DOCUMENT RESUME

ED 201 674 TM 810 271

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TITLE Classroom Ethnographic Study of an Activities-Based Supplemental Mathematics Program.
SPONS AGENCY National Inst. of Education (ED), Washington, D.C.
PUB DATE Apr 81
GRANT NIE-6-80-0090
NOTE 47p.; Paper presented at the Annual Meeting of the American Educational Research Association (65th, Los Angeles, CA, April 13-17, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Case Studies; *Classroom Observation Techniques; *Classroom Research; Compensatory Education; Economically Disadvantaged; Elementary Education; Elementary School Mathematics; *Ethnography; Grade 3; Grade 5; Instructional Improvement; Low Achievement; Minority Group Children; *Models; *Program Evaluation; *Program Implementation; Resource Teachers
IDENTIFIERS *Elementary Secondary Education Act Title I

ABSTRACT

An ethnographic approach to the evaluation of an Elementary Secondary Education Act Title I mathematics project designed for grades 3 and 5 low-achieving students is described. The research was designed as a series of eight disaggregated single case studies of the implementation of the project with the classroom serving as the unit. The focus of the study was the development of ethnographic procedures for observing and describing the way programs are implemented using resource teachers to help classroom teachers improve instructional services for economically disadvantaged minority students. An ethnographic model for use by school district evaluators in studying program implementation was developed. (Author/RL)

Classroom Ethnographic Study of An Activities-Based Supplemental Mathematics Program

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Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, California, April 13-17, 1981; (Session 25.25). This research was supported with a Grant from the National Institute of Education (NIE-6-80-0090); however, no endorsement by the Institute is implied.

The author gratefully acknowledges the invaluable contributions of Lisa Leiden, Barbara Markert, Peggy Placier and Judy Walters who served as ethnographic assistants for the project.

A B S T R A C T

This study describes an ethnographic approach to the evaluation of a Title I Mathematics project designed for third and fifth grade low-achieving students. The research was designed as a series of eight disaggregated single case studies of the implementation of the project with the classroom serving as the unit. The focus of the study was the development of ethnographic procedures for observing and describing the way programs are implemented using resource teachers to help classroom teachers improve instructional services for economically disadvantaged minority students. An ethnographic model for use by school district evaluators in studying program implementation was developed.

Classroom Ethnographic Study of An Activities-Based Supplemental Mathematics Program

Recently there has been a trend away from exclusive reliance on traditional social science models in educational evaluation because they apply to only a small proportion of questions and are rarely practicable in the natural environment of the public schools (Scriven, 1978; Cronbach, 1978; Guba, 1978; Stake, 1978; House, 1977). Guba (1978, pp. 79-80) in writing about a practitioner movement towards naturalistic inquiry in educational evaluation, has stated a need ". . .to enlarge the arsenal of investigative strategies available for dealing with emergent questions of interest; to provide an acceptable basis for studying process; to provide an alternative where it is impossible to meet the technical assumptions of the experimental approach in the real world. . . " Further, naturalistic or qualitative approaches have been seen as a way to meet the growing demands for evaluations that can be utilized in generating recommendations for improving program effectiveness (Alkin, Daillak, White, 1979; Patton, 1978). This present study was an outgrowth of the limitations of the control group model of the current Title I Evaluation and Reporting System to provide sufficient information for decisionmaking (Slaughter, 1980).

Naturalistic inquiry is defined by an approach used when the researcher designed the study to fit the situation and answer social policy issues that often cannot be examined by altering the situation. Ethnography is a type of naturalistic inquiry where a trained observer attempts to describe a social situation as it functions naturally. As stated by Fienberg (1977, p. 52), "Rather than assess the effectiveness of teaching by traditional techniques of test scores administered before and after some 'treatment,' the ethnographer chooses to investigate how events within the classroom and the interactions between teachers and students affect the learning process. This view of the basic inquiry has led ethnographers to the method of direct observation (most typically nonparticipant observation) for data collection." Ethnographic methodology, using trained observers of holistic behaviors of students, teachers and others (and patterns of relationships among them) in school settings has seemed especially relevant to understanding educational practice. Tikunoff and others (1975) developed procedures for integrating shorter term ethnographical observations with other types of data to increase our understanding of classroom instruction and student learning. Johnson and Gardner (1979), suggested some first steps in developing a prototypic model for training ethnographic assistants to work with research staff to fulfill fieldwork commitments in conducting a classroom ethnography of reading instruction.

The objective of this study was to conduct an in-depth classroom implementation study, using ethnographic methods, of a supplemental Title I mathematics project. The focus of the study was the development of procedures for observing and describing the way programs are implemented using curriculum specialists or resource teachers to help teachers in the regular classroom to improve instructional services for economically disadvantaged minority students. The ethnographic approach used also addressed questions arising in practice and in the research literature about the mathematics learning of low achievers in an instructional program using manipulative aids, that are related to the improvement of compensatory education programs.

The Evaluation of Resource Teacher Programs: Related Literature and Research Questions

Programs employing resource teachers in specialized areas have been one way that administrators have attempted to improve classroom curricula and meet the special needs of individual students. This is one way that scarce resources can be extended to benefit a larger number of students than would be possible through provision of teachers giving direct services to children on a daily basis. Resource teachers' assistance within the classroom is a "mainstream" approach to compensatory education and may have advantages over pullout programs (Glass and Smith, 1977). One such advantage may be articulation of the resource teacher's program and the ongoing classroom program. Empirical research was needed to affirm or disconfirm this speculation.

Unfortunately, the complex organization required for resource persons to effectively assist teachers in improving the instruction of low-achieving students in more than a superficial way remains a problem. For instance, Milofsky (1974, p. 439) described the problems of managing school politics in supplemental programs and the chronic problems of resource teachers in gaining access to regular school personnel and priorities. Harry F. Wolcott, (1977, p. 243) in a study which focused on the social organization of an educational innovation stated, "Too many researchers have. . .been too attentive to innovations and too inattentive to how educators organize to cope with them." The need for research that takes into consideration the process of mutual adaptation of the implementors of an educational innovation and the users, e.g. teachers and students, was pointed out by Fullan and Pomfret (1977).

There has been a need for observational research studies on the actual implementation of the resource teacher service delivery strategy in practice in naturalistic settings from a user perspective. An observational study is particulary appropriate since the introduction of resource teachers into the regular classroom implies role changes for classroom teachers, students, and resource teachers. Fullan and Pomfret (1977) indicated that a main problem of implementing

new curricula is that curriculum change often means that new role relationships are required of persons putting the innovation into practice. Research on the use of manipulative aids in teaching mathematics has shown that the teacher effect is overwhelming (Suydam and Higgins, 1977).

There is no way an apriori system of observational categories would validly reflect the interaction of classroom teacher, Mathematics Specialist and students for understanding the implementation of this type of program. Even tightly controlled studies of teacher effectiveness have found preset categories in observational instruments were not always appropriate for an evaluation of an intervention (Stayrook and Crawford, 1978).

Naturalistic observation was especially appropriate to the fluid situation of nonresearch-based compensatory education projects. However, observation is always selective (Spradley and McCurdy, 1972) and must necessarily be focused in ethnography used for evaluative purposes. According to Erickson (1977, p. 62), "Focused data collection. . .required knowing something about the setting one is studying through information gathered before entering the setting as well as from first hand experience." The apriori research questions guiding focused observations during the study are listed below. This list is illustrative only, not exhaustive, since many more research questions arose, as expected, during the study. One of the purposes of qualitative research is to generate hypotheses. Examples of questions used in focusing observations were as follows:

1. How do the resource teachers, i.e., the Mathematics Project Specialists, establish rapport with classroom teachers and children?

2. What are the opportunities and for how long are classroom teachers able to observe the demonstration lessons in the regular classroom context?

3. Does the classroom teacher make some special arrangements to provide space, time, different groupings of students, and activities for nontarget students during scheduled demonstration lessons?

4. How does the focus and content of demonstration lessons vary with type of classroom, composition of target group, cooperation of classroom teacher, etc., from one site to another?

5. What is the percentage of mathematic manipulative activities to other kinds of mathematics instruction in the classroom? Does this change after the demonstration lessons?

6. Are the demonstration lessons coordinated with the regular mathematics program received by the target children?

What kind and what degree of guidance is given to students during the manipulative phase by Mathematics Project Specialists and by classroom teachers?

3. Is there evidence of transfer of concrete manipulations to symbolic records during the observation period?

Design of the Study

This study reports some emergent findings from a series of eight disaggregated single case studies of the implementation of a supplemental mathematics project with the classroom serving as a unit. Kennedy (1979) related the importance of the single case study approach for documenting the effects of treatment and also the reasons for these effects. Carrying on the study at multiple sites shows how the treatment functioned for different recipients, both students and teachers, in different contexts. According to Kennedy (1979) generalized statements regarding program effects are of limited validity because of the wide variation in treatments, intervening influences and extenuating circumstances in implementation. Attempts to clearly define any single program treatment and its affect upon achievement is further confounded when students participate in several programs including the specific program ongoing in the regular classroom. Statements of program effects in terms of gains scores aggregating student pre-posttest means across classrooms and schools are only meaningful to the extent that program implementation is uniform.

This study, while primarily ethnographic in approach, was conceived as analogous to an ABA time series design in psychology, as described by Kratochwill (1978, pp. 41-42), in that it incorporated measurement of baseline conditions, measurement during the intervention phase and measurement after the intervention was withdrawn. However the context of this study was very different from the typical experimental study in that the "intervention" itself was in need of verification. While it was assumed that during the intervention process the dependent variables would be improved, i.e., student involvement and success on mathematics tasks, the point of the study was to see if there was improvement immediately after the treatment and to determine the length of time of treatment effect. Further, if the treatment successfully improved the mathematics performance of the target students, there would not be a return baseline condition. According to Kratochwill (1978, p. 42), "This mitigates against the logic of the design and would not allow investigators to establish experimental control." In a naturalistic inquiry of this sort, experimental control is neither attempted nor is it necessary. The ethnographic approach was highly appropriate since it could be used to provide information about a program that, since implementation did not follow a preset plan, could not have been evaluated using an experimental model.

Classroom Observation and Data Collection

This section contrasts the preplanned and actual research agenda for conducting and writing up ethnographic observations. This is done to assist others in planning ethnographic evaluations.

Planned Research Agenda. During the first series of demonstrations in the fall of 1980, three ethnographic assistants will observe three different classrooms for a period of one month. The principal investigator will observe at least four times in each classroom participating in the study. Narrative records of the observations will be typed daily. The typed records will use code names for participants observed.

The observation plan is as follows:

1. An ethnographic assistant knowledgeable about the mathematics curriculum will observe the mathematics target students for one week prior to the demonstration lessons. The observer will know who the target students are and will make narrative records on what happens to them during the mathematics period. This will include records on what the teacher is doing.

2. The observer will watch the mathematics demonstration lessons of the systematic use of one or more manipulative aids and make narrative records of the teaching strategy used, the target students' responses, indications of the regular teacher's observations of the lesson and any other pertinent factors, such as what the remainder of the class is doing at this time.

3. The observer will be in the classroom for the next ten school days following the demonstration lessons. Records will be kept of the activities of the teachers and target students during the mathematics class and the students' responses to it.

4. Once a week, or more if necessary, the ethnographic aides will meet with the principal investigator to discuss the observations and any problems in carrying out the study.

The above plan will be repeated for a second round of demonstration lessons in three different classrooms later in the year. Later, two more classrooms will be observed. Consultation with teachers, Mathematic Project Specialists and district curriculum administrators will supplement and enlarge the scope of the study.

After the initial series of observations are completed, the data will be compiled into a preliminary report. At this time, procedures for simplifying the observation--data collection process--

will be explored. For instance, a format for reporting data back to the principal investigator after observations, will be developed if possible. Then more highly focused observations will be used for conducting observations in three more classrooms at midyear and to more classrooms later in the spring. One observer will return to the first classroom observed to provide a longer view of the treatment effect on students.

Actual Research Agenda. Three ethnographic assistants were trained in late September and October and scheduled observations over a month's time in three target classrooms and in one other classroom where the teacher was team teaching with the teacher in a target classroom. As seen in Table 1 (Appendix A) fewer observations by either the principal investigator or the ethnographic assistants occurred than originally planned. Observations were planned for a maximum of four days a week to allow the teacher breathing space of one day without observers and school activities such as Halloween Parties, teacher absences, etc., further reduced the observations. We felt that the number of observations made were sufficiently representative of classroom activities during the observation period. Principal investigator observations were reduced due to the time required in the human relations context of establishing the study in the schools and coordinating the research with actual instances of program implementation. It should be noted that after this was accomplished, in the fall, scheduling later observations in the remaining five research sites was much smoother. Principal investigator (PI) observations served the purpose of (1) maintaining contact with people in the field, (2) providing opportunities for developing shared perspective and dialogue between the PI and ethnographic assistants, and, most importantly, (3) providing direct experiences within each research site to the PI which proved indepensible in developing theories about implementation and for further focusing observations. One method of focusing the ethnographic assistants observations was for the principal investigator to provide example protocols developed from observations in the research site classrooms.

Narrative reports, also called protocols, were not typed daily. We found that each hour of observation required a minimum of three hours writeup time. While ideally each observation should be written up before succeeding observations, this was not always possible. A form was developed (see Appendix B) for handwritten protocols.

While initially we had planned one week of observations before the intervention and two following it, we found it preferable to spend two weeks in the classroom before the intervention occurred. This was necessary to ensure the correct identification of students and familiarity with the classroom routine. Learning students names and correctly identifying target students was more difficult than we had expected. This was probably due to the nonparticipant nature of the observations.

Primary observations were focused upon the classroom setting as a sociocultural unit, not individual target students. Gump (1980), from the perspective of ecological psychology, suggested that one needs to observe the setting unit first and stated, "One has to assume a different observational stance for settings." Observations of settings are more difficult to focus because of the wide choice of co-occuring events or episodes, especially in multi-task, small group, organized classrooms. However, since classroom episodes last longer, e.g. 20 to 30 minutes, or more, than individual behavior patterns, observers can often collect data on both settings and individual behavior (Gump 1980; 1974). It is especially important to observe settings over time and to extend observations through collaboration with classroom teachers.

According to Gump (1980, p. 14), information about settings is indispensible in studying implementation:

> A description of a setting, independent of subjects' behavior is required. The systematic observation and the quantitative description of settings, as opposed to individual behavior, would seem to be a useful, even necessary skill. . . Many of the interventions to be evaluated involve settings: Classrooms, office, staff-development workshops, teachers meetings, playgrounds and so on. Problems to be solved often appear in such settings; interventions are often applied in such settings, impacts of such interventions need to be examined in such settings. For some problems, the impact of intervention creates setting changes which then change individual behavior and experience. In fact, without a sturdy and comprehensive setting change, many interventions will be impotent.

Our perspective throughout the data collection phase of the study has been to pay attention to the classroom unit while moving from group to group, especially those containing target children or being instructed by Title I mathematics resource specialists, to collect data on interaction among persons and responses of individual students. Methodological suggestions regarding improving the focus of observations and of protocols are found in a later section. We found that the dynamics of the interface between classroom teacher and mathematics resource personnel with negotiation of the specific form and content of the Title I mathematics services taking place during, as well as previous to intervention, obviated the possibility of using any preset or quantitative approach to observation. To have attempted to use a less ethnographic approach would have been to ignore the richness of the data and would not have been practicable.

A training program for the ethnographic assistants was planned and implemented with the assistance of consultants Dr. David Berliner, educational psychologist, and Dr. John Chilcott, educational anthropologist. The mathematics resource teachers were also invited

to participate in the training sessions. Topics discussed during training are found in Appendix C. The selection and training of ethnographic assistants is summarized in the model found at the end of this paper. The attempt to promote the development of a distinctly "ethnographic" approach to studying classroom implementation and trainee responses to it is described below by Chilcott.

Training of Classroom Ethnographers: An Educational Anthropologist's Perspective

It is no easy task to move a group of people, each with his/her own cultural experience and professional perspective, in a few short days toward an entirely new professional perspective or world view. It has been my experience that it takes anthropology students who are daily immersed in coursework several years to acquire what is commonly referred to as the "anthropological perspective."

Although reading several essays on the topic (Kimball, 1963), (Ianni, 1970) may prove useful to the trainees, it is important to keep in mind that a classroom ethnographer is severly limited in what he/she may accomplish. It became as much a task of the training sessions to make the trainees aware of these limitations so as to reduce their frustrations as to convince them of the value of anthropological research.

One purpose of the training sessions was to move the trainees from the world view of their particular professional or social science training to the world view of anthropology. This in of itself was a cultural change process since these individuals felt secure in and convinced that their training was superior to other social sciences.

It was also a task to provide the rationale for ethnographic research, a type of research methodology which is unique among the social sciences, and the goals of ethnographic method. The non-judgmental character of the ethnographic method and anthropological insights was particularly difficult to communicate since the ethic of professional education is to make judgements of good and bad pedological methods and since the purpose of the ethnography was to serve as an evaluation of a particular curricular activity.

A series of lectures and reading materials were provided to illustrate the goals of anthropology and the use of ethnographic method in acquiring cultural data. A few examples of ethnographies in nonwestern settings were provided (Geertz, 1973) with particular emphasis upon method and results in order for the trainees to arrive at an understanding of what the term "thick descriptions" connotes.

Both the emic and etic methods were explained and illustrated using examples from the research conducted by this researcher (Chilcott) in educational settings. A discussion of the

use of informants to gather additional information about observed events in the classroom followed. A practice session involving observation and the use of informants was provided through attending an inservice training session for teachers. These observations and information from informants were compared and analyzed in terms of what information was being missed and causes for the differential data among the trainees.

Other practice sessions included a taped TV sequence of a third grade classroom in which the trainees again wrote out their descriptions, compared them, and discussed what cultural data they had not seen and what cultural data was missing from the TV sequence. At this time the concept and procedures for event analysis, and the sequencing of events was introduced. It also became apparent during the exercise of the limitations of using TV data in classroom ethnography and of the need of the observer to utilize the holistic approach in understanding the cultural determinents of the sequencing process.

A sample of protocols used in previously conducted classroom ethnographies were reviewed noting their advantages and disadvantages. In order to overcome their deficiencies, the trainees were encouraged to use classroom protocols solely as a mnemonic device for later analysis and the writing of "thick" descriptions of the classroom observation. It was estimated that the classroom observers in order to become classroom ethnographers would be required to spend three to four hours of post observation analysis in order to complete the ethnographic description of a one hour observation.

It was at this point that the trainees frustration level reached its apex. They became simply overwhelmed at the task both as to its time frame and their ability to cope with a large amount of cultural data. It was necessary to reassure them that with additional experience in the day to day reality of classroom ethnography, their skills in data collection and analysis would improve immeasurably and their task would not be as overwhelming. A comparison with a corresponding time sequence of an ethnographer in the field who could easily be overwhelmed with the language, data, and strangeness of a foreign culture during the first few weeks in a village or camp, was useful at this time.

The nonjudgemental feature of ethnographic research required constant reinforcement during the entire period of training. The trainees were constantly being reminded through specific illustrations drawn from their observations of the "cultural baggage" which they were carrying which was biasing their observations. This was particularly apparent in their making judgements as to what constituted good and bad teaching. The acquired skill in making objective observations required a longer period of resocialization than had been anticipated by the trainees. Again a comparison with cross cultural ethnographic descriptions was a useful device in acquiring an objective viewpoint.

There was also a discussion of innovation and cultural change process both in terms of innovation in education and of cultural change within educational institutions with particular reference to both the new curriculum which they were observing and to ethnographic research as innovative in educational research.

It became obvious after a few training sessions, that it would be necessary to constantly reinforce the early training throughout the entire classroom ethnographic observations in order to make constant revisions of the approach and to improve the ethnographic skills of the observers. Similar to novice anthropological field workers, the best and richest ethnographic descriptions would appear near the conclusion of the study. Alternatives in the style and form of writing protocols developed over the course of the study described below was one attempt to improve the quality of the data.

Writing Protocols: Alternatives in Style and Form for Classroom Ethnography

As noted, in the initial training of the ethnographers, examples of protocols from previous classroom observational studies were used as models. The sources of the models were Cassell (1978), Evertson (1980) and Tikunoff, Berliner and Rist (BTES, 1975). While the models were useful in the development of a methodology for producing protocols to serve as a first draft of an observation, there were several problems associated with their use in this form for school district evaluative research. Admittedly, the detailed record of ongoing events was essential to the study, but the exclusive attention to detail resulted in protocols that were laborious to write and not easy to read. To be perfectly candid, they were boring and required an enormous effort on the principal investigator's part in using them as a basis for analysis. Therefore, we began reexamining the protocols to find ways of improving their readability within the parameters of our research goals of (1) producing documents that would contain rich descriptions of classroom life, (2) maintaining an impartial, nonjudgmental stance, (3) providing data which would be a source of our interpretations regarding factors related to program implementation (the learning of low-achieving students, etc.) and (4) providing a database that could be used by the principal investigator within the relatively short timeframe of evaluative research and the one-year NIE grant.

In modifying the protocols we looked at two somewhat interrelated aspects of a protocol. There were (1) format, style and the ethnographer's presentation of self within the protocol and (2) a need for a nomenclature for conceptualizing and describing phenomenon observed in the classroom.

Format, Style and the Ethnographer's Presentation of Self

Research is generally written in the past tense and mention of the researcher, if at all, is in the third person. Schollon and Scollon (to appear, 1981) would term this as the Western

essayist style which is highly decontextualized, and "the author as person by a process of writing and editing seeks to achieve a state of self-effacement." The standard research report is an example of essayist literacy as defined by Scollon and Scollon (in press):

> The ideal text is closed to alternative interpretation. It is nonindexical. Nothing outside the text is needed for interpretation. These factors have important implications for the discourse structure. The important relationships to be signaled are those between sentence and sentence, not those between speakers nor those between sentence and speaker. As reader this requires a constant monitoring of grammatical and lexical information. In spoken discourse the listener can get a good bit of the meaning from the context. In reading essayist prose the clues to interpretation are in the text itself.

Students of the social sciences are taught to use the past tense, impersonal nouns and the third person for self-referral as a way of "distancing" themselves from the research. Educational researchers and evaluators, as well as other social scientists, are accustomed to reading research written in this style. Ethnography also is usually published in this form. However, neither the protocols used as models nor the ones we were producing during the first stage of the research study were in this form. The protocols read like eyewitness accounts of processes as they were happening with the ethnographer appearing in the first person, as a quasi participant. Even though the protocols were sometimes called narratives, they weren't very good narratives according to essayist literacy or "research" standards. This may have been one reason that they were difficult to read. Looking backwards, the protocols in the Tikunoff, Berliner and Rist (1975) study were produced at first by the ethnographer tape recording from his notes and memory the observational material. This was later transcribed by a secretary into a typed continuous numbered line format. Therefore, the method of recording may have produced the narrative style of these protocols. In our study, funded under the NIE small grants program, protocols were written out (from notes and memory) by the ethnographers directly on lined paper similar to those used in previous studies. Initially this was done instead of tape recording to save time and money. However, because our protocols are written not audiotaped, the ethnographer has an opportunity to make stylistic decisions as a writer regarding the form the narrative will take. In other words, the BTES protocols were much more a first draft than written protocols necessarily have to be. The process of writing itself incorporates a kind of editing that may not be as apparent or the same in audiotaping. These writeups took approximately three hours of writing time for each hour of observation. At issue, of course, is the desirability of changes in form and the philosophical, political and theoretical assumptions and implications of these choices.

One of the goals in refining of the protocols is to create research documents that can more readily be used in evaluation. This necessitates having the ethnographic assistants produce documents that are easily used by some other reader within definite time constraints, both for the producer and the user. Furthermore, it might be desirable for the protocols to be directly used as case documents with teachers and/or administrators in certain instances without the requirement of rewriting. For instance, a relatively simple format change from the numbered linear style to one using topic headings and indented paragraphs would improve readability.

A more important change would be to use the form of a transcript such as found in sociolinguistic research for recording segments of interactive discourse as follows (Protocol 1/28/81, Study E, PI, pages 5, 6):

After speaking briefly with an adult female who came into the room, the teacher came over to the corner group and holding up the orange (10) rod asked Bill, "What's another name for this?" Although trying to answer, Bill couldn't respond with the correct answer. Then the teacher started questioning Penny using the following:

T: What is this? (White rod, 1)
P: One
T: What is orange?
P: Ten
T: What is red?
P: Two
T: How many reds equal orange?
P: Five
T: Then what is another name for orange?
P: Five-fifths
T: Okay

Mehan's research (1980) done with videotaping provided a rich description of classroom interaction that can be applied in a modified way to more traditional approaches to classroom ethnography such as found in this study. When observations include this type of data about interactive discourse, including peer group discourse, the transcript provides a quick and easy reading of the dialogue.

The protocols could also be improved if they were generally written in the past tense, with only occasional instances of other tenses such as the present tense, where it was particularly appropriate. This has been a recommendation to the EAs although the tendency still remains to present the data in an unanalytical, eyewitness account. Written narratives found in literature or other descriptive writing, including ethnographies, are generally in the past tense and therefore there are reader expectations that research protocols would also be presented in the past tense.

The ethnographer's presentation of self is a much more complex and potentially controversial issue since the method used may convey subtle implications about the role of the researcher in conducting the research.

In selecting a style (and possibly an epistemology) for his or her presentation of self, ethnographic observers can choose to:

1. Write about her/himself in the third person, e.g. the principal investigator, the observer. . .

2. Write essayist prose where the observer is not referred to at all in the narrative and events are stated in typical research style of the past tense, e.g. "observations focused upon the aide's group. . ."

3. Use the inferred first person of eyewitness reporting, e.g., "Arrived to find all children sitting quietly on the rug. Ms. T stops talking to children as she raises her hand to address me."

4. Write in the first person, e.g., "I asked Mrs. Franklin to point out Margaret to me--the only target child I had failed to identify. I had probably overlooked her because. . ."

In developing a model for conducting ethnographic evaluation research in the public schools we had made a concerted effort to include teachers as collaborators in the research, adopting a philosophy of researcher-teacher partnership similar to Bawden, Florio and Wanous (1980). While striving to "fit" into the classroom scene as unobstrusively as possible and with minimal disruption to the ordinary flow of events, we were under no illusion about the change in the scene that our presence could produce. Some mention of self then in the protocols would serve to illuminate the kind of relationship established between researcher and classroom actors and would increase the validity of the data for future use. Further, some use of the first person "I" in the protocols would tend to be more "true" to the assumptions and guiding principals of the ethnographic method rather than copying the style of nonnaturalistic methods which tend to separate the researcher from the researched.

This is not to say that the "I" cannot sometimes be overused or inappropriate. We had directed the EAs to refrain from making value judgements but to record their impressions, concerns or opinions in an addendum to the report. We found that while they usually avoided the former, they seldom included the latter. In the second stage of the study, we made a concerted effort to include more analytical or speculative material at the end of each protocol. The issue here is training people to see and

describe patterns of events and behavior. In addition, further modification in the method of constructing protocols discussed below may increase their usefulness for evaluative research.

Developing a Nomenclature for Describing Classroom Process

This section of the report will discuss a nascent nomenclature that could be used to describe processes observed in classrooms which are implementing activities-based programs for developing mathematics concepts. This nomenclature may be useful for focusing observations as well as in organizing the data for later analysis. Since this nomenclature will necessarily be a result of our experiences as observers in the classroom and can be considered one of the end products of the study, it will only be discussed in an abbreviated form in this present report.

Some of our "naming" refers to interactional variables while others refer to variables within the mathematics curriculum. Two important interactional variables defined by Philips (1980) are "The Attention Structure of face-to-face interaction, or the behavior of teacher and students that signals who is paying attention to whom. . ." and "Discourse Structure, or the way in which different individuals build on the utterances of other. . ." This is important to our study of the role relationships between classroom teacher and resource teacher in implementation. For example, in some of our research classrooms we have observed a parallel team-teaching arrangement where both teachers have carried out simultaneous teaching activities with small groups of students during the mathematics period with no noticeable paying of attention to the others' lesson. We are also interested in noticing the distribution of talk which occurs (Bateson 1972 and Mead 1977), e.g. which children, high or low-achievers, are involved most in whole-group or small-group teacher-directed discourse. Which children continually regain the floor? Another focus for observation is the contrast between child discourse in peer groups with and without adults present. We term this peer group discourse and adult-directed small-group discourse. There appeared to be qualitative differences between the way the Math Project Specialist (MPS), teachers and aides interact verbally with students. Some of our observations suggested that MPS discourse with students is promoting a more verbal mathematics literacy in students' responses to elicitations. In other words, the MPS will more often ask students to verbalize a "number sentence" or "tell a story," e.g. two times five equals ten, while the responses from children to teachers or aides may commonly require only a one word answer. This type of qualitative difference, if borne out in subsequent observations, would be important to the study of the quality of Title I services received by students and also suggests an area where modification in the Title I program may occur when adopted by nonspecialists.

A major focus of our study during the fall was the observation of children playing math games in the classroom. Math games were demonstrated and played by teachers during the inservices and were

viewed as an important part of the Title I Math Project by both teachers and the Math Project Specialists. One kind of Title I service offered by the MPS was to teach games to small groups of Title I project participants and this was frequently given as the reason for their being in the classroom. The following list includes aspects of classroom game playing that should be included in a description:

1. First turn. When children are in charge of a game without an adult manager, the beginning of conflict or long discussions may be about who goes first, second, etc.

2. Monitoring the mathematical accuracy of moves. How is this done? Can the students monitor each other's moves?

3. Consequences of errors. Can the student practice errors in playing the game? Are there rules and penalties imposed when errors are detected by others?

4. Kinds of errors, accidental or strategic. What kinds of mathematical errors occur? Is there evidence of learning and problem solving during the game? Do some children win because of the errors they are making?

5. Group leadership. Is this an adult dominated group? Is there a struggle for dominance by one player?

6. Learning focus vs. social focus. Is the student's concern mainly with winning the game or is s/he intrinsically interested in the math problems posed by the game?

7. Pacing of game. How long does the game last? Does it hold the attention of all players or just that of the child playing at the moment?

8. Distribution of turns. Does everyone get the same number of turns, winners as well as losers? Can the game be won in one turn?

9. End of game. What happens after the game is finished? Do the children play it again or turn to other activities?

In summary, these are a few examples of aspects of program implementation and observables in the classroom that should be described in the research protocol.

Brief Description of the Project Being Evaluated

The Mathematics Pilot Project was in its first year of development in 1978-1979. It was the first Title I Elementary School project in the district to focus exclusively upon mathematics. The goal of the project, that of increasing student understanding of mathematics through effective teaching strategies using manipulatable mathematics materials and a process approach to learning; was built upon the TUSD Mathematics curriculum philosophy. The district had provided a variety of manipulatable mathematics materials to every classroom along with initial inservices during the 1977-78 school year. The Title I effort was directed towards optimizing instructional services for the lowest achievers in mathematics in Grade 3 at eight schools and Grade 5 at nine other schools.

The pilot project was unique in that it was the only Title I project that was experimental in both its conception and its research design, utilizing a service-delivery model that was a compromise between a pullout and a mainstream program. The project design called for three Mathematics Project Specialists (MPSs) to provide mathematics inservices to teachers and to followup the inservice sessions with classroom demonstrations with small groups of target students. Approximately six demonstration lessons were provided to each classroom. This role description was an innovation in that the same people providing a series of inservice training workshops were also showing teachers how to apply the new methods within the regular classroom context. This not only lent credibility to the inservices from the viewpoint of the classroom teachers (who were able to see the teaching strategies in action) but also ensured a greater understanding of the target students learning needs on the part of the resource teachers.

The three mathematics project specialists formed a team with different strengths. One project specialist, a former high school mathematics teacher, had a master's degree in mathematics and had previously worked in the district mathematics staff development and adoption activities. Including a teacher with a extensive background in mathematics was a key factor in the project, since elementary teachers typically do not have a strong mathematics background. Another had been active in the district mathematics adoption process and had been a Title I program assistant. The third was an experienced and successful primary grade teacher. The same people have served in this job role throughout the project.

Mathematics inservices focusing upon the development of mathematics concepts using manipulatives and mathematics educational philosophy were given periodically through the school year. Among other things, this educational philosophy focused upon building insight and understanding of mathematics and avoiding introducing algorithms, formulas, shortcuts and rote learning

too early. Manipulatable materials such as cuisenaire rods and the Powers of Ten Kit were used to model both language and notation for developing mathematics relationships and ideas. Strategies were shared which provided increased opportunities for students to experiment, find patterns, and understand their own solution method. The importance of students having systematic experiences with a wide range of problem solving methods, including estimation, trail-and-error, and logical processes, was stressed.

The pilot project, evaluated through the Title I control group model, resulted in no significant differences between treatment and control groups (Slaughter, 1980). One of the weaknesses of that evaluation design was the lack of classroom implementation measures, a lack which this present study proposes to correct. The project name changed to the Mathematics Resource Project in FY80. Because the mathematics inservices were highly regarded by teachers and Title I parents, inservices were extended to all third and fifth grade teachers in the Title I schools in 1979-80, thereby doubling the number of teachers served. Only teachers in schools which had had the pilot project were eligible for receiving demonstration lessons. As the number of inservices had increased, the number of classroom demonstrations decreased to an average of two to the Classroom Demonstration project classrooms. Evaluation of the second year project indicated modest gains for all groups (Slaughter and Helmick, 1979-80). This study occurred during the third year of project implementation.

Research Sample

At the request of the Title I Elementary Schools Coordinator and Mathematics Project Specialists, teachers were not asked to volunteer for the research project until fall 1980. With the exception of one teacher (Study A) who had volunteered for the project during a summer workshop about ethnographic approaches to observing children's language, teachers were not approached until after the Title I Mathematics Project Specialists had met with them individually to determine whether or not the classroom teacher would volunteer for classroom services from them. Twenty-seven teachers out of a possible 73 volunteered for classroom services from the Title I Mathematics Project Specialists. Of these, nine teachers (including a Grade 2 teacher who was team-teaching with a Grade 3 teacher), were asked to participate in the ethnographic study. All agreed to participate as teacher collaborators.

Selection of the classrooms and teacher collaborators was based upon the following conditions being met.

1. Teacher willingness to volunteer for the research project as well as for Title I Mathematics Project Classroom Services. (Mathematics Project Specialists recommended possible teacher volunteers.)

2. The teacher must be at a Title I school and have Title I students eligible for mathematics services in Grades 3 or 5. The class must be scheduled to receive Title I services during the observation period.

   Grade 3 students were eligible for Title I services if they were rated as very low in attainment of grade level mathematics concepts and scored in stanines 1-3 on a pretest; Grade 5 students were eligible if they were considered low achievers in math by teachers and had scored below the seventeenth percentile on a systemwide mathematics test.

3. Teacher willingness to provide access for observers (who would be taking notes) to conduct the study.

4. Teacher interest in collaborating with researchers and Title I Mathematics Project Specialists in developing a model for studying program implementation.

5. Classroom characteristics and/or student characteristics unique and of importance, e.g. cultural factors, SES factors, to understanding implementation settings for Title I. For example:

   A. Grade levels included in the study ranged from Grades 2 to 5 as follows: Two grade 3 classrooms two Grade 5 classrooms, two combination Grade 4/5 classrooms, one combination Grade 2/3 classroom and one team-teaching arrangement with a Grade 2 and 3 teacher working in two rooms.

   B. The classrooms represented different ethnic groups or combinations, and were in different schools.

Initial meetings were held after school between the PI and classroom teacher collaborators during which the research project was explained and teachers gave their informed consent as participants. In eliciting teacher volunteers, the following purposes of the research were given:

1. To develop an alternative/extension to standardized testing for evaluating Title I programs.

2. To deepen our understanding of Title I classrooms and the needs of children participating in Title I.

3. To increase understanding of the implementation of Title I programs which use resource teachers in the classroom, in this case mathematics resource teachers.

4. To increase understanding of the broad range of unique classroom contexts in which Title I services are offered.

5. To provide a framework for evaluator/researcher, resource teacher, and classroom teacher collaboration in broadening our understanding of Title I programs as they affect classrooms and program participants.

6. To develop a model for studying the implementation of educational programs in the classroom.

Viewing Program Implementation Through the Lens of Applied Ethnography: Some Emergent Themes

There were emergent findings on virtually all of the research questions developed as guides for the study and, in addition, new dimensions and/or conceptualizations of the program and its implementation features became visible as the research progressed. The "results" reported here are neither exhaustive nor comprehensive and are very preliminary in that the data collection phase of the study has just been completed in March. There is a need for time to thoroughly analyze and cross reference the data and to explore the use of triangulation methods for cross-validating the findings.

These preliminary results are organized around a few themes or interpretative trends observed regarding the classroom implementation of the Title I Mathematics Resource Project. As such, program implementation rather than the mathematic content will be the focus of this brief report; later reports will describe some features of the use of manipulatives within the classroom for teaching low achievers. Some major themes:

AMBIGUITY. In talking about the research project with a prospective teacher collaborator the teacher suggested that perhaps teachers need to be inserviced in how to work with resource teachers. That this statement was made by an experienced classroom teacher who had worked in several federally funded schools is suggestive of the ambiguity that surrounds the resource teacher role. In the effort to gain entry into the classroom, and to meet the needs of students and teachers in a variety of contexts, the resource teachers attempted to accommodate their own services to the ongoing situation in the classroom. In doing this there was a tendency for the resource teacher to wait until after individual consultations with the teacher shortly before going into the classroom, or even until after the initial day in the classroom, before fully specifying the kind of services that were to be brought into the classroom.

While the intention of the program implementors to accommodate to individual differences in classrooms was understandable, some unintended outcomes resulted from this ambiguity. First, teachers were often uncertain about what to expect and how to prepare or

organize the classroom to best utilize the resource teacher skills. It is hypothesized that one reason some teachers did not choose to participate in the classroom services project was the ambiguity about what their participation might entail. Because there wasn't any shared model or series of models of how teacher and resource teacher should collaborate within the classroom, the actual organizational pattern for their collaboration occurred during the time the resource teacher was in the classroom--a situation that could be highly anxiety producing for all concerned, especially for a resource teacher not wanting to disrupt ordinary classroom procedures. It also could result in a situation where the intended function of the resource teacher's classroom services, e.g. to help the classroom teacher implement an improved instructional program, was undermined. For instance, the resource teacher role could be perceived as similar to that of an aide or of an enrichment teacher, e.g. as someone providing a special "treat" for the students that was not directly related to instruction. This then resulted in a situation that either would be renegotiated further by the resource teacher or, in some cases, the role of the resource teacher remained ambiguous.

Offsetting the above mentioned ambiguity were carefully planned, well articulated mathematics inservices. The inservices provided an essential part of the communicative process in showing teachers how to use manipulative aids in the classroom and also suggesting what topics should be covered at a grade level as well as strategies for grouping. Most in-classroom units used by resource teachers were built around topics covered in the inservices and teachers generally planned to cover those topics when resource teacher assistance became available. In fact, one effect of the classroom services component of the project was to insure the teaching of topics or use of certain methods within the classroom that had been focused upon in the inservices.

CONDITIONAL COLLABORATION. One theme of the study concerns the conditions established by classroom teachers and resource teachers in working together in the same classroom. In two of our research sites, classroom teachers were very specific in establishing conditions for their partnership with resource teachers previous to implementing the activities-based mathematics project. In research site H, Mrs. H., the classroom teacher, and the school-site Title I project assistant (who had received training from the MPS) worked together all fall and in January to implement the program. Mrs. H. said that she accepted the offer of assistance from the project assistant on the basis that the project assistant work four days a week in the classroom, that they plan together and that both classroom teacher's and resource teacher's lessons be on the same topic except that the resource teacher would use cuisenaire rods more than the teacher. In research site F, Mrs. Franklin, the classroom teacher, requested that Mrs. Jones, the resource teacher, provide materials and lesson plans that both could use during the week the MPS was in the classroom; during that week the MPS would work on the topic

of fractions with the two lowest achieving groups while Mrs. Franklin followed the same lesson plan with the remainder of the class. Further, Mrs. Franklin requested that the fraction unit be restricted to the eights family. In Research site A, Mrs. A., the classroom teacher suggested that the MPS, Mrs. M., provide activities related to a measurement unit, i.e., area and perimeter, that was being developed in preparation for the classes' outdoor camping field trip. When in the classroom, Mrs. A., the teacher rotated all three groups through the MPS activity. (The demands that the classroom unit itself placed on the MPS will be discussed in the next section.) Teachers also tended to change the identification of target students, often adding names to the list, after the resource teacher contacted him or her concerning classroom services.

Resource teachers also imposed limits on their collaboration with classroom teachers. One limitation was the limit placed upon each classroom unit regarding the number and length of time to be spent in the classroom. Others were that the content of services relate directly to a manipulative aid/activities approach to mathematics and that groups worked with would be kept small. A more subtle requirement of resource teacher classroom services relate to the efficiency of the management plan for organizing tasks and social relationships within a specific classroom. Interestingly enough, in two different classrooms we observed the classroom teacher enforcing discipline in the resource teacher group. The resource teacher was perceived as a "guest" in the classroom. It is hypothesized that if these and perhaps other conditions are not met, classroom services of resource teachers will be infrequent.

PREDOMINANCE OF CLASSROOM ORGANIZATION. We found that the resource teachers generally worked within the instructional organization pattern pre-established by the classroom teacher. When children were divided into instructional groups for mathematics, (as recommended by the program) usually the entire class was divided into groups with different activities all related to the same concept. Teachers then asked the resource teacher to instruct one of the rotating groups while they and possibly an aide took charge of the other groups. This structure was followed in the two classrooms where teachers appeared to be having the greatest success implementing the program. In classrooms where the MPS worked only with one or two small groups, the teacher was usually observed conducting whole group instruction with the remaining students rather than observing the resource teachers instruction. (This could be partly an observer effect as perhaps teachers felt they should be "teaching" something when observed.) The small group rotational plan gave classroom teachers the opportunity to guide students use of manipulative and visual aids in learning in an activities approach similar to that of the MPS rather than to engage in recitation organized instruction; attempting the same activity as the resource teacher also provided

a shared basis for discussion following the lesson. In any event, it would seem that the organization of the entire classroom group, not only that of one achievement level, must be considered a determinant in how programs will be implemented in the classroom.

TEAM-TEACHING NOT DEMONSTRATION. The pattern of resource teacher help within the classroom resembled team-teaching more closely than that of specialist demonstrations for practioners within the classroom. Classroom teachers and resource teachers were observed teaching in different parts of the room, seemingly with an unspoken but deliberate effort to not observe the other's teaching. In discussion with another group of resource teachers, they indicated that most of their in-classroom teaching fits a team-teaching model rather than a demonstration model. As mentioned previously, in two of the research sites there was almost a complete sharing of materials and lesson plans. In study H, the classroom teacher was observed saying the same thing, almost at the same time, as the resource teacher due to using the same lesson plans but both seemed unaware of each other.

The team-teaching situation is perhaps the best that can be devised for carrying programs into the classroom. The team situation allows the resource teacher to perform as a professional educator in a controlled situation and allows s/he to use methods and materials developed in inservices and to be there to detect difficulties teachers and/or students may have in utilizing a program. Then too, the mathematics specialists in our project disclaimed the "specialist" part of their job title, indicating the possible unease school people may have regarding a role that might be considered one of dominance rather than of equalitarian collaboration.

TEACHER EVALUATION OF THE INNOVATION. In several of our case studies we found that the teacher evaluated student learning soon after the unit, using manipulative aids and resource teacher help, was completed using informal tests including those found in the textbook. If students performed well on the subsequent tests teachers accepted both the new approach and the results as valid. However, if students did poorly on paper and pencil tests, this was taken as an indication of the failure of the method for producing improved achievement, a failure that was especially disappointing because of the time consuming nature of the activities program. This use of tests by teachers for evaluating the program was unexpected, as tests had been deemphasized in the inservices. However, teachers apparently were responding to pressures beyond curriculum resource circles in the importance they placed on test results.

Issues Suggested By The Trends in This Study

One feature of ethnography is that it provides a database that can be used in multiple levels of analysis to answer a variety of questions some of which may emerge after the data

collection phase is completed. Unlike an ethnographic study regarding a distant primitive culture, this study and others like it, may be immediately relevant to policy decisions and therefore can have undeniable implications, politically. Because of this it is especially important to stress the limitations of the study, e.g. a small self-selected sample, limited time frame, only experienced teachers participating, etc., when describing themes in the data and in addressing questions raised by the study. It is especially important that these results not be taken out of context as a national debate develops about the future of categorical aid programs in education, (of which Title I is the largest). However, in recognition of the political context in which this study may be viewed, an abbreviated statement regarding the larger political context is given below.

Our study, as was the program it evaluated, was designed to explore further the character of mainstream Title I programs in the classroom. Our bias has been to support the intent of mainstream programs, i.e., to improve the educational opportunity of low achieving students within the regular classroom, thereby offsetting the possible detrimental effects of pullout programs (for a fuller discussion of mainstream vs. pullout, see Glass and Smith, 1977).

The results described as themes suggest that in order to improve the quality of the instructional program, for any group of low achieving Title I students within a classroom context, the Title I program "treatment" must take the structure and organization of classrooms into consideration in all stages of implementation. Teachers plan their instructional programs for entire classes, including grouping practices. In order to be effective, any mainstream program has to be planned within this total classroom group context. This has implications for a reinterpretation or modification of regulations regarding the administration of compensatory education programs. Some critics of mainstream approaches to Title I have complained that benefits intended only for the very low achievers identified as Title I target students will accrue to nontarget students in a Title I classroom program. However, the nontarget students may also be below average in achievement. We have found in our study that the so-called target group is a "moving target;" in other words, the group identified as low achievers in one mathematics area, e.g., multiplication, may not be the same group of children as those identified as low achievers in another area later in the year, e.g. fractions. This has been a well-known problem with any rigid categorizing of students into ability groups, a fact disregarded by those responsible for writing the Title I regulations. A classroom level program, where classroom teacher, resource teacher and instructional aide team to improve the instructional program may not only be an effective way to improve instructional delivery services to low achievers, it may also be a step towards improving the basic skills of students generally. Bossert (1979, p. 94) suggested that social relationships resulting from small

group, multi-task instructional organization may have a direct and positive influence upon student achievement. Further, the ethos of American education requires equal treatment of everyone in the room; it is awkward if not repugnant to provide attractive and challenging services to some children and deny them to others within the same classroom as would be required by a strict interpretation of Title I regulations. It can be argued that in many situations, without compensatory assistance to low achievers, the most valued classroom attribute, i.e., teacher-student dialogue, is allotted disproportionately to higher achievers. If classrooms and/or schools were targeted for Title I services rather than individuals, the result might be more effective programs. The final section of this paper summarizes some steps to be followed in using ethnography for evaluative research in school district.

A Model for Conducting Classroom Ethnographic Evaluation Studies By and Within School Districts

This is an abbreviated account of a suggested research agenda for use by school district evaluators in developing and conducting classroom ethnographies to be used for educational program evaluation. The model is interdisciplinary and is based upon concepts derived from anthropology, ecological psychology, teacher effectiveness research, sociolinguistics and the educational evaluation literature to the extent that they can be applied by a school district evaluator who is themself, a participant of the school district community. The model, as stated here, is elucidated by the body of this report and other reports regarding the NIE grant which is funding this research. Perhaps the best single reference for conducting ethnography in the schools is Cassell (1978) A Fieldwork Manual for Studying Desegregated Schools.

1. Evaluators Network

It is strongly recommended that an evaluator establish his/her credibility within a school district for a year or more before attempting to implement an ethnographic study. Further, the support of the project coordinator and of central administrative curriculum personnel is essential.

2. Informed Consent of Participants

Classroom ethnography relies upon the teacher volunteer; the voluntary context of the research forces the creation of a very special research environment of interdependent actors. As a part of obtaining informed consent, candidates for

participation must be informed of the central purposes of the research and also of the responsibilities, limitations and consequences (if any) of their participation. As in oral history, care must be taken that research reports about the study are not harmful to the participants. In our study we assured teachers of confidentiality which follows both the ethics of ethnography and of program evaluation, which clearly eschews personnel evaluation (Standards for Educational Evaluation; Stufflebeam et al., 1978). The principal investigator and ethnographic assistant met after school to discuss and plan the research agenda with each teacher. We found it helpful to send a letter explaining the parameters of the study as a followup (Appendix D).

3. Maintaining Confidentiality

Cassell (1978, p. 77) noted that because of the continuing relationships formed between observers and participants at the site, heeding strictures regarding confidentiality become increasingly important over time. Ethnographers observe or are informed of many kinds of information which otherwise would not be known by outsiders. Preserving the confidentiality of informants, including children, is crucial to both the ethics and validity of the study. Decisions regarding the use of some types of "private" information are not easy and judgement may dictate that certain bits of information not be included in a study even when relevant. Usually, studies of this type are rich enough without the inclusion of "private" data.

4. Ethics

The ethical basis for ethnographic research was described in the previous sections on informed consent and confidentiality. The research site, e.g. public schools, must be kept open for future research. There are ethical issues and/or considerations also in the way observations are conducted, the way reports are slanted, review procedures available for teacher collaborators and provision of feedback to teachers. Our concern was to not only be as unobstrusive as possible in the classroom but to make those being observed as comfortable as we could in order to preserve an anxiety free environment.

In scheduling observations four days a week or less we attempted to be sensitive to a teachers need to not be observed at any particular time. We instructed the observers to never write down anything while they were in the classroom that would be upsetting or embarrassing to the teacher or students. The protocols that were written later were to separate-out ethnographer opinions, judgements and hypothesis from the main report of ongoing events. (We plan to ask teachers to review the protocols from their classrooms and the results of the study later this year.) Feedback to teachers during the study was

not about evaluative judgements but consisted of dialogue about ongoing events and also some discussion of their perspective about an emergent hypothesis concerning some process, including their use or modification of the innovation. Teachers were treated as collaborators, not subjects, in the study.

5. The Viability of the Program Being Evaluated

An ethnographic study, because of its expense, human-interaction and involvement, and close scrutiny should only be planned if the program to be evaluated is viable in at least one of the three senses of the word as defined in the Oxford American Dictionary, (Ehrlich et al., 1980):

1. (of a fetus) sufficiently developed to be able to survive after birth.
2. (of a plant) able to live or grow.
3. practicable, able to exist successfully, a viable plan. . .

6. Program Evaluability

The question of evaluability, or whether a program is specific and structured to the point where it can be evaluated is complex. However, ethnography can be used in situations where other kinds of preset evaluation techniques would be inoperable. The answer regarding whether an observational study can be rationally implemented in a particular context will depend to a certain degree upon the persistance and facility of the evaluator in working with program implementors and recipients, and also to a large extent on the attitudes of both towards the possible benefits of the program for students (which again suggests the importance of program viability). Establishing a research observation schedule was not easy in the fall phase of our study, as can possibly be expected in a mainstream program, but the high regard of the teachers towards the potential benefits of the Title I mathematics services helped us to implement the research as well. Teachers were also interested in participating because of their support for alternative evaluation strategies, including their encouragement of a person from central administration spending time in classrooms and because they were interested in a reflective view of their own teaching.

7. Curriculum, Not Interpersonal Relations, Emphasis

We feel that ethnographic evaluations of a curriculum area, e.g. a reading program, math program, etc. will find easier acceptance be more practical to carry out (because the observations cover one period not the whole day) and will produce the most readily usable results, for use in evaluation studies.

8. Staffing

The employment of parttime personnel to serve as ethnographic assistants to the evaluator proved to be the single most important feature of the staffing plan. The ethnographic assistants carried out scheduled systematic observations, with a concentration of site observations and regular report writing, which could not possibly have been carried out by senior evaluation personnel responsible for multiple projects. For instance, each hour of observation required approximately three hours of write-up time. Furthermore, the ethnographic assistants (EAs) had the time to continually maintain and renegotiate rapport with persons at school sites. Because there were three EAs the study could be carried out at several sites simultaneously.

Selection criteria for ethnographic assistants included (1) background in the social sciences, (2) ability to develop and maintain good interpersonal relations, (3) experience in teaching and in the curriculum area studied, and (4) well-developed writing skills.

An ethnographic project is paper, writing and typing intensive. Adequate secretarial support for the project is very important.

Consultants from the fields of educational psychology and educational anthropology helped to provide a training program for classroom observers in which program implementors were also included. Further, a different and potentially more powerful situation for evaluation resulted from discussions of program implementation among the evaluation group (principal investigator-evaluator, ethnographic assistants and consultants) and program implementors than normally occurs between a single evaluator and a number of program implementors.

9. Training Observers and Implementors

It has been widely recognized that the training of observers for naturalistic studies is crucial to the quality of the data, as well as to the maintenance of rapport with persons in the field. The training program also has to be designed appropriately for the educational level and background of the observers (ours all had masters degrees).

The training program emphasized the subtleties and factors of introducing an innovation into the classroom (an aspect of the training program especially meaningful to the implementors) as well as (1) the context and background of the program to be evaluated, (2) establishing and maintaining rapport with classroom teacher collaborators, (3) focal points for observations and (4) writing protocols. Notebooks containing a sample from ethnographic studies and writings on methodological issues

were provided to the observers and implementors and discussed. (Teachers were not included in the training in our study because of logistics; teachers were not selected for the study until after the training sessions which occurred after school opened in the fall.)

An important aspect of the training was the ethics of ethnographic research, especially regarding anonymity of participants. A coding system was established for use in writing protocols to preserve anonymity. A form was devised for hand-written narratives similar to that used by Evertson at the University of Texas. Examples of protocols given in the Evertson study and also by Ray Rist in the BTES were invaluable in providing models for the ethnographers to use in writing narratives. Later, we developed our own models for writing protocols. We also found that actual classroom observations rather than videotapes were more useful in training the ethnographers.

The ethnographic assistants also observed and were participants at the mathematics inservice workshops provided for project teachers. This served the dual purposes of documenting intended program implementation communicated to teachers and to further sharpen observational skills in the area of mathematics.

A nonjudgemental, distinctly anthropological approach to observing and describing classroom scenes and program implementation was maintained throughout the training sessions and during the study. (This was described in greater detail earlier in this report). We found it relatively easy to train the EAs to produce eyewitness level protocols of classroom events; it was relatively more difficult to have them produce "thick descriptions" containing hypotheses about patterns or relationships in the behaviors observed. Periodic informal meetings between the principal investigator and EAs, during which classroom and program implementation events were discussed, proved invaluable to developing richer insights about the study.

10. Setting the Context with Program Implementors, Building Principals, Teachers and Students for Conducting An Observational Study

In conducting an ethnographic study of resource service delivery to classrooms it is very important to work very closely with the project coordinator and resource staff. The nonjudgemental, descriptive and collaborative framework of the ethnographic approach (vs. the personnel evaluation approach) must be clearly articulated. The selection of teachers as candidates for collaboration with researchers should be done in a way that the teachers have a real option not to volunteer. For this reason we contacted teachers ourselves, (after clearing the possibility of a research project with the principal) rather than having the principal request that teachers participate. We also selected teachers who the resource staff felt comfortable

working with and who were experienced and capable. The conditions and limitations of the study were carefully discussed by the observers and teacher before any observations occurred. Teachers explained the observers presence in the room to students as someone who is interested in how children work and sometimes made name tags for the children to wear during the first day or two to identify students. The observers reported that after a day or two children seemed not to notice the presence of the observer, although there was some initial interest in the notetaking (one reason to keep notes as bland and nonjudgemental as possible).

In establishing themselves in the field, the observers attempted to develop a dialogue between themselves and the teachers regarding ongoing classroom events. This served to enrich the observations as the teacher became an informant for the study and also this shared perspective gave the teacher some indication about the content and focus of the observations.

11. Duration of the Study and Scheduling Observations Around Implementation

One reason that may have accounted for our success in obtaining teacher volunteers for the study was that we restricted the study to 20 observations or a four to five week period, and observations occurred mainly during only one period, the mathematics period. The observation schedule of conducting observations before, during and after resource teachers were in the classroom was an efficient way to study program implementation. Coordinating the research agenda with the resource teachers also provided insights into the service delivery mechanisms of the project.

12. Data Collection

The protocols contained (1) an overview or abstract of the focus of that day's observation, (2) detailed description of classroom organization and instruction and students involvement and response to instruction, and (3) comments or insights of the observer about the meaning of what had transpired. The protocols were written up daily and/or weekly and were given to the principal investigator for review, comments, and questions. After the study was completed at each site, the ethnographer summarized it and planned a final interview with the teacher during which the program would be discussed and her/his reactions to tentative hypotheses. Later in the study, teacher review of protocols and collaboration in the final case study descriptions is planned. This will not only provide feedback to teachers but will assist in validating the findings.

13. Levels of Data Analysis: Time Constraints on the Analysis of the Data

It is a well-known fact that evaluation research functions in a context of severe time-constraints; conversely, ethnography studies are notoriously time consuming to analyze and write up. Therefore it is necessary to plan several stages of analysis, some of which can be ongoing during the course of the study. It is particularly important to review the protocols as they are produced to determine whether data on relationships of emergent interest in the study are being collected, and also to generate hypotheses. As themes begin to emerge in the data during the study, it may be possible to use methods of triangulation or cross-validation in various settings to test hypotheses. Porter-Gehrie and Crowson (1980) suggested that early data samples be collected around focal issues and later analysis occur about case studies and the meaning of relationships across case studies. In our study we plan to produce relatively short case studies of each site using excerpts from protocols before, during and after program implementation in the classroom followed by a general report organized around themes with examples from each case study. The ethnographic assistants will help with the preliminary analysis.

14. Reporting Results

In preserving anonymity of participants while remaining "true to the data" it may be more useful and practical to develop the latter, e.g. reports developed around themes with relevant examples from different sites, then geographic site studies. This type of report also may be more readable and useful to various audiences.

There is a need for feedback to participants. It is suggested that collaborating teachers be given an example of a protocol before the observation study begins. It may also reduce teacher anxiety if teachers have a chance to read one or more protocols during the observational period. However, premature sharing of findings may interfere with the "natural course" of events being observed. We plan to ask classroom and resource teachers to review our findings and the data from their classroom near the end of the study; we also plan to involve them in developing program recommendations.

15. Caveats, Difficulties and Things Not To Do

From doing fieldwork to setting up the logistics for the study to final report writing there are a number of pitfalls to be avoided. Space does not allow their enumeration here however in planning this present study several references were extremely useful. Guba (1980) warned that evaluation

may be dysfunctional to performance and that anxiety may be one of the spinoffs from evaluation. Therefore the value and potential utilization of the information to be gained from a study must be a good trade-off for the imbalance that it may cause. Also evaluators must be prepared to take steps to alleviate anxiety as much as possible that is caused by the study. The elaboration of problems encountered in a study by deVoss, Nott and Zimpher (1980), especially their warning about not overemphasizing the legal or potential risk factor in obtaining informed consent, was instructive for this study. Also noted in several studies was the need to replace observers during the study, something that we had to do in January. We found that the already trained observers were helpful in training the new member of the staff.

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Table 1. Research Time Line for Stage One of the NIE Classroom Implementation Study, Fall 1980 35

Research Site A; Combination Grade 4/5 Classroom, Teacher A, Ethnographic Assistant (EA) 3 (Mathematics period, 10:45 - 12:00)

Summer 1980. Teacher A volunteered to help in anyway as a participant in the project.

9/18/80. Conference after school between Teacher A and principal investigator to confirm Teacher A's participation in the study and to further explain the study.

Week 1 of Study, October 6. 2 classroom observations (EA) (mathematics periods were one hour and 15 minutes), 26 students in classroom, of which 11 are in Grade 5, 15 in Grade 4.

10/13/80. Conference after school among Teacher A, principal investigator and mathematics project assistant to discuss and plan Teacher A's participation in the study.

Week 2 of Study, October 20. 3 classroom observations (EA) 1 classroom observation, principal investigator (PI) 1 observation of mathematics inservices involving Teacher A (PI, EA).

Week 3 of Study, October 27. Title I Mathematics Project Specialists in classroom, 3 days. 4 classroom observations (EA), 1 classroom observation (PI).

Week 4 of Study, November 3. 2 classroom observations, Monday and Tuesday (EA). 1 observation of classroom group at Camp Cooper, followup of mathematics lesson.

FUTURE PLANS: Ethnographic interview of Teacher A, enthnographic interview of mathematics resource teacher.

Research Site B; Two classrooms with team teaching organizational plan, Teacher B, Grade 2; Teacher C, Grade 3, Enthographic Assistant (EA) 2 (Mathematics period, 12:15 - 1:15)

10/3/80. Conference with Teacher C regarding research study, Teacher C volunteers--short confirmation of Teacher B, volunteer 10/6/80

Week 1 of Study, October 13. 2 classroom observations by the ethnographic assistant (EA), 1 classroom observation by principal investigator (PI) (observations were of both classrooms, there were 14 students in Grade 3 and 22 in Grade 2).

Week 2 of Study, October 30. 4 classroom observations (EA), 1 classroom observation (PI). Observation of Mathematics Project Inservice (EA, PI).

Table 1. Research Time Line for Stage One of the NIE Classroom Implementation Study, Fall 1980 (contd.)

Week 3 of Study, October 27. 3 classroom observations (EA), 1 classroom observation (PI). Mathematics Project Specialist spent 2 days in Grade 2 classroom, 1 day in Grade 3 room.

Week 4 of Study, November 4. 2 observations, EA.

Week 5 of Study, November 10. 1 observation, EA.

FUTURE PLANS: Include an ethnographic interview of teachers, fall 1980 and returning to the research site in Winter 1981 to further observe Title I mathematics resource teacher and followup in classroom.

Research Site C; Combination Grade 2/3 classroom, Teacher D, Ethnographic Assistant (EA) 2 (Mathematics period 10:45 - 11:30)

10/8/80. Conference between Teacher D and principal observer during which research is explained and teacher volunteers to collaborate in the study.

10/15/80. Conference among Teacher D, PI and ethnographic assistant to introduce teacher to EA.

10/16/80. Initial classroom observation by EA.

Week 1 of Study, October 20. 2 classroom observations, EA.

Week 2 of Study, October 27. Mathematics resource teacher in classroom during one math period, teacher out for inservice in other program, Halloween activities. 2 classroom observations, EA.

Week 3 of Study, November 3. 3 classroom observations by EA, 1 classroom observation by PI. 1½ hour after school conference about math between teacher and math Project Specialist.

Week 4 of Study, November 10. 2 classroom observations by EA.

FUTURE PLANS: Include ethnographic interview of classroom teacher.

HS/ch
NIE Math Project
11/20/80

APPENDIX B

Narrative Form - Classroom Ethnography

Page 1 of ____

Date _____ Teacher Code # _____ # Aides Present _____

Beginning time _____ Observer Code # _____ # Parents Present _____

Ending time _____ # Students Present _____ # Others Present _____

1. _____
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Narrative Form - Classroom Ethnography

Page____of____

Date_____ Observer #_____

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APPENDIX C

AGENDA

Program for Training Ethnographic Assistants[1]

NIE Classroom Implementation Study

9/22/80 Monday	8:30 - 8:45	Introduction and Getting Acquainted (Helen Slaughter)
	8:45 - 9:30	Orientation to the Research Study: a) Purpose, b) Scope, c) Developing an Ethnographic Model for Studying Program Implementation and d) Ethics in Ethnographic Research (Helen Slaughter)
	9:30 - 10:00	Orientation to the Title I Mathematics Project 1) Approach to mathematics education of the project 2) Ways of working with classroom teachers (Title I Mathematics Project Specialists)
	10:00 - 10:15	Break
	10:15 - 11:30	Ethnography (Jack Chilcott)

Suggested readings: Bawden, Robert, Susan Florio and Donna Wanout. "Learning from Teachers: Lessons about Professional Development Drawn from Teacher Participation in Research and Evaluation."

Carrasco, Robert. "Expanded Awareness of Student Performance--A case Study in Applied Ethnographic Monitoring in a Bilingual Classroom."

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Geertz, Cliford. "Deep Play: Notes on the Balinese Cockfight." The Interpretation of Cultures.

[1]Note: Training will include dicussions of some of the suggested readings.

9/23/80 Tuesday	9:15 - 10.15	Videotape: Mathematics Demonstration for TUSD Teachers (Mary Baretta Lorton) Developing Observational Strategies Focusing/selecting topics to be included in Narratives Notetaking vs. summarizing skills (David Berliner)
	10:15 - 10:30	Break
	11:15 - 12:00	Sociolinguistic framework for studying classrooms; social interaction and context (Helen Slaughter) Suggested readings: Rist, Ray. Ethnographic Techniques and the Study of the Urban School. Mehan, Hugh. Learning Lessons: Social Organization in the Classroom.
9/24/80 Wednesday	8:30 - 9:30	Videotape of a Third Grade Mathematics Classroom Lesson: Discussion (David Berliner) Development of Behavioral Indicies of Implementation (David Berliner)
	10:15 - 10:30	Break
	10:30 - 11:30	Non-Participant/participant observation and information gathering--etic and emic approaches (Jack Chilcott) Suggested readings: Behr, Merlyn J. (Case Study of One Child) Teaching Experiment: The Effect of Manipulatives in Second Graders' Learning of Mathematics. Smith, Louis. An Evolving Logic of Participant Observation. Rist, Ray, C. and William J. Tikunoff. Manual: Ethnographic Observation in the Classroom
9/25/80 Thursday		No meeting: Ethnographic Assistants attend mathematics workshop for Grade 3 teachers 8:30 - 11:30, Room 302, Roskruge

9/29/80 Monday	8:30 - 9:30	Discussion of Ethnographic Assistants Impressions of the Study to Date
	9:30 - 9:45	Break
	9:45 - 11:00	Classroom Ethnography (Jack Chilcott)
	11:00 - 11:30	Entry and Establishing Oneself in the Field (Helen Slaughter)
		Suggested readings: Wolcott, Harry. The Elementary School Principal.
		Carew, Jean V. and Sara Lawrence Lightfoot. Beyond Bias: Perspectives on Classrooms.
9/30/80 Tuesday		No meeting: Ethnographic Assistants observe mathematics lesson in classrooms not participating in the study.
10/1/80 Wednesday	8:30 - 10:00	Discussions of Ethnographic Assistants Classroom Observations
	10:00 - 10:15	Break
	10:15 - 11:30	Possible Effects of Introducing an Innovation into the Classrooms (Jack Chilcott)
		Suggested readings: Fullan, Michael and Pomfrel, Alan. Research on Curriculum and Instruction Implementation (Excerpt: Determinants of Implementation) Review of Educational Research. Winter 1977.
10/6-8/80 Monday - Wednesday		Two days of observation experience for ethnographic assistants (EA). Two EAs observe in nonparticipating classrooms, one observes in a research site classroom.
10/13/80 Thursday		Training session with PI and consultants. Group reading and discussion of EA protocols from previous weeks observation.
		PI observes in 2 research site classrooms at same time as EA followed by consultation discussion of focuses of observation discussed in the study.
10/21 or 23/80		EA attend Title I mathematics inservices with teacher collaborators.

10/23/80	PI meets with EAs to coordinate and discuss the research.
10/31/80	Research meeting, PI, consultant Jack Chilcott, 1 Title I mathematics Resource Teacher and the 3 EAs to discuss the classroom observations, specifics of services offered by Title I resource teachers to classrooms.
11/20/80	Training in ethnographic interviewing techniques.

TUCSON UNIFIED SCHOOL DISTRICT

P.O. BOX 40400
1010 EAST TENTH STREET
TUCSON, ARIZONA 85717

January, 1981

Dear

Thank you for volunteering to participate as a teacher collaborator in the Classroom Implementation Study of A Supplemental Mathematics Program, funded by the National Institute of Education (NIE) under the Teaching and Learning Grant.

We plan to begin our observations of the mathematics program in your classroom soon. The observations will occur three or four periods a week for approximately four weeks. All observations are to be scheduled at the teacher's convenience and fit into your schedule. We will check with you weekly and daily to schedule the observations. Observations may be cancelled whenever inconvenient for the teacher and observations will not occur when there is a substitute teacher. The maximum number of observations is 20, including four observations which I plan to conduct personally. Confidentiality and anonymity is assured for all participants.

The observers have all been teachers and have worked in the schools. They have been trained in ethnographic observation techniques and will be as unobtrusive as possible. During their first two weeks in your classroom they will be focusing upon the total environment and also trying to learn the names of Title I math project participants, for whom they will have a list.

We would like to thank you for your willingness to participate in this study by paying you at the consensus rate of $11.00 per hour for any extra time you spend discussing your program and students with myself and/or the observer either after school or during break times, etc. We have a budgeted amount of NIE funds for this purpose. We also have two days of released time substitute pay which may be used for you during the study to facilitate the research (this is optional based on your own interests and availability). We hope to use a part of this to provide feedback to you regarding the results of research done in your classroom, and also to give you a chance to review and make comments concerning the research.

Thank you again for being a part of our research team. If there are any questions or concerns about the study as we go along please call me at 791-6138.

Sincerely,

Helen Slaughter

Helen B. Slaughter
Principal Investigator
Classroom Implementation Study of
An Activities-Based Supplemental
Mathematics Project

HS/ch

Handout for AERA Session 34.36
Title I Task Force on Evaluation

Excerpt from (Session 25.25):
Classroom Ethnographic Study of
An Activities-Based Supplemental
Mathematics Program

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A Model for Conducting Classroom Ethnographic Evaluation Studies By and Within School Districts

This is an abbreviated account of a suggested research agenda for use by school district evaluators in developing and conducting classroom ethnographies to be used for educational program evaluation. The model is interdisciplinary and is based upon concepts derived from anthropology, ecological psychology, teacher effectiveness research, sociolinguistics and the educational evaluation literature to the extent that they can be applied by a school district evaluator who is themself, a participant of the school district community. The model, as stated here, is elucidated by the body of this report and other reports regarding the NIE grant which is funding this research. Perhaps the best single reference for conducting ethnography in the schools is Cassell (1978) A Fieldwork Manual for Studying Desegregated Schools.

1. Evaluators Network

It is strongly recommended that an evaluator establish his/her credibility within a school district for a year or more before attempting to implement an ethnographic study. Further, the support of the project coordinator and of central administrative curriculum personnel is essential.

2. Informed Consent of Participants

Classroom ethnography relies upon the teacher volunteer; the voluntary context of the research forces the creation of a very special research environment of interdependent actors. As a part of obtaining informed consent, candidates for