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ABSTRACT

Factors influencing teachers' decision making in the classroom were studied. Fourteen elementary school teachers in five schools were observed and interviewed. Observations focused on formal, organized classroom activities, and interviews centered on what basis, or for what reason, a particular procedure or curriculum material was employed. Types of support components available to the teacher in making decisions included colleagues, mandated district curriculum, published research, textbooks, commercial publications, the school principal, and personal experience. The teachers ranked student characteristics first and curriculum materials second as factors influencing how they proceed in the classroom. An inservice training program, referred to as Professional Development Program Improvement Center (PDPIC), was cited as a valuable source of decision making support, as well as the "Stull Objectives," a teacher improvement system similar to PDPIC but focusing on behavioral management. Colleagues were also seen as supportive, in particular when acting as part of a team. A microcomputer was cited by one teacher as a source of support. Extensive observational and interview data is presented on 3 of the teachers, and data from the other 11 are summarized. The questionnaire used in the study is appended. (JD)

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SUPPORT SYSTEMS AND TEACHER DECISION MAKING: AN EXPLORATORY STUDY[1]

Introduction

The research reported here is exploratory in several respects. The number of teachers (14), day long observations per teacher (3), schools (5), and school systems (2) is small. Secondly, the theoretical framework for the research derives in part from a personal interest in extending the anthropological dimension of theories of teaching presented at the National Conference on Studies in Teaching (National Institute of Education, 1974). Finally, the parameters of the decision-making process used in the research reflect an interest in employing units of analysis or behavior segments which serve the purposes of ethnographic studies of teaching and teacher decision making.

The immediate objectives of exploratory research relate to conceptual and methodological questions. To what degree are the clarity and applicability of key concepts confirmed by the findings? Given the focus of inquiry, does the research process employed yield up the most pertinent data? Are the data informative enough to warrant further investigation? The long range implications of this research concern improvements in mode and substance of interventions intended to improve educational practice. How teaching in particular

can be more effective continues to be perhaps the single most important goal of educational research. It is a goal that has not yet yielded up overwhelmingly convincing results. Overall assessments, whatever the perspective or time, are depressing in their similarity. In 1964 the following:

> Recent summaries have revealed that literally thousands of studies have been conducted on teacher excellence since the beginning of the twentieth century. Investigators have looked at teacher training, traits, behaviors, attitudes, values, abilities, sex, weight, voice quality, and many other characteristics. Teacher effects have been judged by investigators themselves, by pupils, by administrators and parents, by master teachers, by practice teachers, and by teachers themselves. The apparent results of teaching have been studied, including pupil learning, adjustment, classroom performance, sociometric status, attitudes, liking for school, and later achievement. And yet, with all this research activity, results have been modest and often contradictory. (Biddle and Ellena, 1964, p. VI)

In 1978:

> "If the object of (educational) research is the development of coherent and workable theories, researchers are nearly as far from that goal today as they are from controlling the weather." This assessment of educational theory was made by Shulman in 1970 (p.371). The fact that we have progressed little from this situation in the last seven years is reflected in recent statements by Mitzel (1977). Mitzel suggests that the practice of education, insofar as it is based on educational research, has moved forward as far as it can go without an infusion of new concepts, new assumptions, and new theory. (Yinger, 1978, p. 7)

So we probe and poke, measure, watch, and listen--and in a time of severely limited resources and increasing public concern about the quality of schooling the quest is even more pressing and interventions to improve educational practice more crucial. The argument warranting this research is that the improvement of practice will be enhanced if intervention can be more systematically integrated into a support system that is operational from the standpoint and experience of teachers. Put another way, the intent is to make such intervention less random and idiosyncratic.

The focus of this research is pedagogical support systems and their use by teachers in classroom decision making. As teachers plan and implement lessons, elaborate on them, improvise, respond to unanticipated student behavior, they have available a profusion of support components: textbooks, district curriculum supervisors, workshops, professors, colleagues, the principal, published research, their own experience. How a teacher relates to support components may be determined more specifically through answers to such questions as the following: What is the comparative use and value (as perceived by teachers) of the various support components? Are there patterned connections among the components which teachers regularly activate in classroom decision making. Can such connections or interactions be legitimately viewed as constituting a system? If so, what does such a system "look like"? How do teachers perceive it? Are there in fact multiple, overlapping systems whose uses vary with the substance of the decisions. The above and related questions are considered in this study.

Related Theory

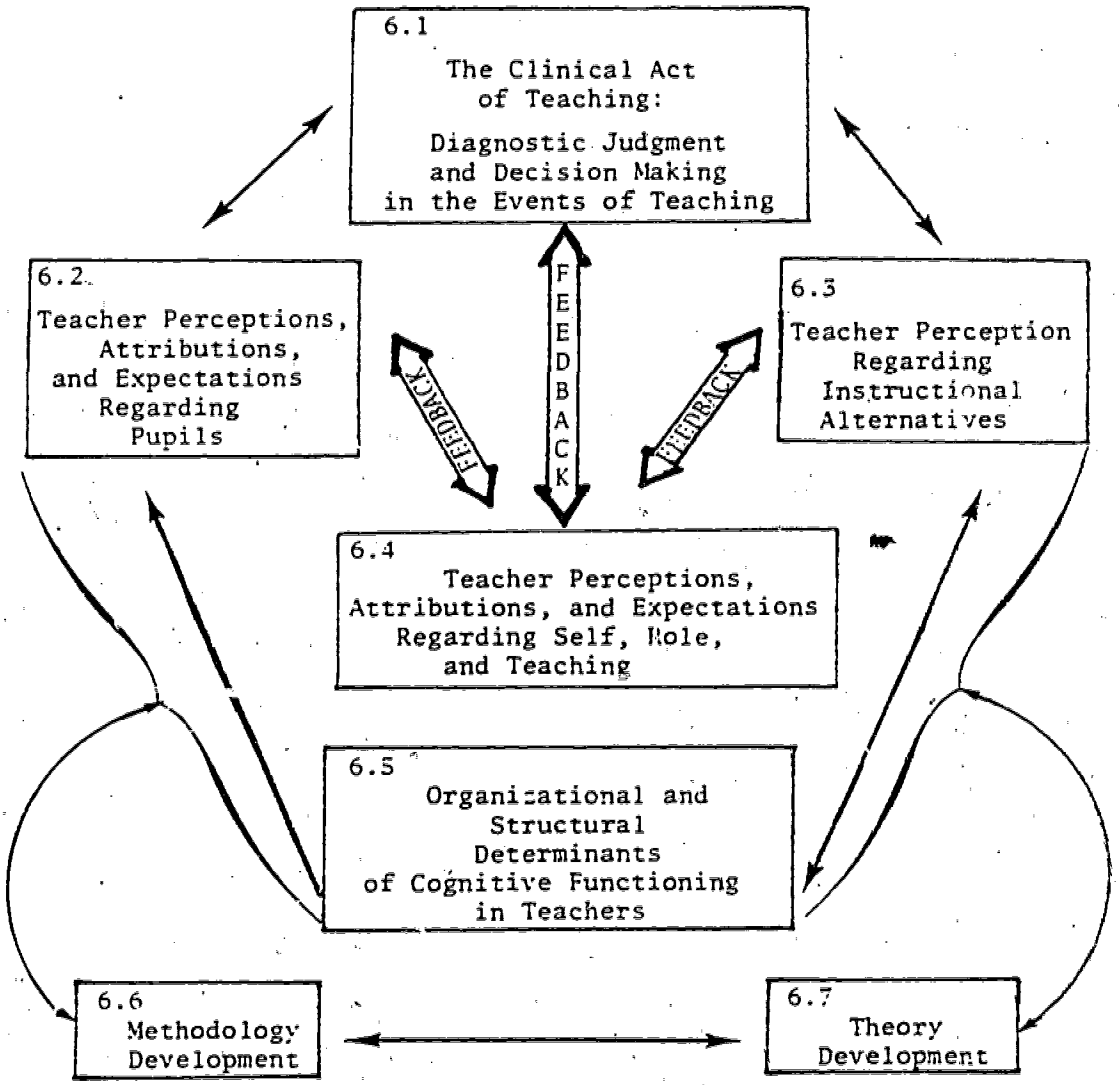
Though the focus of this research is on teacher assessment and in-class use of support systems, the topic clearly carries the inquiry outside the classroom. Support system components, as these are identified here, are scattered throughout an educational institution. Hence ultimate explanations for teacher use of support systems must be placed in context. In this regard organizational/environmental studies about schooling are relevant; e.g., Moos' educational environments (1973), Becker's idea of school as a self-contained system of social control (1953), Clark's formulation of school as a "vulnerable bureaucracy" (1964), Weick's "Loosely Coupled Systems" (1976), and the work of the Center for Educational Policy and Management, particularly a recent publication, Transforming the Schools' Capacity for Problem Solving (Runkel, et. al., 1978). The authors view schools as living, open systems with interior operations organized through subsystems which are in turn defined as "a collection of persons (along with the materials and tools they use) that is distinguishable by having one or more specific tasks (functions) to perform and by the fact that its members engage in more communication with one another about those tasks than with persons outside the subsystem." (p.31) The variables which are believed to have important effects on a school's capacity to solve problems and to maintain that capacity include two which are especially pertinent to this study: accessibility of appropriate expert services or technical information from outside the system or subsystems and skill as a group at making use of outside helpers.

The theories of teaching discussed at the NIE Conference represent a view of teaching from within the classroom. Models of teaching are presented in which teaching is characterized as either human interaction, behavior

analysis skills, performance, linguistic process, or clinical information processing. Among these theories clinical information processing offers the most congenial framework for subsuming decision-making processes and support systems use. Figure 1 presents the theory[2].

Figure 1

Approaches to the Study of Teaching as Clinical Information Processing

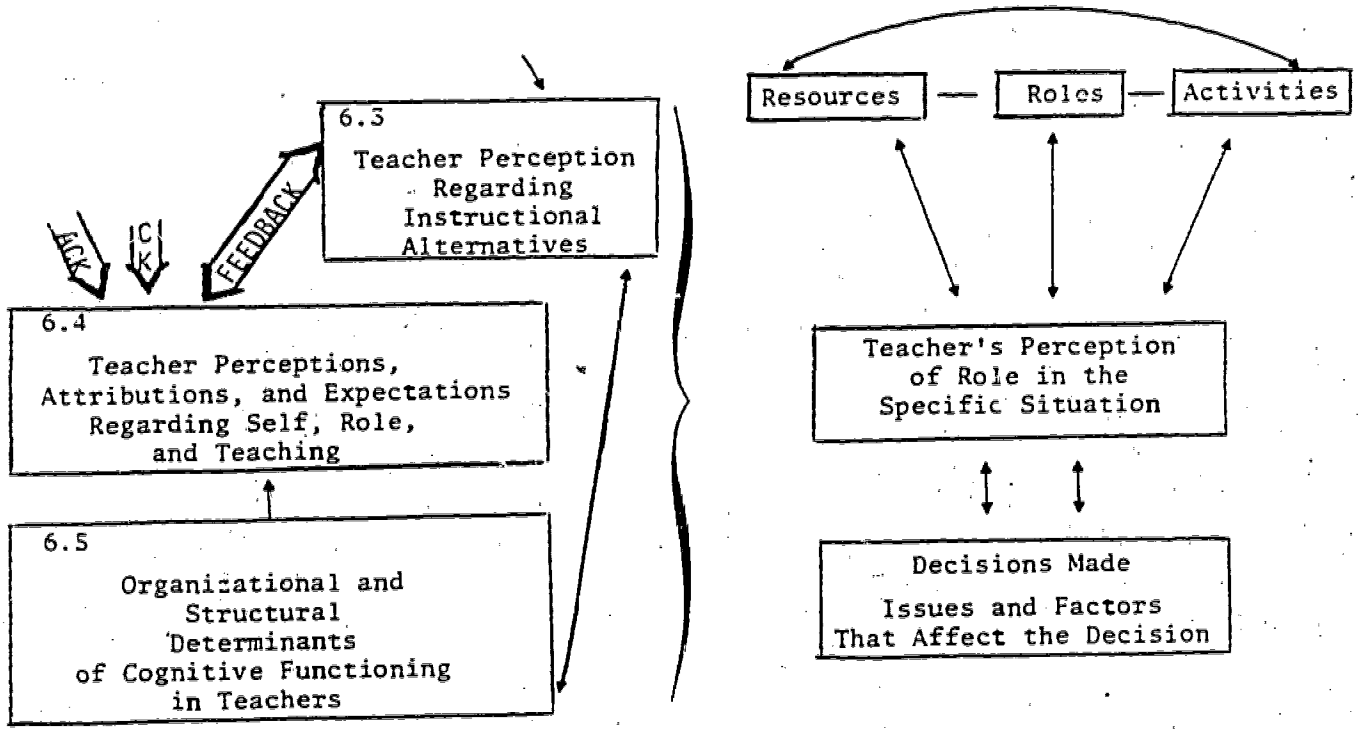


(Shulman, 1974, p. 6.6)

This research is most directly related to the "approaches" involving teacher perception regarding instructional alternatives; teacher perceptions, attributions, and expectations regarding self, role, and teaching; and organizational and structural determinants of cognitive functioning in teachers. A rough translation of these approaches into the design for this study is rendered in Figure 2.

Figure 2

A Design for This Study



In this design teacher decision making is a function of what is expected (role), what is generally required (activities), and what support is provided (resources). Teachers process these interrelated factors and a decision follows. The decision is, in Smith's terms, a "subjective probability" statement (Smith, 1968) that

the particular course of action chosen will under prevailing circumstances work better than alternatives. Recent studies have examined a variety of constituent factors that shape decision making behavior: cognitive processes (Peterson, P. and C. Clark, 1978; Mackay, D. and P. Marland, 1978); subject matter content (Zahorik, J., 1975; Schwille, J., 1979); estimates of student aptitude (Shavelson, R., J. Cadwell, and T. Izu, 1977). Clark and Yinger (1978) observe that the connection between a teacher's implicit theories and behaviors are mediated by circumstances such as availability of resources, colleague influence, and student characteristics. While there is evidence in this research of the influence of student characteristics, the focus of this study is on teacher reports about the role of resources or support components in classroom decision making.

Methodology, Sites, and Population

If during a math lesson a teacher says, "All right, class, open your book to page 27 and do the first three problems.....No, wait, do the first two problems on page 29 instead" he/she has made at least two decisions and has also expressed a preference regarding the use of a support system component, in this case pages from a textbook. When a history teacher plans and presents a lecture/discussion on the Civil War for half of one period and assigns an in-class essay for the second half of the period, again two decisions have been made--this time at the lesson plan stage--and then implemented. If all does not go according to plan (the lecture/discussion falls flat after only half the time allotted to it) and the teacher has to improvise, additional decisions are made.

Such decisions vary in complexity and consequence--in the kind of teacher/pupil behavior that follows from a decision, in time frame, in support components or resources needed and used, in what one might learn about the cultural substance and context of teacher belief and behavior. With such variation methodological problems arise concerning the most appropriate unit of analysis to use in isolating and analyzing decision making behavior segments. In an earlier publication (1969) I presented a unit of analysis for teacher behavior that, I argued, was functional to an anthropological perspective on schooling. That formulation, of "teacher encounters," was heavily influenced by the work of Biddle and Adams (1967, pp. 45-73). They identify four major units of analysis: a) arbitrary units of time, generally used in conjunction with some system of behavioral categories; b) selected, naturally occurring units, in which the focus is on behavioral categories such as control incidents;

c) analytic units, based on concepts employed by the investigator which may or may not be seen as a "natural" unit, e.g., a move, an episode, a teaching cycle, a strategy; and d) phenomenal units, defined by the authors as "natural-appearing" breaks in the stream of classroom processes that may reasonably be assumed to be recognized by classroom participants. "Teacher encounters" were conceived as natural-appearing units of interpersonal interaction and were identified in terms of an activity, a population and resources. In this study decisions of most interest are those which relate to "natural appearing" classroom activities.

Data sources were classroom observations and interviews. Observations focused on formal, organized classroom activities--what in essence the teacher was having the pupils do. Interview questions centered on the derivation of classroom activity decision--on what basis or for what reason a particular procedure or curriculum material was employed. Interviews were scheduled as close as possible to the time of observation. Frequently they were held during the school day in an area adjacent to the classroom. The teachers had instructional aides who supervised the class while we talked. Most interviews were taped. Portions of transcripts and of observational notes are reproduced here as appropriate. Near the completion of the study a questionnaire was sent out to obtain additional information on biography and on attitudes about support components (Appendix A).

In the proposal for this research the group of teachers studied was to be as diverse as possible--in male-female representation, racial/ethnic background, age, and years of teaching experience. School settings were also to be diverse--rural, suburban, inner city. An institutional change on my part

resulted in a narrower range of site and population characteristics. The teacher and pupil population in this study are markedly homogeneous. The three school districts are located in the central coastal area of California. La Vista County has a population of approximately 160,000. The primary industry is agriculture. Of the nearly 2,125,000 farm acres, 500,000 are tilled and approximately 35,000 are under irrigation. Wheat, barley, sugar beets, fruits, nuts and other crops are produced. There is a thriving wine industry. The largest single employer in the County is the State, with a California State University campus, a community college, a correctional institute, a state hospital, and other agencies.

Ten of the 14 teachers involved in the study come from three elementary schools in the north county community of Mirada Springs. Its population is slightly over 9,000. The school district has four elementary, one middle, and one high school. To the south, 25 miles, and stretching from the coast inland about 10 miles is the second school district involved. La Vista is a university community of some 35,000. The district has 14 elementary schools, one junior high and two senior high schools. There is also a continuation school. Three of the teachers observed and interviewed come from one elementary school in this district. The third school district, in the far northern part of the county, has only one school--and that school, one room and one teacher. Aurora is a farm/ranch community of some 400. Table 1 provides data on the distribution of teachers by school.

Table 1 Number of Teachers by School and Sex

School	Community	M	F
Catherine Grant	Mirada Springs	0	6
Florence Martin	Mirada Springs	1	2
Conrad Thomas	Mirada Springs	1	0
Willow Creek	La Vista	2	1
Aurora	Aurora	1	0
	Total	5	9

The average age of the teachers is 38 years, with a range of 25 to 61 years. Average number of years of experience is 12, with a range of 3 to 36 years. Table 2 provides information on the racial/ethnic composition of the pupil populations in the schools involved.

Table 2 Racial/Ethnic Composition of Pupil Population by School

	American Indian or Alaskan Native	Asian or Pacific Islander	Hispanic	Filipino	Not of Hispanic Origin		Total
					Black	White	
Catherine Grant	1	3	34	2	18	301	359
Florence Martin	1	4	55	0	12	259	331
Conrad Thomas	7	12	46	0	17	403	485
Willow Creek	0	5	46	3	16	208	275
Aurora	0	0	0	0	0	14	14
Total	9	24	181	5	63	1185	1464

The percentage of pupils receiving free lunches ranges from 0% at Aurora and 11% at Catherine Grant to 27% at Florence Martin.

Socioeconomic data on classrooms and schools can be linked to teacher decision making. When student characteristics qualify a school for special programs, federal and state funding impose program prescriptions which invariably affect instructional decisions. One may assume, too, that achievement levels and scores on statewide standardized tests have an impact. The purview and interest of this study do not include a delineation of such factors. They are identified only if the teachers themselves perceive them to influence decisions.

The question of how most appropriately to present the data and findings from this research needs to be considered. The nature and objectives of any inquiry inevitably effect the mode of data presentation. With an exploratory study there is, in my opinion, license and obligation to provide a reader extensive samples of data in comparatively raw form in order to give the reader sufficient basis for critiquing my interpretations. Hence I have organized the presentation of data in two parts. (1) Extensive observational and interview data on three teachers in one school will be presented.[3] Data on all teachers observed in one school are presented in order to consider the effects of colleagues as well as the principal on decision making. The school, Willow Creek, was selected because data on decision making there seem to offer more insight into teacher use of support systems as contrasted with the use of discrete support components. (2) A second section will present data on decision making from the remaining schools in order to encompass the widest range of types of decisions made and support components utilized.

Willow Creek School: Three Teachers

Willow Creek School has two campuses with a total enrollment of 275 pupils, lower grades in one and upper grades in the other. Although the school has a Title I designation its pupil population, like that of other schools in the district, is not sharply distinguished by divergent socio-economic or ethnic/racial categories. The pupils, like the teachers and the community are predominately white, middle class.

Dave Elliott

Dave Elliott, 46, is married and has one son, age 16. Elliott was born and raised in the mid-west, began his college work in engineering, and then changed to math and physics. He left the university for naval duty and when he returned he majored in social science and prepared to become a teacher. He has been teaching 20 years, all at the elementary level, and 15 years in the La Vista District, the last 10 at either Willow Creek or its companion school. The enrollment of Dave's combined fourth-fifth grade class is 28.

Observational and associated interview data presented below are organized around instructional activities (or activities directed at producing behavior change instrumental to instruction). These activities are what was referred to earlier in this paper as "phenomenal units," that is, planned activities by teachers and which incidentally regularly appear on a blackboard as the schedule for the day. The report on each activity is divided into three parts: (1) time of day and length of activity, (2) summary description of activity based on observations, and (3) interview notes related to activity. Activities presented in this section are generally sequenced according to time

of day. They are not all necessarily from the same day, but I have taken care not to ignore the context in which decisions relating to a particular activity are made. Where decisions clearly derive from or are influenced by events and decisions in a previous activity both are reported. The first activity reported in Dave Elliott's classroom, "opening period," contains more than one phenomenal unit and hence could be further broken down into specific activities. It is presented here as one activity because "opening period" is itself an organizing concept in which a variety of different activities may occur day by day.

1. Opening Period

Time: 8:45 - 9:32

Observations: Class begins at 8:45 a.m. Dave reviews a spelling test and work to be done on grammar. Checks absences, takes lunch count, and tells them to take out notes for newsletter to be written for parents. Says noise level to be at #1. Has the Pledge of Allegiance and asks them if they have any news they want to share. A boy says he is going skiing the next weekend. A girl says her mother is getting married. In each case Dave responds and a short exchange takes place concerning details and feelings. At 8:55 a.m. Dave dismisses the group taking band instrument lessons. The remaining pupils begin a Spanish lesson with the classroom aide. The school counselor appears at the door and Dave goes to the door to talk to her. As the Spanish lesson continues he proceeds with various tasks: leaves classroom and returns in three minutes, goes next door to check his team-teacher's room (there is a substitute), sits and watches the Spanish lesson, checks a boy's paper, leaves the room again, returns quickly and watches lesson again. As pupils return from music instruction he puts them to work on a geography unit.

Interview: Band instrument instruction is a district wide program for upper elementary grades which pupils may choose. Spanish instruction started this year because of a new student with a Mexican background whose mother did not want him to lose the language. Dave asked her to teach a small group two days a week. She did and when she had to withdraw, the aide who was studying Spanish took over instruction. Three days a week when there are no instrument lessons she teaches Spanish to the entire class. Had the aide not been able to teach Spanish Dave says he would have tried himself, though "rusty," because of the benefits to children of learning a new language, especially Spanish.

2. First Reading Group

Time: 9:32 - 9:55

Observations: The first reading group is the more advanced of two reading groups. The lesson takes place at a table in the cafeteria which is adjacent to the classroom. Dave starts by asking them to "Think of five things you did between the end of the previous period and right now." He is using an overhead projector, writes the statement on paper, and solicits examples from pupils. A list is developed. The lesson is on sequence. He closes the discussion, hands out a text, New Paths Practice Book, and assigns them exercises for the rest of the period.

Interview: Within the context of a standard required reading program, the work Dave is doing reflects, he says, the influence of standardized test scores. Last year's scores indicated a need to work on comprehension, more particularly inference, questioning, and determining best answer. The text he is using, New Paths Practice Book, became available to him through a series of decisions involving the principal and several of his colleagues. The school textbook committee recommended that the faculty agree to "test" the series--at the request of the publisher. Dave uses the text as a source of practice material.

3. Second Reading Group

Time: 10:20 - 10:50

Observations: The format is the same as with the first reading group. The pupils sit at a table in the cafeteria. The textbook is from the series being piloted. Dave assigns them paragraphs to read and then asks them to write questions that can be used to determine if someone else has read the material.

Interview: Because the group is the weaker of the two his goal is to stimulate their interest. He reasons that writing questions is harder and more interesting than answering questions.

4. Higher Math Group

Time: 10:[illegible] - 11:15

Observations: The group gathers in the cafeteria. Dave is at one end of a table where the overhead projector is placed. He hands out paper for them to use and proceeds with addition exercises using single and double digit columns. With some columns he employs decimals.

Interview: The group is the weakest in math. They are called Higher because they can go "higher". He keeps looking, he says, for teaching "ploys" that will help students succeed. He believes his conviction that achieving more self esteem is very important to this group is a significant factor in decisions he makes.

5. Monthly Election of Class Officers

Time: 1:00 - 1:15

Observations: Dave calls them to order and asks the incumbent president to supervise new elections of class officers. We take chairs just outside the classroom door so he can monitor the class while we talk. During the interview, Dave returns to the classroom twice to keep them "on task".

Interview: Elections are held every month and students cannot hold office more than once during the year. In past years he has had elections only every semester, but he decided last year's class and this one needed to learn more parlimentary procedure and needed to learn to be more independent in managing classroom life. So he changed to monthly elections.

6. Educationally Wise Choice Time

Time: 1:15 - 1:30

Observations: Dave announces to the class that when elections are finished the next 15 minutes will be "educationally wise choice time." We return to chairs outside the classroom door to talk and the pupils proceed with various individual activities. During the period one girl comes with a question in connection with a list she has made. Dave questions her about what she is doing. The girl concedes it is not a wise choice and she returns to do something else.

Interview: "Educationally Wise Choice Time" comes, Dave says, from his team teaching partner, Cecilia Bancroft, who uses it as an integral part of the instructional system she employs. It is the first year Dave has used it. By this time of year he judges that probably half of his students can be on their own with respect to choices. The rest still need direction in making choices. His interest in using the technique also comes from what he simply refers to as "Stull Objectives" (the state legislation requiring that behavioral objectives be set as a part of school and faculty improvement efforts.) When he reviewed his class and his teaching strengths and interests with the principal, they agreed educationally wise choice behavior should be one of his goals. He was to accomplish it by January 1 but says he is not there yet.

7. End of Day Review and Evaluation

Time: 1:40 - 2:00

Observations: When educationally wise choice time ends Dave moves to the front of the room, observes that it is transition time and reviews the day's activities. He talks mainly about the need to make good choices in use of time. He reminds them of the problems some of them had the previous day when he gave them a list of things to do and a choice of what order to do them in.

Some students chose the "fun" things to do first and wound up coming in after lunch to finish the rest of the list. He finishes the topic by asking how many of them want to do the hardest things first. Most hands go up.

Interview: The end of day review usually takes ten minutes. The question about their use of time has taken longer. The listing of activities and student choice as to sequence came from a class discussion in which students complained of how routine the class had become. Dave reasoned that the more choices they make, the more interesting will the class be. This activity also derives from the resolution he and Cecilia made to be more flexible in their teaching.

. . . . . .

Among the support components which Dave makes use of in the activities reported are: a bilingual mother, the Spanish language skill of his aide, his team teacher, the school textbook committee, a publisher's selling strategy. The decisions he makes through which the above and other support components are employed are influenced, we assume, not only by his teaching style preference and perspective but also, we observe, by such factors as standardized tests, the achievement level of students, evaluative pressure originating in state legislation and mediated through the principal, the skill of his team teacher in demonstrating and recommending the value of a particular classroom management strategy, the ability--and opportunity--of his pupils to articulate discontent.

His ranking of major factors affecting his classroom decisions and procedures is as follows:

Inservice Education----------1

Colleagues----------2

Student Characteristics----------3

Principal----------4

Curriculum Materials----------5

Other (U.S. Navy & being a parent)--6

Central Administrative Staff--------7

Professional Education----------8

He cites workshops and programs in Math, Physical Education, and teacher effectiveness training as the most influential of inservice education. Teacher effectiveness training, commonly referred to as PDPIC (Professional Development Program Improvement Center) is an inservice training program used by all school districts in the county.[4]

The support components Dave uses and the decisions themselves vary in the degree to which they are or appear to be embedded in a system. On a "randomness-system" continuum the Spanish instruction appears to be the most fortuitous, derived as it was from the presence of a bilingual pupil with a bilingual mother with strong feelings about first language maintenance. In contrast the most comprehensive and intricate system of which he and his decisions are a part is that exemplified in the "Stull Objectives." One can find and/or construct from Dave's teaching experience other systems or sub-systems. Further discussion of this line of inquiry will come after the activities of the other two teachers are delineated.

Cecilia Bancroft

Cecilia Bancroft, age 29, is married and has a one month old baby boy. Cecilia was born and raised in southern California. After graduating from high school she entered a community college and received an Associate Degree in Education. She continued her education at one of the California State University campuses where she received a B.A. in American Studies and completed requirements for an elementary teacher credential. After her first year of teaching in a southern California community she moved to the central coast area in 1978, was employed by the La Vista District and assigned to Willow Creek School.

1. Self-selected Reading

Time: 9:30 - 9:45

Observations: A reading lesson has just been completed. Cecilia points to the list of the day's activities on the front blackboard and tells the class the next fifteen minutes is for "self-selected reading." The pupils have reading materials at hand or they choose a book from the classroom bookshelves in one corner. They read for the next fifteen minutes. The room is quiet. Teacher and aide confer about the next lesson and organize materials for it.

Interview: She says the activity builds interest in reading. Last year she had this group of pupils engage in self-selected reading, typically for 30 minutes each day. Their reading scores improved dramatically, she reports, and she believes there is a correlation. She first heard about the activity two to three years ago but she doesn't remember where or from whom.

2. Writing and Self-assessment

Time: 9:45 - 10:00

Observations: She tells them to put away their books and then points to the blackboard and reads the following: "Write a paragraph on your behavior during Feb. 2, 3, 4 (She was at a conference.) What did you do that showed

responsibility and independence? What could you do to improve and be the most independent?" The pupils take out paper and pencil and commence writing.

Interview: She has, she reports, worked hard with this group on behavior which reflects independence--and wants to see how well they do in identifying such behaviors. This class, she observes, is an "alternative" class which means its characteristics require emphases different from "normal" classes. She focuses on growth in the affective domain. So "the basic curriculum is affective types of activities--to bring about increased self-esteem, self-concept, and awareness that they have responsibility for what happens to them and some control over it." The decision about this type of curriculum evolved through discussions between the principal and Cecilia. She says she was tired of the routine she had been following and wanted to try something that would get more children involved. The method she uses derives specifically and directly from PDPIC. She says what is being tested is the point of view that children can learn as easily in the affective domain as in the cognitive domain. One "can teach decision-making just like math."

3. Independent Class Meeting

Time: 10:24 - 11:00

Observations: The class has just come in from recess and settled down at their desks. The student teacher is working with them on a writing assignment. At 10:24 a.m. Cecilia says to them, "Clean off your desks and sit on the floor." They proceed to the back of the classroom where there is an open space regularly used for class meetings and other activities which do not require desks. One boy starts the meeting. It turns out he is one of two "Public Relations Officers" in the class, elected by the class but subject to removal by the teacher if their behavior is unacceptable. The boy asks them what they want to talk about.

Two students respond but no one supports their suggestions. The group is quiet. Finally the boy in charge says they will talk about their behavior when they had a substitute teacher. Cecilia, the aide, and the student teacher stand just outside the classroom at the door, listen, and comment to each other. The pupils discuss their behavior and rate themselves, e.g., "I was a 9;" "I didn't cause any trouble and was on task most of the time." At 10:32 Cecilia walks in to admonish a pupil who was talking to a friend. At 10:35 she returns again and takes charge. She says: "This has been an independent class meeting. How did you behave? Share with the person next to you." They do and then Cecilia asks them for their evaluations. Pupils report the following good behavior: "eye contact, listening, being respectful, sitting up straight." They talk further about how they ought to behave in such meetings, and she tells them what she thinks of their behavior. At 10:43 the second phase of the meeting begins. Adults leave the room as before, and the Public Relations Officer asks for further evaluation of behavior. The discussion continues for approximately ten minutes and then Cecilia returns, reviews their behavior during the second phase of the meeting, and sends them back to their seats.

Interview: The writing assignment the previous period was intended to provide a focus for the class meeting, and the linking of the two activities was also designed, she says, to improve their ability to make smooth transitions from one activity to another. The discussion and evaluation was to give them a chance to "give themselves strokes" for good behavior and to learn to discuss and face up to unacceptable behavior.

4. Preparing for Field Trip

Time: 11:00 - 11:25

Observations: Following the above activity, when the children are settled in their seats, Cecilia begins talking about paying attention to class rules for a field trip. She writes on the board:

1. Stay on the sidewalks.
2. Obey class rules.
3. When passing, say "excuse me."

The pupils write the rules down, and then she talks to them about why the rules are important. She has them role play #3.

Interview: She says the rules have evolved through previous field trip experiences but have not changed much and generally represent necessary constraints and expectations.

5. Extra Time Before Field Trip

Time: 11:30 - 12:00

Observations: The scheduled departure for the field trip is postponed 30 minutes. Cecilia tells them they can have five minutes of "educationally wise choice time" and then they are to go to work on assignments they have not completed. The pupils proceed with a variety of activities: reading, drawing, cleaning out their desks. At 11:40 she tells them to start work on assignments.

Interview: Educationally wise choice time is a useful activity for a number of reasons including when there occurs an unexpected break in planned activities. It is, she says, a nice "sponge" activity.

6. Critiquing the Student Teacher

Time: 9:10 - 9:35

Observations: The student teacher is in charge of the class for a language arts lesson. Cecilia is today using this activity as a focus for her critique of his teaching. The student teacher calls the class to the floor in the back of the room. He reads a humorous poem and then encourages the children to select a poem from the two books he is passing around and read it out loud. Poems are read and reactions to them elicited. Cecilia sits and watches, takes notes, moves about the room getting ready for the next lesson.

Interview: Cecilia says, "I watch to see how well he (the student teacher) uses the behavioral skills he has to get the pupils on task as soon as possible, how he interacts with kids, how what he does facilitates learning or hinders it, how well he uses reinforcement tools such as a smiling face (drawn on the blackboard with the student's name beside it), and so on. Then I talk to him about my observations and notes. In a way I interact with him the same way I do with pupils. 'Here are my objectives; here are some alternatives; you generate alternatives; go ahead and we'll talk about how it came out and what might be done next time to make it better.'" She adds that some of her own instructional objectives are affected by working with a student teacher and an aide. For example she says she feels she "is ready to move to an intermittent reinforcement schedule" with her pupils but observes it will not be easy because the student teacher and aide influence behavior with their own patterns of reinforcement.

7. Desk Changing Time

Time: 1:20 - 1:28

Observations: Cecilia tells the class to clean off their desks. She continues: "It's clear from your body language that you want to get some business done. So we'll take up desk changes. Go to the one you want and

stand by it if no one else is there. If you want to keep the one you have just stay there." Approximately two-thirds of the class move to other desks. There is no contention over a single desk. Cecilia says: "Now that you have chosen desks, what are the behaviors necessary to moving your desks?" They talk about needing to do it in an orderly, quiet manner. She tells them to go ahead and move.

Interview: She says she has been doing this "forever." Among students there is, she feels, a real sense of ownership of space. "As friendships develop, they find they get certain benefits by being in certain spaces. If a pupil is in the back, he sometimes sees advantages in sitting in the front." They can make a change every month, and she reports no pupil has stayed in the same seat for the entire year.

. . . . . .

Cecilia's ranking of factors affecting classroom decision making follows:

Inservice Education----------1
Student Characteristics----------2
Principal----------3
Colleagues----------4
Professional Education----------5
Curriculum Materials----------6
Central Administrative Staff-----7

She ranks inservice education as the most important factor affecting her classroom procedures. She has taken, she says, many inservice training workshops offered throughout the school districts in which she has taught. Most of them were "worthless" and had no affect on her teaching. "However,

two became the basis upon which my entire professional skills are based, 'Assertive Discipline' and 'Essential Elements of Instruction'." The other factors "dramatically influenced" her teaching at one time but now have little direct effect. She observes their effect is felt more before and after classroom activities, e.g., parent conferences, teacher morale, and the like.

Among the teachers observed and interviewed Cecilia is, it should be clear, the most involved in and committed to a well defined instructional system, one that has been disseminated through the state funded Professional Development Program Improvement Center, one that is heavily influenced by behaviorism and Bloom's taxonomy of educational objectives. While some of her decisions fall outside the system and are functions of history and a kind of random, pragmatic experimentation with different procedures, most of them derive from PDPIC. Her commitment has led to her being designated a PDPIC trainer. She now conducts workshops on the system.

Robert Armstrong

Robert Armstrong, age 53, is married and has three children. He was born and raised in Colorado. By the time he completed high school his family had moved to California and settled in La Vista. Robert began his college education at a university in the southwest but after two years transferred to the state university campus at La Vista and finished there with a degree in education and an elementary teaching credential. His first teaching position was in the La Vista District. He has been teaching in the District 22 years.

1. Reading

Time: 10:10 - 10:35

Observations: Robert calls the class to order after they have come in from recess. He reads off the following reading group assignments written on the board:

Awards: Meet with me on Comprehension Questions and Answers, correct ditto sheets 32, 48, 49-50. Check workbook pages 46-47. Begin Unit 17 (pp. 227-228). Answer comprehension questions.

Banners: Meet with coach (Robert's aide is a coach).

Beacons: Hand out Comprehension Questions and Answer sheet. Do language and reading exercises on p. 16 and ditto on p. 34.

The groups are named according to the graded reader each uses. Robert gives final instructions to the Beacons group which will remain in the classroom. He takes the Awards group into the cafeteria but the classroom door is open, and he can monitor the behavior of the group left behind. Only four pupils are presently in the Beacons group. When the Awards group is settled at a table he hands out worksheets and asks them if they have questions. Then he proceeds page by page to discuss what the main "message" of each paragraph is. He tells them to reread the material so they can do the worksheet better. By 10:35 all the pupils are filling out the worksheets.

Interview: The interview begins at 10:35. The pupils are at work and Robert is ready to talk to me. He says that when it comes to taking student characteristics into account in planning classroom activities, he prefers to start each year as a clean slate. He tells the pupils he is not interested in what they did last year and doesn't think such information should predetermine what he should do the next year. He notes this is the best class he has had in seven years. The pupils are more motivated. They learn rapidly through reading so he does less lecturing and gives them more reading assignments. He feels the reading program which the faculty is piloting is "very cumbersome and time consuming." One needs, he says, all day for it; it is difficult to keep it all together, and it takes considerable preparation each day. The reading program last year ("formula phonics") was simpler, but the faculty decided to try the new program, partly he feels because not enough time had been taken to train them on the old program.

2. Science Test and Use of Computer

Time: 11:10 - 11:55

Observations: Robert tells students to take out science texts and see if they have any questions on the pages for the test. There is one question. He then gives them ten minutes to review. At 11:21 he writes on the board the following:

> How long will it take you in a spaceship from the earth--to go to Jupiter if you travel at the speed of 25,000 miles per hour?
>
> To do this you have to know:
>
> A. Distance between earth and Jupiter.
> B. Final group of 25,000 in this distance.
> C. Convert to largest units possible.

He hands out test sheets and they commence. Then he goes to the micro-computer on a shelf along a side wall and activates the program for converting miles to kilometers. When the pupils arrive at that part of the test that requires the conversion, they step over to the computer to get the information. Some do it with no difficulty; others have to be coached by Robert who is seated next to the computer.

Interview: Robert says he doesn't want too many computers in the classroom because he believes they are too inflexible. He thinks he could manage three to five more. Since he is experimenting with a number of programs, it is a very burdensome process, but it has also become a "tremendous time-saver," especially the "math" program he has written which he feels has already saved him several hundred hours of grading. Robert says the presence of the computer in the classroom and his use of it thus far has not changed his teaching decisions or procedures very much--and won't until he can determine a more efficient way to deal with it. But with the programs he is using he can, he says, "get to a lot more kids in a much shorter time."

3. Use of Computer to Report Weekly Grade Point Average

Time: 1:00 - 1:30

Observations: The class comes in from the playground after lunch. When they are seated and quiet, Robert tells them the next half hour will be used to make out reports on their grade point average for the week. He hands out cards and tells them to write down the following subjects: math, spelling, science, social studies, and language. He then designates the order in which each pupil is to go to the computer and "run their cards" to find their GPA for the week. When this process is underway, Robert begins reviewing the test they took the previous day on a unit about Latin America. At the end of the

review he tells them if they didn't pass the test they are to take it home, have their parents sign it, and return it the next day. The activity is completed at 1:30.

Interview: Robert says that normally he wouldn't provide parents a weekly report on grade point average, unless a parent requested it. He estimates it takes him approximately two hours to put all GPA's into the computer. He usually completes the task during noon hours or when the class is out for physical education. He retains the cards for parent conferences. He observes that for pupils who are having problems the cards serve to bring parents in almost immediately, long before the scheduled conferences each quarter.

. . . . . .

In addition to a math unit and grade point averages, Robert has developed programs for use by students in the following areas: spelling, science, social studies, parts of speech, and number of books checked out. He also puts into the computer weekly monitor assignments (distributing materials, straightening up the room, etc.). To use the computer for this purpose, he says he has to make the assignments himself. So the computer is becoming for him an increasingly important support system, the characteristics of which affect the kinds of instructional decisions he makes. It may be that to some degree the use of this support system is a function not only of his interest and expertise in electronics but also of a compatibility between his preferred mode of instruction and the organization that is required to make use of computers. Under any circumstances, the factors he ranks as most important in making decisions have an immediate relevance to the instructional use of computers:

Student Characteristics----------1

Curriculum Materials----------2

Principal----------3

Inservice Education----------4

Central Administrative Staff-----5

Colleagues----------6

Professional Education----------7

It is tantalizing to conjecture whether or to what degree these rankings--and those of Dave and Cecilia--reflect at least an implicit interest in utilizing support systems (as opposed to discrete support components). Robert does not rank inservice education as high as the other two teachers. His use of a (technological) system derives from a longstanding interest in electronics. Dave and Cecilia name inservice education as the most important factor and identify what can be legitimately thought of as instructional or (in Cecilia's case) class management systems as the bases for the ranking.

Data from Other Schools

Fourteen teachers were observed and interviewed. In the previous section, I presented data on three of them. In this section, I will draw from data on the remaining eleven teachers and present in item form representative examples of decision making and support component use.

-Reading materials from the school resource center are often used.

-A student is chosen as a "special person" for the day, a schoolwide practice that grew out of faculty discussion.

-A paragraph correction idea was obtained from a colleague.

-Selection of spelling words is linked to drawing pictures of stories. Idea came from daughter whose teacher was doing it.

-Playing music during transition from one activity to another was suggested by a colleague.

-Published material on self esteem has influenced "entire outlook."

-Makes extensive use of materials from educational supply house, workshops, etc. to supplement texts.

-Spelling words come from the district.

-May change plans if the weather is inclement or if she feels bad, has a headache.

-Self-selected reading was suggested by principal.

-Student input about likes/dislikes are used in adjusting plan.

-Math time test is a schoolwide practice.

-Use of "mother helpers" during reading came from a volunteer mother.

-Uses a discipline technique learned in an inservice session.

-Utilizes Red Cross in health program.

-Uses cross-age tutors as requested by TMR teacher to aid mainstreaming.

-Uses husband's ideas--who is also a teacher.

-Teaches math, language, and reading in the morning because research shows children learn more easily in the morning.

-Student teaching experience taught her about available resources.

-Uses materials from travel agencies with units on different countries.

-Uses games she learned at home as a child.

The types and variety of support components represented in the above list are what one might anticipate: colleagues, mandated district curriculum, commercial publications, public and private institutions, workshops, principal--and, more personal--spouse, daughter, family tradition. As a total group (12 of the 14 teachers responded to the questionnaire) teachers in this study rank student characteristics first and curriculum materials second as factors influencing how they proceed in the classroom. Their rankings follow:

Student Characteristics----------1

Curriculum Materials----------2

Inservice (non-degree) Education----3

Colleagues----------4

Principal----------5

Degree Professional Education-------6

Central Administrative Staff--------7

When asked to express their feelings concerning the influence of non-professional education factors, the following comments were made (years of experience are indicated at the close of each comment):

> Nature of student population is the most important factor. Decisions have to be made to meet their individual characteristics and needs first. Ideas borrowed or "stolen" from colleagues are not frequent but have provided a great source for a few major decisions on how my program functions. (11 years)

> I think after you know what is expected in your district, curriculumwise, it's the students and their interests which shape what you do--plus your own creativity to better do the job at hand and make it interesting and exciting. A supportive principal is great, but it's still your own goals and expectations of yourself that are most influential. (36 years)

> My master teacher's influence was felt most heavily in the first six years. My partner in the second year was also influential. My principals have had little knowledge of (the grade I teach) and so were not influential. PDPIC has been very influential in classroom organization and lesson design. (11 years)
>
> Students, parents, professors, principals, and friends have all stressed a need for creativity in teaching and learning. Most of my education classes dealt with meeting individual student needs and motivating students. My principal and colleagues are very supportive in trying new ideas. (4 years)

Teacher comments reinforce the choice of student characteristics as the most influential factor in instructional decision making. But student characteristics are a condition affecting decision making rather than a source of support materials or ideas. The remaining factors represent sources of support materials and ideas, and among these curriculum materials are ranked the most important and inservice education the second most important. Colleagues, principal, professional training, and central staff are ranked lower. It is through inservice education that the most significant (from the teacher's point of view) system-like innovations have been introduced.

Discussion

Teachers bring to their pedagogy varying predilections, convictions, biases, and uncertainties about scholastic achievement, social behavior, learning characteristics and other facets of classroom life. Whatever "world view" a teacher has, there is typically a kind of elementary pragmatism underlying decisions about instructional activities. Indeed, I think it is fair to say that an ambitious teacher is likely to be an astute and imaginative scavenger who regularly sweeps his/her occupational environment in search of the workable. Research on teaching and teachers provides ample evidence of a practical orientation, and data from this inquiry represent no exception. Support components identified--and utilized--by teachers to affect change, innovation, elaboration, are drawn from a great variety of roles, documents, and organizational arrangements.

As to the linkage between decision making and support component selection and use, it may be of little consequence to practice whether the use of a particular component originates in, say, a chance encounter with a former colleague or is the end result of a deliberate, systematic search by a teacher for ways of improving an aspect of the instructional program. But we may assume that differences in "history" do have consequences for the teacher--in the sense that a successful planned change (as opposed to fortuitous change) has a more salutary effect on a teacher's self-esteem and sense of professional competence. I find in the interview data some evidence of such an effect.

The basic interest of this study is not in discrete support components but rather in support systems. The questions I asked at the outset included the following: Do support systems exist? That is, are there regularized,

interdependent connections among a group of support components which hold over time and which have import for instructional processes? If such systems exist, do teachers think of them, and make use of them, as systems? If they do, what implications does the use by teachers of "systems" have for modes of intervention to improve education? The answers I have are tentative.

First of all, the question are there social/organizational phenomena observed in this study which can legitimately be subsumed under the concept system? I consider the following to be examples of systems:

1. PDPIC: Among phenomena encountered the teacher effectiveness training program adopted by the county represents in my judgment the most articulated support system. It is essentially an instructional system with behavior-oriented objectives, training procedures, and observation/evaluation criteria.

2. Microcomputer, programing and use: One can view the computer even in an inert state as a complex technological system. When it is activated through a program--and that program is utilized by a teacher and/or students--it becomes an instructional system with a complex and intricate set of interlocking expectations, requirements, procedures, and outcomes.

3. "Stull Objectives": The "behavior objectives" teacher improvement system sanctioned by state legislation and mediated through the district and the principal is, like PDPIC, a system that is vertical in configuration, running from the state legislature down through the various administrative/institutional levels to the teacher. The microcomputer system is more horizontal in configuration. Robert Armstrong runs workshops for his colleagues, and the district is expanding the use of computers in the schools.

The above phenomena lend themselves to classification as systems. They are, in the first instance, sufficiently complex, and they make unavoidable demands

on participants. System characteristics include the prospect that when one opts for--or is co-opted into--a system, a measure of professional autonomy is at least temporarily sacrificed, presumably to improved pedagogy.

There are other systems, but of lesser complexity--for example, team teaching (David and Cecilia), the textbook selection process, "assertive discipline." Compared with the first three they represent a middle level of system complexity, although team teaching if pursued thoroughly by two individuals can be immensely complex. Middle level systems may, depending on their use, function as subsystems or adjuncts to a system. It appeared to me that "assertive discipline" served such a function for Cecilia--as an adjunct to her implementation of PDPIC. One might expect that systems which co-exist within a single institution would be in a dynamic relationship with each other, interacting, overlapping, producing modifications in system components. Dave Elliott's employment of "educationally wise choice time" was in a real sense the product of the convergence of three systems. The idea came from his team teaching partner, Cecilia, who had incorporated it into her version of the PDPIC instructional system. Dave's interest and motivation to initiate the activity derived in part from the Stull Objectives.

In this discussion of systems I am excluding curricular systems, e.g. graded readers, math, language arts, social studies, and the like--although they have all the attributes of systems and are a powerful organizing influence on a teacher's pedagogy. I have been mainly interested in support systems and components--those post professional education increments or additive elements which teachers incorporate into their pedagogy and which they perceive as instrumental to improved teaching. In summary, I extrapolate from the data the following observations:

1. Support systems are complex social/pedagogical phenomena.

2. Their dissemination is most appropriately affected through teacher participation in direct, formalized inservice education programs.

3. Given the complexity of systems, their introduction and implementation require or at least are frequently accompanied by a coercive factor, e.g., state legislation and funding prescriptions, district or school policy, the criteria for performance evaluation.

4. Support systems are both liberating and constraining. They provide answers to questions, solutions to problems, teaching-learning formats, modes of behavior analysis, strategies, scenerios, dramas. By definition and operation a support system presents new alternatives and excludes other possibilities.

5. As comprehensive as a system may be in delineating a workable pedagogy, teachers do not gravitate naturally to systems. An obverse corollary is that systems are not natural to classroom pedagogy. No system can account for all the variables and diversity which characterize classroom life.

6. The school principal plays a key role in mediating the introduction and use of systems.

In an early section of this report I pointed out that explanations for teacher use of support systems and components must be placed in context. At the basis of this research is a general view of schools as academic organizations with internally generated social norms, role expectations, and patterned behavior and as instruments of cultural transmission and socialization for the parental constituency and the broader culture/community. Teaching then proceeds within concentric, overlapping contexts--the classroom, the school, the attendance area, the community/school district, the broader regional-national setting. Each of these contexts generates expectations which teachers must

sort out and reconcile with the daily, ongoing demands of classroom life. Hence the efficacy of varied support components and systems must be continuously assessed within this complex, contextual setting.

Notes

1. I wish to express appreciation to the National Institute of Education for a small grant (NIE-6-81-0110) in support of this research. I also wish to thank Patti Tackett for her valuable assistance in the project.

2. Major concepts of information processing in teaching and relevant theory are also explicated in Joyce (1978). Borko's model for decision making contains the basic elements of information processing theory as applied to teaching (Borko et. al., 1979). Shulman and Elsteen are concerned with the forms of decision making that involve the processing of information to make judgements (Shulman and Elsteen, 1975). Shavelson argues that decision making is the basic teaching skill (1973) and presents a model of teaching as decision making (1976).

3. Observational notes are presented here in that level of detail which will provide the reader sufficient background for interview protocols.

4. Professional Development Program Improvement Centers is a system of regional centers established by California legislation AB920 to foster inservice programs for teachers. Each center was free to develop its own approach to improving instruction. The El Vista County Center adopted a program of teacher effectiveness training--a program derived mainly from the work, publications, and training procedures of Madeline Hunter, long time principal of the laboratory school at the University of California at Los Angeles. The Center focused on five instructional techniques: (1) Teaching to an objective, (2) Instruction at the correct level of difficulty. (3) Monitoring and adjusting student learning, (4) Applying the elements of reinforcement theory, and (5) Using the variables of motivation theory.

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QUESTIONNAIRE

TEACHER DECISION-MAKING PROJECT

1. Name _____ 2. School _____

3. Home Address _____ 4. Home Phone (___)_____

5. Age _____ 6. Place of Birth _____

7. Marital Status _____ 8. Number & Ages of Children _____

9. Ethnic/Racial Background _____

10. Education

	Institution	Major	Degree, Credential, Inservice	Year
a.				
b.				
c.				
d.				
e.				
f.				
g.				
h.				
i.				

11. Non-Degree Professional Education (Please mention specialized institutes, programs, or workshops you have taken that you believe have been particularly influential on your instructional procedures and briefly indicate in what way.)

12. Teaching Experience

School/School District	From/To	Grades
a.		
b.		
c.		
d.		
e.		

13. Non-Professional Education Factors (In relationship to the above teaching sites, would you mention any factors other than professional education, e.g. nature of your student population, collegial norms and attitudes, principal's leadership, parental intervention, which you feel were particularly influential on your teaching procedures.)

14. Would you rank, please, the following factors according to what you believe to be their relative influence on how you proceed in the classroom. Assign a number to each with one (1) for most important.

Factor	Rank
Colleagues	____
Principal	____
Student Characteristics	____
Degree-Professional Education	____
Non-Degree Professional Education	____
Central Administrative Staff	____
Curriculum Materials	____
Other_____	____

15. If this questionnaire has in some way overlooked a factor that is important to decisions you make about instructional processes, I would appreciate further comments below. Thank you.