judgment processes of pediatricians using a design similar to the one described here. Yinger also contrasted the results of policy-capturing methodology with a process-tracing approach in that study. The present study applied this design to an educational setting and avoided some of the methodological problems that Yinger encountered in his earlier work.

-- Fifteen of the 19 teachers whose policies we examined had regression equations that accounted for a significant proportion of the variance in their ratings of activities on at least one judgment, 13 of the 19 had significant policy equations on at least two of the judgments, 11 of the 19 had significant policy equations for three or more of the judgments, and six of the teachers had significant policy equations for all four.

-- In cases in which the five manipulated activity dimensions accounted for a significant proportion of the variance in teacher ratings, the regression equations ranged from simple to complex. Of the 19 teachers whose policies we examined, six had policies that could be expressed in terms of all five manipulated activity features, two had four-feature policies, two had three-feature policies, and one teacher had a one-feature policy.

-- In the 43 significant policy equations obtained from analyzing the judgments of 19 teachers, the activity dimension contributing most frequently as a predictor of teacher judgment was Student Involvement, followed by Integration, Difficulty, Fit Between Purpose and Process, and Demand on the Teacher.

-- Results of the process-tracing analyses suggest that the teachers engaged in a four-step process when making judgments about activities. First, the teacher tried to understand the activity. Second, he or she imagined using it in the classroom. In the third step, the teacher thought of ways to modify or adapt the activity to avoid problems foreseen in Step 2, and finally, the teacher created a mental image of the revised version of the activity. It was this "mental version" that teachers seemed to be judging when responding to questions about each of the activities.

The Field Study of Teacher Planning and Plan Implementation

The purpose of this study was to trace the entire process of planning, from the moment a teacher first came into contact with an idea or a set of materials through the elaboration and adaptation of the plan to fit a particular class of students, to implementation of that plan, and, finally, evaluation of both the planning process and the implementation of the plan. The study is seen as a longitudinal case history of a plan. In this study, we observed the planning process in considerably more detail than the

questionnaire or interview methodology permits, and with considerably more realism than the judgment study described above involves. The study is a replication of parts of Yinger's 1977 case study of teacher planning.

Method. Each teacher kept a journal documenting his or her planning and thinking about planning in great detail. Biweekly interviews and classroom observations by researchers were used to supplement the journal data. The study produced life histories of five plans. One plan was produced jointly by a two-teacher team, and the remaining four plans were developed by teachers working alone.

Each teacher was asked to plan a two-week unit on writing that he or she had never taught before. We allowed about three weeks for planning and two weeks for classroom enactment of the plan.

Results. Each of the plans was unique; the topics and activities were different for each teacher. Our first attempts to summarize the life histories of the five plans were in terms of Yinger's psychological process model of planning. In general, we found support for the model. A cyclical planning process rather than a linear one was characteristic of all the plans. Rather than moving from well specified and carefully stated objectives and proceeding to designing activities to meet these objectives, our teachers more commonly began with a general idea and moved through the phases of successive elaboration.

Evidence was also found for a distinction between the problem finding stage of planning and the problem formulation/solution stage. Some of the teachers spent a great deal of time and energy generating a topic or idea for their writing unit. The search process appeared to be distinctly different from the elaboration and refinement of the idea in subsequent planning.

A third confirmation related to the process model was the suggestion of a phase structure to the design process used by some teachers. These teachers were observed progressing through the successive phases of elaboration, investigation, and adaptation at different periods in their planning.

At this very general level, then, we have found that the process model of teacher planning fits well with the planning that we have observed. At a more molecular level, however, we found that there were interesting individual differences in how our teachers followed this general process.

One interesting distinction among teachers found in our preliminary analysis was related to the comprehensiveness of the teachers' plans. Two of the plans were characterized by little time spent generating an idea, i.e., a short problem finding stage, brief unit planning, and considerable reliance on actually trying out an activity in the classroom. The remaining three plans, in contrast, were characterized by a longer problem finding period, a more elaborate unit planning process, and less reliance on actual classroom tryout. The former group we have come to describe as incremental planners. By this, we mean that they seem to prefer to move in a series of short planning steps, relying on day-to-day information from the classroom. The latter group we call comprehensive planners. These teachers were more concerned with developing a well-defined framework for future action at a more comprehensive level. They tended to be more concerned with the unit as a whole, and were very careful to specify their plans as completely as possible before beginning to teach.

The product that the incremental planners were most concerned with was an activity or a set of activities to get the unit started. Once this activity was implemented, the problem for these planners became one of

answering the question, "Where do we go from here?" The planning cycle in incremental planning moved between actual classroom experience with the plan and reflection on what the next logical step should be, given the particular reactions of the students to the initiated activities. Incremental planners in our study placed a high value on spontaneity and on staying in close contact with the needs and states of their students. One of our incremental planners explained that she had had unpleasant experiences in the past with making elaborate and detailed plans that "bombed" because they were inconsistent with student needs at the moment.

It seems to us that incremental planners buy the advantage of remaining in tune with their students at the expense of not necessarily knowing where they are going. When difficulties are encountered in mid-implementation, the incremental planner does not have a detailed unit plan to re-examine, adjust, trim down, or otherwise modify to meet the difficulty. In one of our cases, when the students did not respond enthusiastically to the teacher's opening gambit, the only alternative that occurred to the teacher was to drop the entire unit.

The comprehensive planner spends a great deal of time and energy in both the problem finding and design stages of the psychological process model. The main product of these deliberations is a very detailed long-range plan. The trying out of this plan or activities that compose it is usually done mentally or vicariously, rather than actually in the classroom. The elaboration, investigation, and adaptation processes of the design cycle are built much more on predictions about how students might or might not react to implementation of the plan. Before the plan is actually implemented, the teacher has a rather complete picture of what to anticipate. When difficulties or unanticipated events and distractions occur during

implementation, the planner can refer back to the fully elaborated unit plan as an aid in deciding how to solve the problem. For example, one of our teachers who was a comprehensive planner found that the teaching of his unit was going much more slowly than he had thought it would. His reaction to this difficulty was to re-examine the plan and eliminate some of the activities and objectives that he had earlier intended to include in later stages of the unit.

The comprehensive planner has something to go back to when adaptation is necessary. The incremental planner, in a sense, must go back to square one after each activity. Of course, the disadvantage of comprehensive planning might be that the teacher feels locked into a course of action that might not be in tune with the needs and states of his or her students. In addition, it seems that a great deal more time and energy are required in comprehensive planning before implementation can even begin to take place than in incremental planning. Comprehensive planning may also call for considerable confidence in one's ability to predict the reactions and responses of students. Comprehensive plans are much more likely to be successfully implemented when the teacher has guessed right about how the activities will be received, and much more likely to be frustrating experiences when student reactions are quite unpredictable.

Both comprehensive planning and incremental planning seem to be adaptive for the teachers who use them. It may be that the same teacher would be described as a comprehensive planner for certain situations and as an incremental planner for others. We have no basis for suggesting that comprehensive or incremental styles of planning are traits or characteristics of the planner that are resistant to change or in some fundamental way part of the personality.

In addition to these general and preliminary results of the field

study, we found that the process of journal keeping was a very powerful experience for the teachers who undertook it. They reported that they learned a great deal about their thinking and teaching. Until asked to keep a detailed report of their planning, they did not realize how much thought and energy they put into planning for instruction. In a sense, they were newly appreciating themselves as professionals. This leads us to believe that structured jounal keeping might be a powerful tool for inservice teacher training.

Discussion

The three methods of inquiry we used in our research on teacher planning have inherent strengths and limitations. The survey method allowed us to contact a relatively large number of teachers and to learn about the different types of planning that they do. A limitation of the survey was that the teachers were asked to recollect and describe plans they had made in the past. Thus the survey produced rather general descriptions of different types of teacher plans, possibly distorted by memory lapses.

The study of teacher judgment was much more narrowly focused than the survey. The judgment task was characterized by considerable experimental control. The materials, the task, and the experimental situation were identical for all participating teachers. Yet this experimental control may have been bought at the cost of representativeness. The judgment task itself (especially for the six teachers who thought aloud) was different from anything they had done before, although not so different that they found it unreasonable or too difficult to perform. As a result, we have learned how teachers exercise judgment about language arts activities under a particular set of conditions. At this time, we do not know the extent to which our

findings generalize to other judgment situations.

The field study of a plan's life history permitted us to observe teacher planning as it happened. The journal and interview method provided more depth and detail than the survey and was more realistic than the judgment study task. But this method is very time-consuming. We were able to work with only six teachers, and their accounts of the planning process are shaped in unknown ways by the limits of introspection and self-report."

Each of the three studies, with its strengths and limitations, can stand on its own as a modest contribution to our knowledge about teacher planning. What we are concerned with here is how the composite picture of teacher planning that is emerging from our work might be greater than the sum of these individual parts. This could be the case if we take the position that the researcher is the primary instrument of investigation in studying phenomena as complex as teacher thinking in naturalistic settings. Both the description of the phenomenon of interest and the understanding of how things work and come to be the way they are result from changes in the researcher's conceptualization of his or her experience. The data themselves do not tell the story. Rather, the researcher tells a story that is grounded in his or her experience in collecting the data. The process of doing research leads to understanding that which is investigated. In a way, the data that result from a research study constitute the residue of symptoms or artifacts of this research process.

This view of the researcher as instrument led us, perhaps unconsciously, to pursue several different kinds of research on teacher planning more or less simultaneously. In retrospect, this process of simultaneous multiple methods of research makes good sense because we believe that the tension of having to take different perspectives on teacher planning as we built our

mental conceptions of what planning is, how it works, and what its effects are, led us to a richer and more multidimensional picture of teacher planning than we might otherwise have developed.

Recall our assumption that what teachers do is rational and sensible. Our question then became, "In what way does this or that instance of planning make sense?" By experiencing multiple types of planning and describing and investigating them through different methods, we were forced to integrate the many different ways in which teachers make sense of their experience and to sort out the underlying processes common to all or almost all cases of planning.

In a way, we used the more traditional approach to data analysis as a sort of stimulated recall exercise. That is, our examination of the artifacts of the research process help us to make explicit, justify, document, and illustrate to others what we have learned about teacher planning during the research process itself. There is an important distinction between what we are describing here and a completely subjective or ideographic approach to behavioral science. In the present case we have made explicit the theoretical constructs that we used in entering, perceiving, and making sense of instances of teacher planning. This theoretical framework is not so crystalized as to be unmodifiable by experience. But it does provide an initial set of categories by which we classify and organize what we see. In this kind of research, the researcher is inevitably torn between a desire to test or elaborate theoretical ideas and a desire to understand the situation in the same terms as the participants. Only by alternating back and forth between grounded theory building (grounded in the phenomenology and conceptual categories of the participants) and a theory testing and elaboration mode can we build a genuinely useful theoretical structure.

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