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ABSTRACT

A collaborative research and development project resulted in three research/intervention projects (R/IPs) using an inquiry-based process for student teachers, cooperating teachers, and teacher education faculty. A cross-site analysis identified relative differences among the three projects, variables associated with the projects, and interactions among the variables. The impact of the R/IPs upon classroom teaching behaviors and continued use of research in teacher education was described. There was little variation across the three projects; however, there were considerable differences in the goals, initial planning, and method of intervention. The relationship between each teacher education program and its cooperating school district was especially important. There were no clear results regarding change in classroom teaching behaviors. However, the perspectives of student and cooperating teachers toward the value of research became increasingly positive across all three sites. Achievement of the project goal of a continuing and expanding network among teacher education programs and local education agencies appeared promising. (Author/JD)

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# FAR WEST LABORATORY

FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

A CROSS-SITE ANALYSIS OF RESEARCH/INTERVENTION STRATEGIES  
IN THREE TEACHER EDUCATION PROGRAMS

Applying Research in Teacher Education:  
Research Utilization in Elementary Teacher Education

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August 1984

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## ABSTRACT

This report describes a collaborative research and development project implemented by Far West Laboratory for Educational Research and Development in conjunction with The University of Utah, The University of Nevada at Reno, and Mills College in Oakland, California. The main purpose of this project was to stimulate and support collaborative development of preservice teacher education strategies, based on the assumption that there is a relatively substantial body of recent research findings on effective instruction that could be rapidly and usefully incorporated into classroom practice.

The overall project resulted in three research/intervention projects (R/IPs) using an inquiry-based process for student teachers, cooperating teachers, and teacher education faculty. A cross-site analysis identifies relative differences among the three research/intervention projects, variables associated with the different projects, and the interactions among the variables. The report further describes the impact of the R/IPs upon classroom teaching behaviors and the continued use of research in teacher education programs.

In general, there was little variation across the three research/intervention projects. However, there were considerable differences in the goals, initial planning, and the method of intervention. The relationship between each teacher education program and its cooperating school district was especially important.

There were no clear results regarding change in classroom teaching behaviors. However, the perspectives of student and cooperating teachers toward the value of research became increasingly positive across all three sites. Achievement of the project goal of a continuing and expanding network among teacher education programs and local education agencies appears promising as well.

## ACKNOWLEDGMENTS

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Support by Becky McReynolds, editor, and Patricia Ferman, secretary, in the final production of the report is especially appreciated. This project was truly the result of the collaborative efforts of many people.

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## CHAPTER ONE

### INTRODUCTION

Over the past year and a half, a series of reports decrying the sorry state of education in America have been highly publicized. A central concern of all these studies has been the poor quality of our elementary and secondary teaching force. The President's Commission on Excellence in Education, for example, reports in A Nation at Risk: The Imperative for Educational Reform that "not enough of the academically able students are being attracted to teaching; that teacher preparation programs need substantial improvement; that the professional working life of teachers is on the whole unacceptable; and that a serious shortage of teachers exists in key fields." (1983)

While these reports have been welcomed by educators for shedding much needed light on the myriad problems of the teaching profession, their findings hardly come as a surprise to professionals who have been grappling with the difficulties of bettering our system of schools for years. Since 1978, Far West Laboratory for Educational Research and Development (FWLERD) has been involved in a number of efforts improving the quality of classroom teachers by facilitating teachers' incorporation of the research on effective teaching practices into their regular classroom activities. Continuing this tradition, in December of 1982, Far West initiated a program directed at improving the preservice educational experience of classroom teachers.

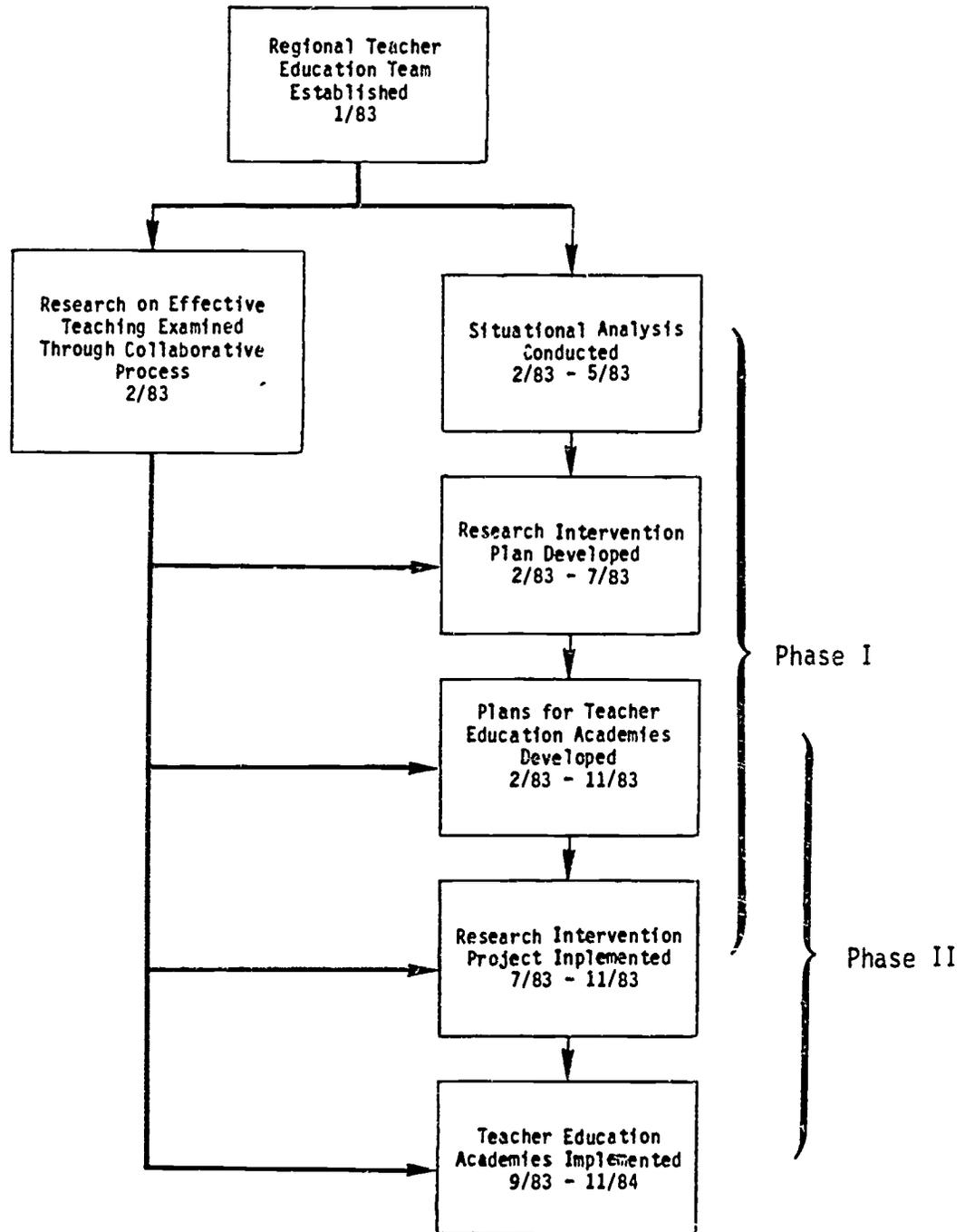
## Background of the Project

The Applying Research in Teacher Education (ARTE) program focuses on the development of techniques for applying research on effective instruction and effective schools to education personnel development during the teacher education period. As with Far West Laboratory's earlier efforts aimed at improving teaching, the program was premised on the assumption that there is a relatively substantial body of recent research findings on effective instruction that could be rapidly and usefully incorporated into classroom practice. Moreover, the ARTE program was based on the assumption that teacher education programs could incorporate research as an inquiry-based process for student teachers, cooperating teachers, and teacher education faculty.

One facet of the larger ARTE program is the Research Utilization in Elementary Teacher Education (RUETE) project. The RUETE project includes two activities: the development and implementation of three research/intervention plans and the formation of ongoing Teacher Education Academies. A description and analysis of the completed research/intervention projects are the focus of this report. Figure 1 presents a schematic chronological outline of the RUETE project.

In Phase I of the RUETE project, Far West Laboratory selected and convened a Regional Teacher Education Team (RTET), consisting of the Far West Laboratory Project Director and experienced teacher educators from the following institutions in the Laboratory's region:

Figure 1  
RUETE Chronological Outline



- o University of Utah, Salt Lake City (Amy Driscoll, Regional Research Fellow), in collaboration with the Salt Lake City School District;
- o University of Nevada, Reno (Kenneth Johns, Regional Research Fellow), in collaboration with the Washoe County School District; and
- o Mills College, Oakland, California (Richard Ponzio, Regional Research Fellow), in collaboration with the Vallejo City Unified School District.

The team collaboratively examined the consistent patterns of research findings about effective instruction and successful elementary schools. The RTET members then undertook several structured activities to practice observation strategies for the application of this research to their own instructional programs for preservice teachers. The structured activities enabled each member of the team to generate a document synthesizing their experiences and to tailor those to their own teacher education programs.

In the second step of the project, the Research Fellows wrote Situational Analyses of their home institutions' teacher education programs. These analyses described in detail the Research Fellow's university, the cooperating school district, and the community in terms of the teacher education program, preservice teacher characteristics, state certification requirements, and the recruitment and hiring criteria for local education work forces.

The Situational Analyses provided the Research Fellows with the necessary baseline data to develop plans for using the research on effective instruction at their individual sites. In collaboration

with Far West Laboratory staff, the Research Fellows each created a research/intervention plan (R/IP) that integrated relevant research findings and classroom instructional analysis techniques into his or her institution's preservice teacher instructional program. Through the late summer and early Fall of 1983, the Research Fellows implemented their training designs in an attempt to enhance the quality of teachers entering the local elementary school teaching force.

During this same period, each Research Fellow began to develop plans for the creation of a Teacher Education Academy (TEA) at his or her own site. The Teacher Education Academies, which are being implemented as part of Phase II of this project, will serve as a forum for addressing the concerns of teacher educators and local educational agency personnel and for furthering the incorporation of research-based knowledge into the elementary teacher education process.

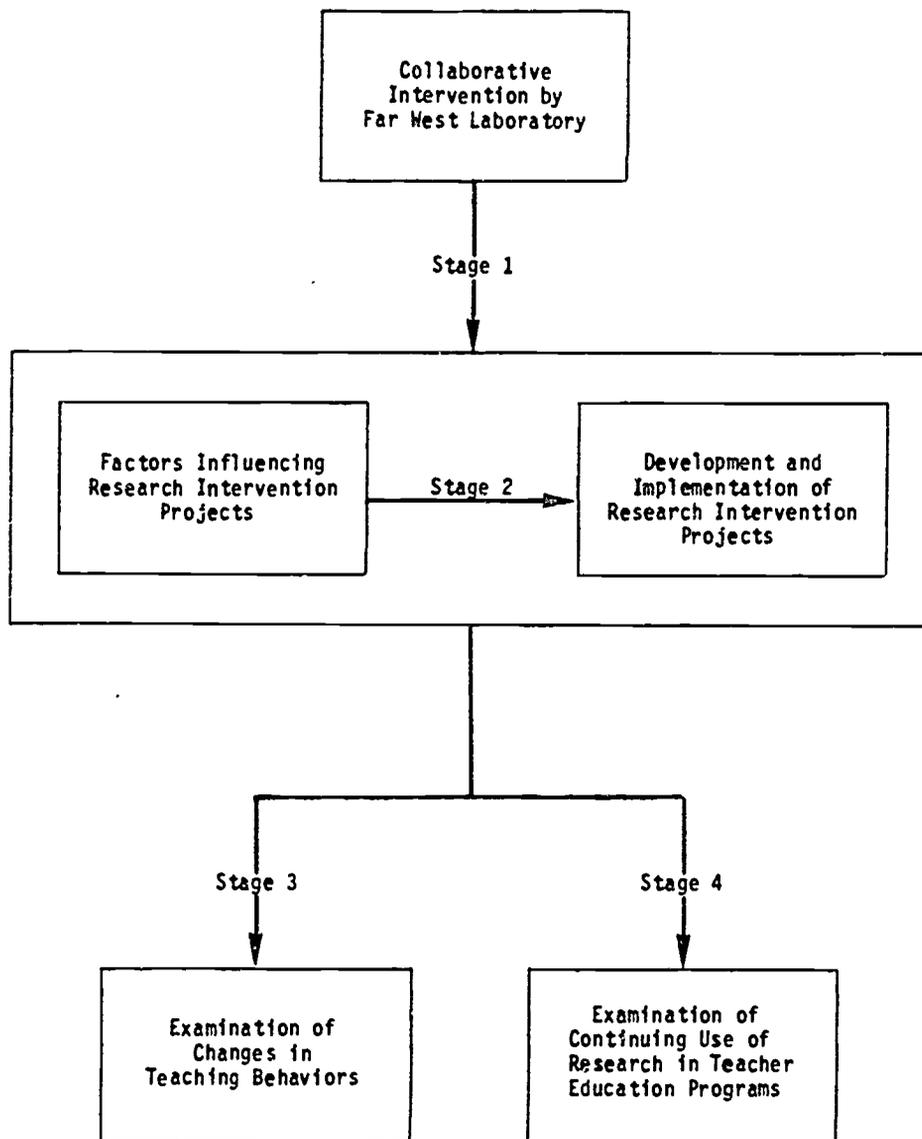
### Conceptual Framework

This report limits itself to a cross-site analysis of the development and implementation of the three research/intervention projects. Analysis of the research/intervention projects fits conceptually into four distinct stages. This framework is presented schematically in Figure 2 and explicated below.

#### Stage 1

Far West Laboratory actions in carrying out this project constituted the first step in the entire process. Far West Laboratory chose the participating teacher educators, brought them

Figure 2  
RUETE Conceptual Framework



together in the RTET, structured and facilitated their meetings, selected the relevant research for examination by the team, and remained, throughout the project, the central organizing force. This intervention can be considered a constant in the process in that all the Research Fellows were provided the same technical information and support. Since a central concern of the project was the successful application of research to teacher education programs, it is important to examine the effects of the collaborative strategy that Far West Laboratory utilized. Our research question here is: How effective was the collaborative model in applying research on effective teaching techniques to preservice teacher education programs?

### Stage 2

Brought together by Far West Laboratory and provided the same amount and quality of technical assistance, each Research Fellow developed and implemented a different research/intervention project. A central focus of this analysis is a comparison of these projects. The research questions are: What variables are associated with the development and intervention of the three research/intervention projects? How do these variables interact to influence the research/intervention projects?

### Stage 3

The third key process relevant to this study is the effect of the various strategies for applying research to teacher education programs on the behavior of teachers in the classroom. In that section of the paper, we examine the relative effectiveness of

the three strategies for changing teachers' behaviors. The research question here is: What factors in the research intervention strategy can be associated with the varying outcomes in teacher behaviors?

#### Stage 4

Finally, we examine the effects of the involvement of the three teacher education programs and the local school districts in this program on their continued cooperating relationship to train both preservice and inservice teachers. Here our central research question is: How has the Far West Laboratory intervention changed the approaches that these teacher education programs and local school districts use to apply effective instruction research in teacher preparation? This stage of the conceptual framework is based on the continuing effort to establish and promote the Teacher Education Academies and will be reported on in another document. The ultimate success of the Far West Laboratory intervention depends on continued quality teacher education programs after Far West Laboratory is no longer involved.

In the following sections of this report, we examine each of the first three stages outlined above and attempt to answer the associated research questions.

## CHAPTER TWO

### THE METHOD OF INTERVENTION: COLLABORATIVE INQUIRY

Over the past decade, research has identified a coherent body of knowledge concerning effective teaching practices (Brophy, 1979). Unfortunately, much useful research never is applied at the classroom level (Huling, 1982; Griffin et al., 1983). In response to the chronic underutilization of research on effective instruction by classroom teachers, Far West Laboratory developed the interactive research and development on teaching (IR&DT) model (Tikunoff, Ward, & Griffin, 1979). Researchers at Far West Laboratory discovered that because much research is carried out in the lexicon and according to the agenda of professional researchers and their funding agencies, classroom teachers generally find it to be incomprehensible or irrelevant to their everyday tasks (Tikunoff & Mergendoller, 1983:2). As teachers generally are excluded from the research process, they are relegated to the role of consumers of research which may not be either comprehensible to them or relevant to their work. Tikunoff & Mergendoller (1983) have argued that the exclusion of teachers from the research process accounts for the underutilization of research findings in classroom instruction.

The interactive research and development on teaching (IR&DT) model was developed to correct this problem by incorporating teachers into the research process along with professional researchers and individuals responsible for staff development. In

the application of the IR&DT model, researchers, teachers, and staff developers work as equal members of a team to develop a research project and, concurrently, a staff training program in a local school district.

Tikunoff and Mergendoller (1983) found positive results of collaborative research efforts in two different sites. Besides producing tangible and relevant research findings, the participants developed a more critical, reflective eye toward their own work and institutions, developed collaborative and discussion skills, and grew professionally. In addition, teachers, researchers, and staff developers came to understand and respect one another's work. In another study carried out at the Texas Tech University Teacher Corps, teachers who participated in a collaborative research project became more comfortable with the research intervention and more creative in their application of the innovation than teachers in a control group (Huling, 1982). Additionally, teachers in this study who took part in the collaborative process noted that they would be much more willing to use research after their experience than they had been before hand. Finally, in another study which examined the contextual variables affecting the success of the IR&DT models, the researchers found a common outcome of all participants across sites was a "powerful, unmatched opportunity for growth" (Lieberman & Noto, 1983:18).

Given these experiences with collaborative modes of inquiry in overcoming the obstacles to the application of research to teachers' classroom activities, Far West Lab decided to attempt to adapt the collaborative process in its ARTE: RUETE project.

The IR&DT model seemed appropriate for our work with teacher education faculty for the very same reasons that it was first developed for work with classroom teachers. Research has shown that teacher educators, like classroom teachers, do not apply research to their own teaching in any systematic way. Carter (1981: 54-55) found that the knowledge base of teacher educators is extremely diffuse, that there is little agreement regarding either a central core of information or the procedures for teaching it. In fact, most teacher educators learned to teach either by "doing it" or by "modeling others" (Carter, 1981:48). Few faculty actually used relevant research to inform their own methods. In another study, Fieman-Nemser and Ball (1984) argue that the lack of the use of research by classroom teachers can be explained by misleading and confusing views about the proper use of formal knowledge propagated by teacher educators.

Our own findings at the three institutions of higher education (IHEs) in this study, Mills College, the University of Utah at Salt Lake, and the University of Nevada at Reno, showed a similar lack of systematic and effective use of the research on effective instruction. In Utah, a survey of teacher education faculty found little knowledge of relevant research. At the Nevada site, a number of the faculty were teaching certain techniques identified as effective in the literature, but there was no systematic use of the research in curriculum development. At Mills, faculty members in the elementary education program were using research on child development but little on effective teaching strategies. Thus, in all of our three sites, the teacher education faculties were not

accustomed to applying research systematically in their teacher education programs. The IR&DT model is especially suited to this type of situation as it does not simply impose research findings on the participants, but rather allows them to determine the type of research relevant to their own programs.

Moreover, a primary goal of the entire ARTE: RUETE project is the ongoing application of research findings in both the teacher education programs and the local educational agencies' inservice training. To this end, the final outcome of our activities will be the establishment of Teacher Education Academies (TEAs) at each of the three sites. Although the three academies will differ somewhat depending on local needs, all three will be collaborative processes between the university and the local education agency; each will be made up of teacher educators and local district personnel responsible for recruiting and inducting new elementary school teachers. We expect that teachers from the district and student-teachers also will be involved in the collaborative process. In essence, the teacher education academies will be ongoing collaborative programs at the local level. Moreover, after the 1984-85 school year, these academies will be functioning independently of Far West Laboratory. It is imperative, then, that the regional research fellows, who will be establishing and heading up these academies, have developed the skills of collaborative inquiry before they establish the TEAs. The IR&DT model, as much research has demonstrated, provides just these skills.

The interactive research and development on teaching model provided Far West Laboratory with a catalyst for encouraging

professionals who are not systematically using research in their work to do so. Moreover, a by-product of the IR&DT model, the development of collaborative inquiry skills, was a central goal of the research intervention. The IR&DT model, then, appeared appropriate for our work with the Research Fellows.

A central assumption underlying our choice of the collaborative process for the application of research to teacher education programs was that the regional research fellows would choose relevant research and apply it to the programs at their home institutions. In order to assist them in doing so, Far West Laboratory took the responsibility of acting as a catalyst for the research fellows by initiating the process, providing the fellows with relevant information, and professional and collegial support. At the same time, our review of the literature on the collaborative process made it clear that in adapting the IR&DT model to this situation, it would be imperative that the research on effective teaching strategies at each of the institutions of higher education take place concurrently with attempts to apply the research in the student teachers' classrooms to ensure its applicability to the teacher training programs, that the research fellows and Far West Laboratory staff work together as a team in which all members had an equal voice, and that the research intervention process respect the integrity of each of the fellow's home teacher education program so as not to force irrelevant research on the program (Tikunoff & Mergendoller, 1983:8-10).

Far West Laboratory provided the catalyst for the application of research on effective teaching to the teacher training programs

of the three institutions by bringing the research fellows together in the Regional Teacher Education Team. Researchers at Far West conceived the idea of establishing a formal mechanism which incorporated the IR&DT model for applying research to teacher education programs. It was Far West Laboratory that provided the Research Fellows with both the organizational structure and the monetary support to pursue their research interests in the field of teacher education. All three Research Fellows agreed that they never would have undertaken a research project the scope of this one without the intervention of Far West. Moreover, the Research Fellows' affiliation with a prestigious national research laboratory provided their research projects a certain amount of credibility at both their home institutions and with the local school districts. Finally, participation in the Far West-sponsored project held out the potential for professional growth and advancement for each of the participating Research Fellows. As one Research Fellow put it, "an important criterion for my participation was the opportunity for promotion in my department". In essence, the ARTE: RUETE project, as an organized and on-going vehicle for research, provided the necessary catalyst to move teacher educators from three separate institutions to begin to apply the research on effective teaching to their own programs.

The second important feature of the collaborative process is the provision of relevant information to the participants. Throughout the twenty months of this project, Far West Laboratory has been the major source of information for the Fellows. In the first two meetings of the RTET, Far West Laboratory introduced the Research Fellows to the relevant literature on the IR&DT model and

to the research on effective teaching practices. The Fellows were provided with a series of scholarly articles and experts from various fields briefed the Fellows on the intricacies of the research findings. Additionally, the Laboratory trained the Fellows in appropriate research techniques including development and use of instruments to monitor teacher activities in the classroom. Finally, throughout the development and the implementation of their individual research projects, Far West Lab has continued to provide the Fellows with relevant technical support (for example, the training of research assistants in observation techniques) as well as additional literature on the specific research the Fellows chose to utilize in their projects.

While the original catalyst and structure for the Regional Teacher Education Team (RTET) came from Far West Laboratory, the collaborative process required that subsequent activities be developed by the team as a whole. Thus, once the background on the collaborative process and the research on effective teaching were presented, the research fellows began to play an equal role with Far West Laboratory staff in the further development of RTET activities. From the survey of research on effective teaching strategies, the Research Fellows chose two specific strategies, Academic Learning Time (ALT) and Active Teaching Behaviors (ATB) to study in-depth. Together with Far West Laboratory staff, the Fellows adapted specific instruments to measure the amount of ALT and ATB taking place in a particular class.

Furthermore, from the very first meeting of the RTET, the Fellows were asked to share relevant information concerning their

home sites. At that initial meeting, the Fellows developed an outline for their situational analyses, in-depth reports on the existing content and process of the teacher education programs at the three sites. While the individual Fellows collected the data for and wrote the situational analyses on their own institution, these analyses went through extensive review by the other Research Fellows, other faculty at their home institution, a representative from the local school district, and Far West Laboratory staff. Before these analyses were complete, they had gone through several complete drafts.

There were a number of purposes to this extensive process. First, the situational analyses provided the Fellows with the baseline data from which to begin to develop their research intervention plans. Second, the process of analyzing their own institutions allowed the Fellows to begin a critical examination, in cooperation with their fellow faculty members and local school personnel, of their present teacher education programs, their cooperating school districts, and the historical relationship between the two. Third, through reading and discussion of each other's analyses, the Fellows became acquainted with one another's institutional settings. Fourth, the formal introduction of each Fellow's research context assured that the particulars of that context would be understood and respected by other members of the team as they worked toward developing research intervention strategies. Finally, and perhaps most importantly, this process of reviewing, criticizing, and rewriting marked the beginning of the formal collaborative process which was to continue throughout the

duration of the project.

This same process took place as the Research Fellows began to develop their research intervention plans after the second RTET meeting. Based on the review of the research on effective teaching which took place in the first two meetings and on the baseline data specific to their home institutions which they developed in their situational analyses, and using instruments developed collaboratively by the RTET, the Research Fellows returned to their home institutions and began to establish specific strategies for applying the research in their teacher education programs. These plans were reviewed by all other members of the team, criticized, and discussed in a subsequent meeting. The Fellows then rewrote the research intervention plans and resubmitted them to one another for further review. Similarly, as the Fellows began to implement their research plans, difficulties and promising strategies were communicated among members of the team, technical support was provided where needed, and the Fellows revised their plans when input from other members appeared relevant.

Thus, while the original catalyst and structure for the activities of the RTET was provided by Far West Laboratory, the actual development and implementation of the research intervention plans resulted from a collaborative process among team members providing mutual support for one another as they worked as equals toward a common goal.

CHAPTER THREE  
DESCRIPTION AND CROSS-SITE ANALYSIS OF THE  
RESEARCH/INTERVENTION PROJECTS

As noted earlier in this report, all three Research Fellows underwent the same experiences as members of the Regional Teacher Education Team (RTET), receiving virtually the same training and technical assistance from the Far West Laboratory staff. Even so the Research Fellows developed significantly different plans for applying the research on effective teaching strategies in their respective institutions' teacher education programs (Driscoll, 1984; Johns & Gee, 1984; Ponzio, 1984). In this chapter, we describe each of the three research/intervention projects, outline the variations among them, and analyze the factors that influenced those variations.

Utah

Setting

The University of Utah, Salt Lake City has the largest publicly funded teacher education program in the state of Utah. The elementary and early childhood program has 260 students. The majority of students are over 25 years of age and are married. There are a 15 full-time faculty members in the elementary/early childhood education program. The typical faculty member is over 45 years of age and holds an undergraduate degree in education.

Preliminary interviews with student teachers and faculty at

Utah revealed little or no knowledge of research on effective instruction. Neither faculty nor students were able to identify major researchers in the field of effective instruction research. Furthermore, the teacher education faculty reported limited use of effective instruction research in their course work. Interestingly, cooperating teachers from the cooperating school district in this study, Salt Lake City, did possess a basic knowledge of the research on effective instruction.

The student teaching practicum at the University of Utah has been organized through an ongoing collaborative relationship with seven local elementary schools in three local school districts: Granite, Jordan, and Salt Lake City. These seven schools are known as Professional Development Centers (PDCs). They were chosen based on the quality of the schools, representation of socioeconomic status and cultural diversity of their student populations, location, and teachers' and principals' commitment to working with student teachers. All student teaching occurs in these schools.

### Goals

The general goal of the research/intervention plan at the Utah site was to alter the teacher education program to include the application of the research on effective teaching strategies. More specifically, the plan was devised to: a) engage prospective teachers in a systematic examination of their practices and efforts to improve them; b) to engage teacher educators in small scale but persistent inquiry into their own practices and their contributions to teacher quality; and c) to foster fruitful collaboration between the local school district and university in the preparation of teachers.

### Sample Selection

The sample for this study consisted of 12 preservice teachers in the elementary education certification program at the University of Utah, Salt Lake City, four teacher education faculty from the same institution, and four experienced cooperating teachers from the elementary schools in the Salt Lake School District. All members of the sample volunteered to take part in the study.

### Methodology

The 12 preservice teachers were randomly assigned to three groups: Treatment Ast, those who were to participate in a collaborative planning session and the preservice instruction; Treatment Bst, those who were to receive just the preservice instruction; and, Treatment Cst, the control group, which would neither take part in the collaborative session, nor in the preservice instruction.

In July of 1983, the four student teachers in treatment group Ast, the four teacher education faculty, and the four cooperating teachers took part in a four day collaborative meeting. The agenda for that collaborative session consisted of a review of major topics in the research on effective instruction, selection of one topic for a research development focus, and the development of a preservice instruction plan.

The participants collaboratively selected the research findings on active teaching behaviors (Good, 1979, 1983) as most salient for preservice teacher education. Following this decision, participants developed a preservice instruction plan consisting of a review of the research on active teaching behaviors (ATB),

extensive observation of videotapes for identification and recording of ATB, assessment of lesson plans for ATB, and role playing active teaching behaviors with peers. Additionally, ATB observation forms were to be used in self-observation, observations of peers and cooperating teachers, and by university supervisors of student teachers.

In September of 1983, the preservice instruction plan developed by the team of teacher education faculty, student teachers, and cooperating teachers was implemented as part of the "Early Experience" session designed for fall quarter student teachers. The "Early Experience" session is a nonmandatory four-week, student pre-teaching program consisting of half-day attendance in classrooms, observations, mini lessons, and seminars with teacher education faculty. The preservice instruction on active teaching behaviors consisted of four sessions, two hours each, in the following format:

Session 1 (first week) - Introduction to the research on ATB; observation via videotapes.

Session 2 (second week) - Extensive observation via videotapes; discussion of ATB.

Session 3 (third week) - Review of lesson plans for inclusion of ATB; observation of videotapes; discussion of Missouri Mathematics Effectiveness Project.

Session 4 (fourth week) - Role playing of lesson plans to demonstrate and critique use of ATB; summary discussion and evaluation.

### Hypotheses

Two specific null hypotheses were posed:

- 1) Student teachers who participate in the collaborative development of preservice training using the research findings on

effective instruction will not differ significantly in their ability to demonstrate the teaching behaviors identified in the preservice training from those students teachers who do not participate.

2) Student teachers who participate in the preservice training using the research findings on effective instruction will not differ significantly in their ability to demonstrate the teaching behaviors identified in the preservice training from those students who do not participate in the preservice training.

#### Data Collection

The three sample groups of student teachers, Ast, Bst, and Cst, were observed during mathematics instruction for three one-hour sessions. Observations recorded the incidence of active teaching behaviors using an instrument developed by the Regional Teacher Education Team at Far West Laboratory. This instrument contains 20 teacher behavior items in four teaching categories: introduction, instruction, closure, and management. Recordings were made every 60 seconds, and included notation of incidence, additional behaviors observed, and a narrative description for each session. Observations and recordings were done by two trained observers who were research assistants. Training was done with the ATB observation instrument. Training proceeded until observers reached 90% inter-rater agreement. Finally, nine months after the initial collaborative session, student and cooperating teachers were interviewed by the Research Fellow in order to measure the long term affects of their participation in the intervention.

### Data Analysis

The four teacher behavior categories of the ATB instrument in the frequency of individual behavior items were used. A chi square test with three degrees of freedom was used to analyse the statistical significance of the differences among groups.

### Mills College

#### Setting

The teacher education program at Mills differs significantly from the programs at both Utah and Nevada in two important ways. First, the teacher education department of Mills is primarily a graduate level program; on the undergraduate level, Mills is a women's liberal arts college. Second, the Mills program is very small. There are only 13 credential candidates in the whole program. The students are between 25 and 30 years of age; approximately one third are married. There are three faculty members in the elementary education program.

Preliminary interviews of student and cooperating teachers revealed some familiarity with the concepts found in the research on effective instruction. None of the teachers, however, had worked with the research firsthand. None of the faculty members at Mills had read extensively about any of the topics in the research on effective instruction, and only two had applied the literature in any form to their assessment of student teachers' performance. Moreover, Mills faculty did not require student teachers to apply effective instruction techniques in their teaching assignments.

The elementary schools traditionally used in the credential

program include schools in the Oakland, Piedmont, and Vallejo public school systems. The Vallejo schools were recently added to the group of cooperating schools because of the development of reciprocal professional work with Mills College. Moreover, the Vallejo school system has one of the most outstanding professional development programs for teachers in the state of California.

The number of schools participating in the teacher education program is limited in order to place several students at one site, where they can share their perceptions and assist one another in videotaping. As a result of concentrating teachers in a few schools, a cadre of cooperating teachers who have shared in evaluating and developing the Mills program is available for student teachers.

### Goals

The research intervention plan at Mills College in Oakland, California, was designed to study the effects of the application of research on effective teaching in the preparation of prospective elementary school teachers. More specifically, project leaders hoped to improve the teaching of student teachers in Mills College's preservice training program, and to enhance the communication between student teachers and their cooperating teachers.

### Initial Planning

The Mills Research Fellow took a somewhat different approach to the development of a research intervention plan. Here, the Research Fellow first established an advisory group. Initially, this group consisted of the Mills College Fellow, a colleague on

the Mills faculty, a visiting scholar at Mills, the project director from Far West Lab, and the Staff Development Coordinator from the Vallejo City Unified School District. Throughout the development and implementation of the research strategy, the Fellow turned to members of this advisory group for assistance.

In consultation with the Vallejo Staff Coordinator, the Mills Fellow identified a single school as a site for the intervention. The Fellow, then, hired two research assistants, one the Instructional Assistant from the participating school, the other a highly regarded teacher in Vallejo who has since begun a doctoral program. With these two additional participants, the visiting scholar at Mills and the Research Fellow functioned as a research team.

In early September, the research team came together with members of the advisory group. The Project Director from Far West Laboratory introduced and the team reviewed the literature on academic learning time (ALT) (Fisher et al., 1978, Fisher et al., 1980) and on active teaching behaviors (ATB) (Good, 1983). Members of the research team were trained in the use of ALT and ATB observation instruments to an inter-rater agreement of .90. Collaboratively, the research team reviewed the course syllabi in the Mills teacher education program and developed a plan for introducing these concepts to student and cooperating teachers.

### Sample Selection

The sample of student teachers consisted of five preservice elementary credential candidates at Mills. The team also selected five cooperating teachers from one of the Vallejo schools, all of whom came from the preferred pool of teachers consistently used by

the Mills teacher education program. All 10 participants were volunteers. Additionally, the Mills' faculty and the two research assistants remained involved in the intervention.

### Methodology

The five student teachers and five cooperating teachers were paired together, one student teacher being assigned to each cooperating teacher. Ten days after the student placement, and prior to any introduction to academic learning time (ALT) or active teaching behaviors (ATB), the research assistants observed both student and cooperating teachers to collect baseline data on both ATB and ALT in the classrooms. Subsequent to the baseline data collection, cooperating and student teachers took part in a three day training on academic learning time and active teaching behaviors. The training was presented by the collaborative research team, including the Research Fellow, the two research assistants, and one faculty member from Mills.

During the training, the student teachers and cooperating teachers were presented with the research on effective instruction related to ATB and ALT. The teachers viewed videotapes, observed classrooms, and took part in coding sessions. ATB and ALT observation instruments which had been developed at Far West Laboratory were used to train the teachers in the use of systematic observation techniques. The training provided ample practice and instruction to develop a consistently high level of inter-rater agreement.

In addition to the three day training, the semester-long student teaching experience was used as an important element of the observation process. As an integral part of this experience, the

student and cooperating teachers were asked to assess each other using the observation instruments introduced in the initial training. They were also requested to schedule weekly conferences to provide each other feedback, using the observation forms as a basis for discussion. The cooperating teachers provided the Research Fellow with summaries of these weekly meetings.

### hypotheses

Three specific hypotheses were posed:

1) Student teacher and cooperating teachers who are trained to assess ALT and ATB will increase their instructional effectiveness in math.

2) Student teachers and cooperating teachers who are trained to assess ALT and ATB will increase the ratio of ALT in their math lessons as measured two months after the training session.

3) Increased knowledge of research related to ALT and ATB will change the supervision of student teachers by their cooperating teachers through: specificity of feedback; increased reciprocity of feedback between the cooperating teacher and student teacher; and, the development of a common lexicon related to the feedback.

### Data Collection

Both quantitative and qualitative methods were used to collect data on the research intervention plan. Utilizing the ATB and ALT instruments developed at Far West Laboratory, the research assistants observed the cooperating and student teachers both before and after the intervention. In addition, cooperating and student

teachers wrote paragraphs before and after the intervention concerning their knowledge of ATB and ALT. Finally, after the conclusion of the project, the student and cooperating teachers, the Research Fellow, and one of the research assistants, were interviewed by a visiting scholar on the Mills' faculty.

### Data Analysis

The pre- and post-intervention frequencies of both ATB and ALT, collected by the research assistants using observation instruments, were compared for each student and cooperating teacher. A test of significance was utilized to examine the actual differences in individual behaviors overtime. The research Fellow supplemented this quantitative data with an analysis of the teachers' pre- and post-intervention writings and of the interview data collected by the visiting scholar.

## Nevada

### Setting

The University of Nevada, Reno is the sole four-year institution of higher education in northern Nevada. The College of Education has approximately 900 students; of these, approximately 30 each year student teach. The typical elementary student teacher is female, single, and 26 years old. There are five full-time faculty members in the elementary school program. The great majority of these have more than 15 years experience and will be retiring within the next two years.

Preliminary interviews of the student teachers at Nevada showed most students had not encountered effective instruction

topics in their course work and student teaching. A majority of interviewed faculty indicated that they did introduce the topic of active teaching behaviors in their classes. These faculty were not, however, familiar with most of the topics of effective instruction research.

The relationship between the University of Nevada's teacher education program and the local educational agency, the Washoe County School District, is overseen by the Professional Advisory Board. Membership on the board includes school administrators, public school classroom teachers, and College of Education faculty. While the Washoe School District encompasses a number of rural schools, over 90% of the student teachers from the University of Nevada are placed in the urban center of Reno. The College of Education has made every effort to avoid the repeated utilization of a select few cooperating teachers. In the Reno schools, the student teacher is generally considered to be an asset to the school and the cooperating teacher. Therefore, the regular assignment of student teachers to the same classrooms is avoided in order to balance harmony among teachers within the district.

### Goals

The Nevada research intervention plan, like that of both Utah and Mills, sought to apply research on effective teaching methodology to the site's teacher training program in order to improve its student teachers' performance in the classroom. Unlike the other two cases, however, the Research Fellow in Nevada focused on the development of an efficient method of effecting changes in teacher behavior. Specifically, the Nevada Fellow explored whether

it was necessary to provide student and cooperating teachers with extensive training in the use of effecting teaching strategies in order to effect the use of such strategies.

### Sample

In this case, all 28 cooperating teachers in the school district who were to supervise student teachers in their classroom in the Fall 1983 semester were asked to participate in the research activity. All 28 teachers agreed to do so. The 28 student teachers were also included in the project as a part of their regular student teaching experience. As in both Utah and Mills, the topic of mathematics was chosen because of the relatively clear-cut instructional behaviors, the generally limited number of concepts introduced at one time, and because previous research on active teaching behaviors had been most frequently conducted on mathematics instruction.

### Methodology and Data Collection

Beginning in early September, each cooperating teacher was observed on two days while teaching mathematics. Immediately following those observations, each student teacher was observed one time while teaching mathematics. The active teaching behaviors instrument developed at Far West Laboratory was used for these observations. After each observation, a summary statement describing the general procedures employed in the classroom was recorded and then transcribed. These procedures provided both a quantitative and qualitative record of the classroom.

The Research Fellow rank ordered all the cooperating teachers

according to their level of exhibited active teaching behaviors. These teachers were divided into two categories, those demonstrating high ATB, and those demonstrating low ATB. The Research Fellow then assigned all cooperating teachers to one of four separate treatment groups. The first group consisted of one-half the cooperating teachers who had exhibited high levels of ATB and who were to be provided with the ATB instrument which had been used to observe their teaching. The second group included the other half of the high ATB teachers; this group, however, was not going to receive the observation instrument. Similarly, the cooperating teachers with low ATB were broken up into two groups, one which was to receive the observation instrument, and one which was not. The 28 student teachers had previously been randomly assigned to a cooperating teacher in one of the four groups without regard for the level of teachers' ATB.

Beginning in November 1983, the Research Fellow provided the ATB observation instrument to the two groups of cooperating teachers (one high in ATB, one low) and asked them to use it in observing the student teacher during the latter's mathematics instruction. The cooperating teacher also was asked to share the observation sheet with the student teacher and to provide the student teacher with a set of definitions and examples of the behaviors to be observed. There was no formal training for the cooperating teachers in how to use the instrument.

In late November, the two control groups of student teachers (those who were with cooperating teachers who did not have the observation instrument) were observed one time to assess their use

of active teaching behaviors. Immediately afterward, those student teachers who had been introduced to the observation instrument were observed one time for post-intervention data.

All observations of student and cooperating teachers were conducted by the same research assistant. This observer had been trained in the use of the Far West Laboratory ATB observation instrument with videotapes and actual classroom situations. Observer agreement was .89. The trained observer was not informed which of the student teaching sites were designated high or low ATB.

#### Research Questions

Three specific research questions were addressed:

1) Given the association of a cooperating teacher strong in the use of active teaching behaviors (ATB) with a student untrained in ATB: Will the student internalize and manifest those behaviors without the intervention of an ATB observation instrument which focuses on active teaching behaviors?

2) Similarly, will the use of an observation instrument yield a higher level of the use of ATB in the student teacher who is associated with the cooperating teacher who is high in ATB?

3) Conversely, given the association of a cooperating teacher low in the use of active teaching behaviors with a student teacher untrained in ATB: Will the use of the ATB observation instrument cause the student teacher to display higher levels of ATB than a student teacher in a similar pairing, but not using the ATB observation instrument?

### Data Analysis

As a result of incomplete observations and loss of student teachers, the final sample size consisted of 21 pairs of student and cooperating teachers. Differences in frequencies of active teaching behaviors pre- and post-intervention were analyzed for each of the four treatment groups. Variation in differences among the four groups were then compared. Each data cell was submitted to a chi square test of significance with three degrees of freedom.

### Variations Across the Projects

An overview of the three R/IPs shows that all three sought to improve the effectiveness of teachers through the application of the research on effective teaching to their teacher education programs. All three chose to work with the research on active teaching behaviors. All three developed quasi-experimental intervention plans which separated their samples into a variety of treatment groups. At all the sites, some degree of control was established either by the use of pre-intervention observation or by the use of control groups. Research assistants and the three Research Fellows collected both qualitative and quantitative data on the use of active teaching behaviors, using the same ATB instrument developed at Far West Laboratory. Finally, all three Research Fellows measured the effect of their particular intervention by comparing frequencies of active teaching behaviors either pre- and post-intervention or between control and treatment groups.

Despite their similarities, however, the three research/intervention projects represented significantly different approaches

to applying the same research. These differences are most marked in the goals of the three projects, the methods by which the intervention plans were developed, and the ways in which the projects were implemented.

The purpose of this section is to examine the specific differences among the three research/intervention projects. The characteristics of each project as described in the previous sections are summarized in Table 1 to aid in the following discussion.

### Goals

Although the general goal of the three R/IPs was the same, the projects differed significantly in their more specific operationalized goals. Utah's was the most ambitious of the three plans. The team at Utah sought to engage both student teachers and teacher education faculty in a systematic examination of their own practices, in an effort to improve them. Moreover, the plan hoped to foster a more collaborative relationship between the local school district and the teacher education program. The Mills project sought to improve the communication between student and cooperating teacher with the hope that, in combination with the use of effective teaching strategies, such communication would further improve student teacher performance. The goal of the Nevada plan was less far reaching than either of the other two. Here the plan focused on examining the utility of a simple intervention strategy in effecting changes in student teacher behaviors.

### Method

The method by which the research/intervention plans were

Table 1  
Variation in Research/Intervention Projects

	<b>SITES</b>		
	<b>Utah</b>	<b>Mills</b>	<b>Nevada</b>
<b>SAMPLE SIZE</b>			
Student Teachers	12	5	21
Cooperating Teachers	12	5	21
Teacher Education Faculty	4	2	1
<b>DATA COLLECTION TRAINING</b>	<p><u>July 1983</u></p> <p>One 4-day collaborative meeting of student teachers, cooperating teachers, teacher education faculty, and Far West Laboratory staff</p> <p><u>August 1983</u></p> <p>4 two-hour Early Experience sessions for student teachers by teacher education faculty</p> <p><u>October 1983</u></p> <p>2 days for re-search assistants by Far West Laboratory staff</p>	<p><u>September 1983</u></p> <p>4 days for teacher education faculty and re-search assistants, by Far West Laboratory staff</p> <p><u>September 1983</u></p> <p>3 days for student teachers and cooperating teachers by teacher education faculty and re-search assistants</p> <p><u>On going</u></p> <p>Student teacher/cooperating teacher feedback with teacher education faculty</p>	<p><u>September 1983</u></p> <p>2 days for research assistant and teacher education faculty by Far West Laboratory staff</p> <p><u>On going</u></p> <p>Cooperating teachers use of observation instrument</p>
<b>OBSERVATIONS</b>	<p><u>October 1983</u></p> <p>4 student teachers Group A (Collaborative Session)</p> <p>4 student teachers Group B (Early Experience)</p> <p>4 student teachers Group C (Control)</p> <p><u>December 1983</u></p> <p>4 student teachers Group A (Collaborative Session)</p> <p>4 student teachers Group B (Early Experience)</p> <p>4 student teachers Group C (Control)</p>	<p><u>September 1983</u></p> <p>5 student teachers (pre)</p> <p>5 cooperating teachers (pre)</p> <p><u>December 1983</u></p> <p>5 student teachers (post)</p> <p>5 cooperating teachers (post)</p>	<p><u>September 1983</u></p> <p>28 cooperating teachers</p> <p>21 student teachers</p> <p><u>November 1983</u></p> <p>21 student teachers</p>
<b>SUBJECT/CLASS OBSERVED</b>	Math, direct instruction	Math, direct instruction	Math, direct instruction

developed at the three sites can be differentiated by their relative extensiveness, the number of interested parties involved, and the degree of collaboration among the responsible parties.

Again, the Utah plan stands at one end of the continuum. Here, the Research Fellow invited four student teachers, three members of the teacher education faculty, and four cooperating teachers to take part in the planning of the research intervention. The project paid for University credit for the cooperating teachers. This team collaboratively examined the research on effective teaching, selected a specific topic most relevant to their work, active teaching behaviors, and developed an extensive preservice instruction plan. The research intervention, then, was the result of a collaborative effort on the part of representatives of all groups which were to take part in the intervention.

At Mills College, the initial planning was similar in as much as the research strategy was developed with the input of representatives from the relevant parties. The advisory group included a member of the Mills College faculty, a visiting scholar at Mills, the project director from Far West Laboratory, and the Vallejo Staff Development Coordinator from the participating school district, Vallejo City Unified. The research team consisted of the Research Fellow, the visiting scholar at Mills, the Vallejo Staff Development Coordinator, and two research assistants, both certificated employees of the school district. This smaller team, then, reviewed the literature on effective instruction and assisted the Research Fellow in developing a research intervention plan. The Mills and Utah teams differed, however, in both the degree of

collaboration and the composition of the teams. Through the first stages of the initial planning stage, the Mills Fellow made a number of important decisions (the school site, the focus on ALT and ATB, for example) without the collaborative input of all members of the research team. Once the team was established and working collaboratively, neither cooperating teachers nor student teachers took part in planning sessions.

The development of the research/intervention plan at the Nevada site stands in stark contrast to the two others. Here, the Research Fellow basically developed the intervention on his own. While he did consult with both the superintendent and the staff development officer in the local school district, he held sole responsibility for its development. No other faculty members, student teachers, cooperating teachers, or local district personnel played an active role in the creation of the intervention strategy.

### Implementation

The way in which the research on active teaching behaviors was introduced into the teacher education program at the three sites can be differentiated by the extensiveness of the intervention, its place in the preservice experience, who took part in the training, and the degree of control over the introduction.

At the Utah site, the training took place during the voluntary four-week, pre-student teaching program. Eight student teachers took part in the preservice training. Four of these had been involved in the collaborative team that designed the training sessions, and so were already familiar with the concepts of active teaching behaviors. The preservice training consisted of two-hour

sessions, one day a week, over the four-week period. The Research Fellow and her colleagues at University of Utah introduced the student teachers to the literature on active teaching behaviors; the student teachers then observed videotapes of teachers using ATB methods and wrote lesson plans based in the ATB methodology. These plans were criticized, and then the student teachers "taught" one another using ATB.

Five student teachers and their five cooperating teachers took part in the Mills preservice training. The training took place over a three day period during the first month of the student teaching experience. In order to allow the cooperating teachers to attend the training, the project paid for substitute teachers for their classes. The Research Fellow, two faculty members from Mills, and the two research assistants presented the literature on active teaching behaviors. The student and cooperating teachers viewed videotapes, observed actual classes, and practiced coding using the active teaching behaviors instrument designed at Far West Laboratory.

Importantly, the intervention at Mills continued throughout the student teaching semester. The cooperating teachers were asked to hold weekly meetings with the student teacher during which they were to provide one another with feedback on their use of ATB.

The Nevada research/intervention plan was designed to be much less extensive than either the Mills or Utah plans. In November of the fall semester, the Research Fellow visited the classes of the two treatment groups of cooperating teachers and provided them with the ATB observation instrument. The Fellow requested that the

cooperating teachers use the instrument to observe the student teachers. Furthermore, the cooperating teachers were asked to share the observation sheet with the student teacher and to provide both definitions and examples of the behaviors. There was, however, no formal training for the cooperating teachers in the use of the instrument.

### Factors Influencing Variation Across Sites

A central facet of the design of Far West Laboratory project was the provision of latitude to the Regional Research Fellows to develop intervention strategies relevant to their respective teacher education programs. As we noted in the previous section the result of this freedom was the creation of broadly different intervention plans in the three sites. While it may be inevitable that three different researchers from three separate institutions would develop differing plans even given the same information and technical support, we believe it is informative to explore this variation across sites. As federal, state, and local educational agencies search for innovative ways to improve the education of tomorrow's teaching force, their policy decision should be informed by an understanding of the structural factors that influence attempts to apply research findings in teacher education programs.

Clearly, the differences we found in the research intervention plans in Utah, Nevada, and Mills are a function of the specific goals established by the teams and individuals at those sites. We argue, however, that the variation in the manner in which the research plans were developed, in the specific goals of the interven-

tions, and in the interventions themselves is a function of variation in particular contextual factors. Specifically, we view the variation across the three sites along the following dimensions: the characteristics of the teacher education program; the characteristics of the cooperating local school district; the historic relationship between the teacher education program and the local school district; and the research fellows themselves. Figure 3 schematically portrays the interaction among these various factors.

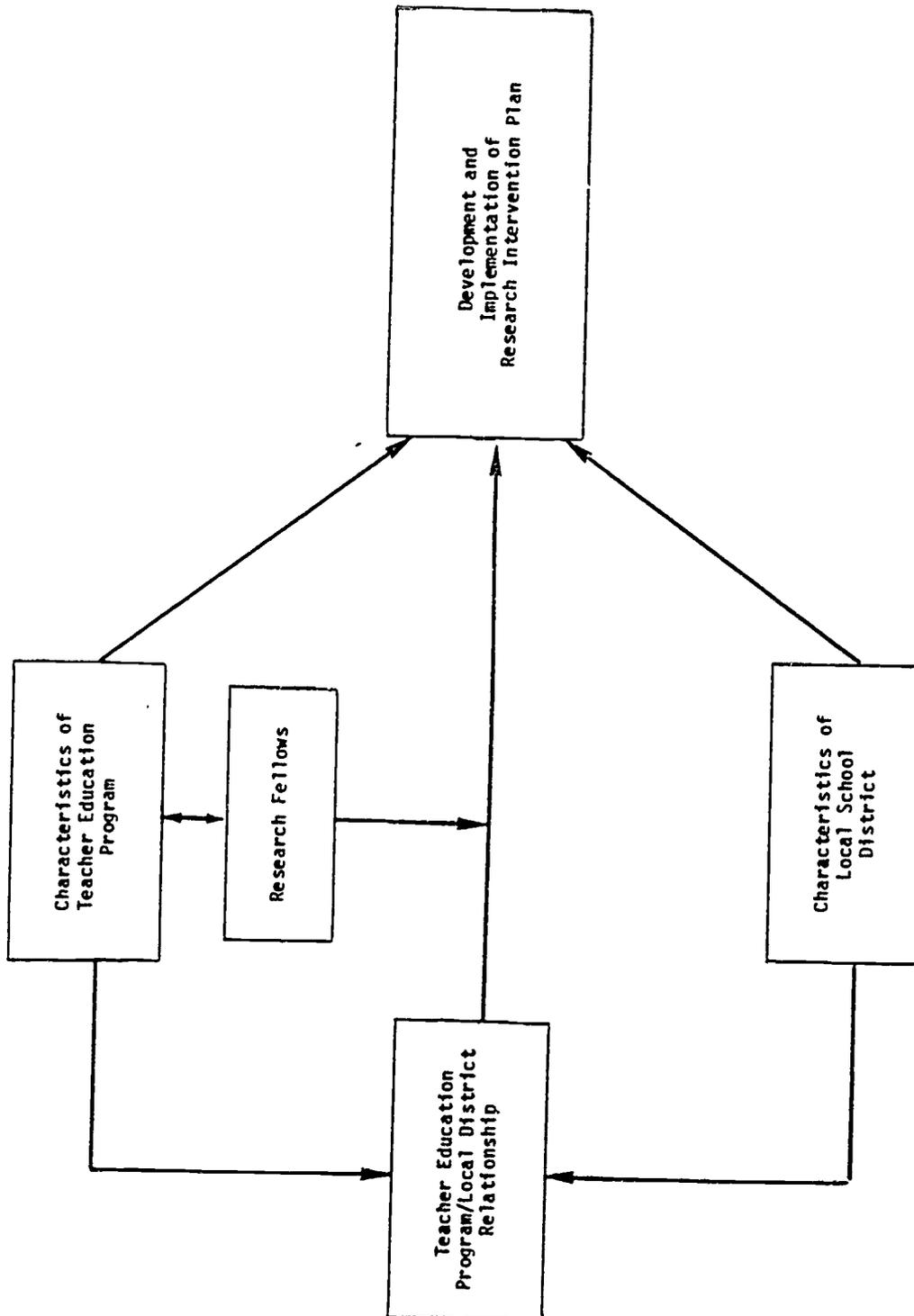
#### Characteristics of the Teacher Education Program

The existing degree of collaboration among teacher education faculty, the size of the program, and the existence of latitude in the program for the interjection of an innovative research project influenced both the development and the implementation of the research intervention plans.

At the Mills site, the small number of faculty in the education department work as a team, coordinating activities and instruction in all program areas. Collaborative planning and evaluation are the key components of the Mills program design. The elementary and early childhood program at Utah is much larger, 15 full-time faculty versus three at Mills, and such regular coordination is not feasible. The newer faculty at Utah, however, have established an informal network to support one another's professional efforts. The Research Fellow at the Utah site, herself a third year assistant professor, was able to turn to members of this group for support in her efforts to develop an intervention plan. In contrast, the Nevada Fellow noted that the faculty in his department work in isolation from one another.

Figure 3

Factors Influencing Variation Across Sites



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The effects of the tradition of interaction among the teacher education faculty in the three sites had consequences for the research intervention plan. At both Mills and Utah, the Research Fellows invited other members of their departments to participate in both the planning and the implementation of the intervention strategies. At Mills, where the interaction among the three faculty members in a small department is regular and frequently informal, the Research Fellow collaborated with his colleagues in a much less structured manner than was the case in Utah. At Nevada, the Research Fellow worked with a sole research assistant (a teacher at a local community college).

The teacher education programs at both Mills and Utah are structured in such a way as to provide faculty with sufficient latitude to interject innovative plans. At Utah, there is a four-week "Early Experience" session prior to the beginning of regular classes during which preservice teachers attend half-day classes, develop mini-lesson plans, observe classrooms, and take part in seminars headed by teacher education faculty. The Utah Research Fellow was able to utilize this less formally structured period to carry out a rather extensive four-day training period in active teaching behaviors for student teachers.

While Mills College has no structured period analogous to the "Early Experience," it has eliminated traditional course schedules. The Mills program is organized to permit flexibility in the time students spend receiving formal instruction as their classroom observation and participation in the classroom gradually increase. This more flexible schedule allowed the Mills Fellow to conduct a

three-day training period early on in the student teaching experience.

The Nevada teacher education program, while continuing to develop innovative course programs, maintains a traditional course program. Moreover, no organized period is provided when student teachers and faculty come together outside of regular classes. The Nevada Fellow, then, had no "natural" or easily created period in which he could train students as part of the research innovation plan. As the Nevada Fellow noted, if such a structured period existed, his research strategy would have been more similar to Utah's and Mills.

#### Characteristics of Local School District

In all three sites, the research/intervention plan was implemented in cooperation with a local school district. The commitment of the district to the ongoing training of teachers, especially the extent to which this commitment is reflected in specific staff development programs affected the intervention strategies in all three cases.

The Vallejo district, site of the Mills College intervention, has developed a strong staff training program over the past seven years, manifested in the establishment of a department of staff development. There is a Professional Development Center (PDC) where instructional teams, composed of teachers and administrators from a single school, come for assistance in developing better instructional programs. After these teams return to their schools, the PDC's staff provides follow-up assistance. The Vallejo district also has worked with a number of colleges and universities besides Mills on improving their staff training program. Finally, in a

number of the Vallejo schools, teachers have formed support groups in which they provide one another feedback on the effectiveness of their teaching.

The Salt Lake City Unified School District, site of the Utah plan, has also developed a number of organized, innovative programs for staff development. Among these innovations are: The Master Teacher program, a Teacher Support Center, a Peer Advisor Group (15 experienced teachers serve as mentors to first year teachers), and a Teacher Remediation Team (colleagues provide assistance to teachers who are in "professional trouble"). In addition, there are a number of PDCs based in individual schools which serve as the loci of both preservice and inservice training in the district.

The Washoe County School District, site of Nevada intervention, like the other two districts, traditionally has been committed to a strong staff development program. The Washoe program is unlike Vallejo's and Salt Lake City's, however, in two fundamental ways. First, the district has not developed the series of organized structures like development centers and peer advisory groups. Second, whereas Salt Lake and Vallejo have worked collaboratively with local teacher education programs in the development of their staff training programs, Washoe county has maintained a program with minimal university collaboration.

These differences among the three districts are reflected in the three sites' intervention strategies. Both the Mills and Utah Research Fellows had formal training structures available to them in their school districts. In the Utah case, the Research Fellow used the PDCs as the sites of her intervention, as these are located in

individual schools. The Mills Fellow worked with the head of the staff development department in choosing a school suitable to his intervention strategy. The school which was selected was one in which the teachers had come together in informal groups to critique one another's methods. Because of this manifest openness to constructive criticism, the research/intervention project in Vallejo included frequent sessions between student and cooperating teachers in which they provided one another with feedback on their use of active teaching behaviors. Such meetings were not a part of either of the other two projects. In the Nevada case, the Washoe school district, committed as it was to improving its teaching corps, welcomed the Research Fellow. There was, however, no organized structure into which to fit the research/intervention project. The resultant project was one in which communication flowed between the Research Fellow and the cooperating teachers without the aid of an established structure.

#### Relationship Between the Teacher Education Program and the Local School District

The most important factor in explaining the variation among the development and intervention of the three research/intervention projects is the traditional relationship between the teacher education program and the cooperating school district. While all three Research Fellows enjoyed excellent professional relationships with district staff responsible for the placement and training of student teachers, the formal relationships between the teacher education programs and the school districts varied widely.

In Utah, the school-based Professional Development Centers

had been developed through a collaborative effort between the school district and the university. In fact, the PDCs serve as bona fide extensions of the university in the schools. The principals of the schools in which the PDC's are located serve as adjunct assistant professors in the university's teacher education program. Moreover, an explicit function of the PDCs is to assist in the training of preservice teachers. All of the University of Utah's student teachers are placed in one of the PDCs (there are PDCs in other school districts as well). Generally, the same group of cooperating teachers and administrators work with the Utah teacher education program in the placement and training of student teachers overtime.

The relationship between the Mills College teacher education program and the Vallejo school district is not as structured as that in the Utah case. In Vallejo, the PDC is based in the central district rather than in the schools. Still, the teacher education faculty at Mills has worked with the district staff development department in selecting a group of schools in which to place student teachers. Over time, this group of schools has stabilized somewhat, providing the Mills program with a cadre of experienced teachers and administrators with whom to work year after year.

The University of Nevada, Reno, does have a formalized relationship with the Washoe school district through the Professional Advisory Board. The board, composed of school administrators, classroom teachers, and College of Education faculty, maintains open lines of communication between the schools and the college. It also participates in a yearly recognition of outstanding student teachers

and cooperating teachers. Yet, while this formal advisory board exists to oversee the relationship between the teacher education program and the school district, the method of placing student teachers in the district's schools has mitigated against the establishment of formal cooperation among a continuing corps of district teachers, administrators and college faculty. The college and the district have worked to distribute student teachers among as many schools as possible, and within those schools, among as many teachers as possible. The resulting relationship of this practice is the exact opposite of that in Utah and Mills where specialized cadres of administrators and cooperating teachers have been developed over the years. In Nevada, from one semester to the next, the college faculty generally are dealing with different schools, different administrators, and different teachers.

In attempting to interject an innovative research plan into the student teaching experience, the three Research Fellows were confronted with somewhat different circumstances. The Utah Fellow had a structured collaborative preservice training effort already in place with the school district. She was able to convene a team of cooperating teachers in the middle of the summer to help in the development of the research plan. Moreover, she had a structured program in which to implement the project. The Mills fellow did not enjoy such a structured relationship. Yet, he had worked with district staff in selecting certain schools as the regular sites for student teacher placement. He was then able to bring the district's staff development director into the collaborative development of his research strategy. At the same time, he had a regular cadre of

experienced cooperating teachers whom he could bring into the implementation of the plan. The Nevada Fellow was faced with a very different situation. He had neither a structured program nor a group of experienced cooperating teachers. The Nevada research strategy with its minimal interaction between college faculty and cooperating teachers reflects this situation.

### Research Fellows

The final set of explanatory factors we will examine are the characteristics of the Research Fellows themselves. A major contention of this section of the study has been that the variance in contextual factors across the three sites accounts for much of the difference among the three research/intervention plans. We are not arguing, however, that differences among the three individuals who spearheaded the research efforts at the three sites did not effect some of the variation in those efforts. As one of the Fellows put it, "We are three different people and you could not expect that we would all go out and do the same things."

The personality of the Research Fellows seems to have had some effect on the research strategy. The Nevada Fellow noted that he "tends to work alone, quietly, on a one-to-one basis." Both the Mills and Utah Fellows describe themselves as outgoing, social types who are more comfortable working with others. The effect of these personality types on the research plans is clear, both the Mills and Utah Fellows involved a number of people, while the Nevada Fellow worked alone.

All three of the Research Fellows enjoyed excellent relations with the administrators in their local school districts responsible

for student teachers. The Mills Research Fellow has authored a number of articles with the staff development officer from Vallejo. The Utah Research Fellow has worked closely with district personnel in the Professional Development Centers. The Nevada Research Fellow, as Director of Student Placement for the university, has been working with the Washoe school district for years and has developed a close working relationship with both the superintendent and the administrator in charge of preservice placement. The relationships of the three Research Fellows with their districts differ, however, regarding cooperating teachers and school site administrators. As we noted in the previous section, the Mills and Utah Research Fellows worked with the same cadre of teachers and administrators and semester after semester, enabling them to develop a network of trusting personal relationships. Because the Nevada Research Fellow worked with different teachers and administrators each semester, he could not maintain similar relationships. The resulting ability of the Mills and Utah Fellows to involve cooperating teachers in their research strategies is the apparent consequence of these differing relationships.

Another important variable appears to be the opportunity for professional growth and advancement that participation in the project afforded the Research Fellows. Both the Utah and Mills Research Fellows are assistant professors, in the process of extending their professional portfolios toward tenure. The Nevada Research Fellow already has tenure, although he viewed the project as an opportunity to be promoted to full professor. It appears as though the Mills and Utah Fellows had more need for research experience and

publications than the Nevada Research Fellow. Their larger stakes were reflected in both the extensiveness of their research/intervention projects and in their attempts to apply the same research strategies in other sites.

It is clear, then, that individual differences in personality, personal relations with relevant actors, and perceived opportunities in the project, all affected how the research/intervention projects differed. It is, however, just as clear that the contextual factors--the characteristics of the local school district, the characteristics of the teacher education program, and the relationship between the two--had a much greater impact on the development and implementation of the research/intervention plans than did the individual differences among the three Research Fellows.

## CHAPTER FOUR

### OUTCOMES FOR TEACHING BEHAVIORS

In this chapter we examine the effects of the various strategies for applying research in teacher education programs on the behavior and attitudes of the participating teachers. We will consider two types of outcomes. First, we are interested in the changes in teachers' use of active teaching behaviors as measured quantitatively by the ATB instrument. Second, we will look at the potential long-term effects of the three interventions by examining changes in student and cooperating teachers' perceptions of their classroom behaviors.

#### Change in Active Teaching Behaviors

In all three research strategies, quantitative data were collected on the participating teachers' use of active teaching behaviors. Observations were made by trained research assistants using the ATB instrument developed at Far West Laboratory. (A copy of the ATB manual is attached as an Appendix to this report.)

In the Mills case, five cooperating teachers and five student teachers were observed at the beginning of the Fall 1983 semester. Subsequently, all 10 teachers went through a three-day training session in the use of active teaching behaviors. All 10 were then observed again later in the semester to gauge the effect of the intervention.

In the Utah case, four cooperating and four student teachers were assigned to treatment group A which took part in the collaborative planning session in mid-July and in the four-day preservice training in September 1983. Another set of four cooperating and four student teachers were placed in group B which only took part in the preservice training. A final set of four cooperating and four student teachers functioned as a control, receiving neither the preservice training nor the opportunity to participate in the collaborative session. In November of 1983, all 12 student teachers were observed to assess their use of active teaching behaviors. The three groups of student teachers were compared in order to measure the relative effect of participation in the collaborative process and the preservice training.

At Nevada, 28 cooperating teachers were observed by the trained research assistant and placed into one of two groups, those high in the use of active teaching behaviors and those low. Each of these two cohorts were broken up into two smaller groups. One of the high-ATB groups and one of the low-ATB groups received an ATB observation instrument to share with their student teachers. The 28 student teachers were randomly assigned to one of the four groups. Pre- and post-intervention data on active teaching behaviors were collected for all student teachers.

The results in all three cases are fairly ambiguous. The data from the Mills intervention are presented in Table 2. Active teaching behaviors for student and cooperating teachers are reported both pre- and post-intervention in four categories, introduction, instruction, closure, and management. In the introduction category,

Table 2

Mills College

Comparison of Frequencies within Categories of Active Teaching Behaviors (ATB)

Student Teachers

		Categories	Introduction	Instruction	Closure	Management
PRE	}	Frequency	9	144	2	26
		% of Behavior within categories	39.1	60.8	50.0	55.3
POST	}	Frequency	14	93	2	21
		% of Behavior within categories	60.9	39.2	50.0	44.7

Cooperating Teachers

		Categories	Introduction	Instruction	Closure	Management
PRE	}	Frequency	22	158	7	36
		% of Behavior within categories	55.0	58.3	63.6	50.0
POST	}	Frequency	18	113	4	36
		% of Behavior within categories	45.0	41.7	36.4	50.0

student teachers increased their use of active teaching behaviors; cooperating teachers reduced theirs. In the instructional category, both student and cooperating teacher active teaching behaviors decreased after the preservice intervention. In the closure category, student teacher behaviors remained stable while cooperating teachers' behaviors decreased. In the management category, student teachers' behaviors decreased, while those of cooperating teachers remained stable. The data do not clearly point to quantitatively measured effects of the research intervention.

Data from the Utah site student teachers are presented in Table 3. In two categories, instruction and management, the control group had the highest frequency of active teaching behaviors; the group which took part in both the collaborative process and the preservice training had (treatment A) the lowest incidence of those behaviors. In the introduction category, the results were the reverse. Treatment group A had the highest level of active teaching behaviors and the control demonstrated the lowest incidence. In the closure category, the data are mixed. Treatment A and the control group have the same incidence; treatment B (those participating only in the preservice training) showed the least active teaching behaviors. Again, the results do not point to any clear conclusions.

The data from the Nevada site (Table 4) suggest some tentative conclusions. In treatment Group IV, which did not receive any introduction to the ATB instrument and in which the student teachers were paired with cooperating teachers low in ATB, there was a decrease of active teaching behaviors in all categories. In Group II, those without the instrument but paired with cooperating

Table 3  
 University of Utah  
 Comparison of Frequencies within Categories of  
 Active Teaching Behaviors (ATB)  
 for Student Teachers

		Categories	Introduction	Instruction	Closure	Management
TREATMENT A	}	Frequency	49	247	17	63
		% of Behavior within categories	46.2	29.7	38.6	27.0
TREATMENT B	}	Frequency	42	271	10	76
		% of Behavior within categories	39.6	32.6	22.7	32.6
CONTROL	}	Frequency	15	314	17	94
		% of Behavior within categories	14.2	37.7	38.6	40.3

Table 4

University of Nevada

Comparison of Frequencies within Categories of Active Teaching Behaviors (ATB) for Student Teachers

GROUP I: HIGH ATB/INSTRUMENT

		Categories	Introduction	Instruction	Closure	Management
PRE	Frequency		8	434	0	82
	% of Behavior within categories		36.4	53.4	0.0	7.9
POST	Frequency		14	378	6	117
	% of Behavior within categories		63.6	46.6	100.0	58.8

GROUP II: HIGH ATB/NON-INSTRUMENT

		Categories	Introduction	Instruction	Closure	Management
PRE	Frequency		7	464	1	97
	% of Behavior within categories		53.8	54.8	100.0	39.1
POST	Frequency		6	383	0	151
	% of Behavior within categories		46.2	45.2	0.0	60.9

GROUP III: LOW ATB/INSTRUMENT

		Categories	Introduction	Instruction	Closure	Management
PRE	Frequency		4	330	1	35
	% of Behavior within categories		20.0	49.4	100.0	31.3
POST	Frequency		16	338	0	77
	% of Behavior within categories		80.0	50.4	0.0	68.8

GROUP IV: LOW ATB/NON-INSTRUMENT

		Categories	Introduction	Instruction	Closure	Management
PRE	Frequency		19	408	5	36
	% of Behavior within categories		79.2	53.3	100.0	52.9
POST	Frequency		5	357	0	32
	% of Behavior within categories		20.8	46.7	0.0	47.1

teachers high in ATB, there was a decrease in all but one of the categories, management. Conversely, the use of active teaching behaviors by student teachers who were introduced to the instrument increased in three of the four categories in both that group paired with high ATB and that paired with low ATB cooperating teachers. We might conclude, then, that the introduction of the instrument appears to be associated with a general increase in active teaching behaviors while non-introduction is associated with a decrease in those behaviors. Such a conclusion is, however, confounded by two factors. First, a purported cause and effect relationship between the introduction of the instrument and the increase in active teaching behaviors is undermined by the fact that in two categories, instruction and closure, one group increased while the other decreased. Secondly, follow-up interviews of the student teachers who had been introduced to the ATB instrument demonstrated greatly varying degrees of introduction. That is, some student teachers were given the instrument to study, were provided with specific definitions of the behaviors, and were aware of being observed, while other student teachers were simply shown the instrument. Thus, it is not possible to claim a specific effect of introduction to the instrument when such introduction took varying forms with the different cooperating teachers.

The results in these three research/intervention plans do not point to clear associations between the specific intervention and changes in active teaching behaviors by cooperating and/or student teachers. This lack of clarity, however, should not be viewed as a function of deficiencies in the three research strategies. These

research projects were, in effect, exploratory studies, first-time attempts to bring local educational agencies and teacher education programs together to apply research findings in the training of student and cooperating teachers.

As is the case with many exploratory studies, the research plans involved a small number of participants, utilized an untested observation instrument, and limited the number of observations. All of these factors contributed to results that are difficult both to analyze and to generalize. At the same time, however, as exploratory studies, these projects set the stage for the Research Fellows and their colleagues in both the teacher education programs and the local school districts to carry out subsequent research projects, profiting from this initial experience. Moreover, participation in the research project had specific effects on the attitudes of student and cooperating teachers toward their classroom activities and the power of research findings to inform these activities. In the following section, we will examine these changing attitudes.

#### Reactions of Student and Cooperating Teachers

A major purpose of the ARTE: RUETE project is to influence teacher attitudes about the value of the use of research in their classrooms. In this section we explore what participating student and cooperating teachers took away from their experience with the research/intervention projects. In all three sites, project staff used a semi-structured format to interview participating teachers after their involvement in the project had ended. Brief excerpts

from the interview data are used in the following discussion.

Interestingly, cooperating teachers in all three sites reacted in a similarly positive manner to their experience. At Utah, the Research Fellow interviewed three of the four cooperating teachers from treatment group A, those who had participated in both the collaborative session and the preservice training. All three of the cooperating teachers noted that their participation had forced them to re-evaluate their own teaching methods. One noted that the research on effective instruction had "reinforced my teaching, strengthened my own beliefs." Another pointed out that while the experience had strengthened her beliefs about effective teaching, it had "also raised some questions about my practices in other areas." One of the teachers actually found her teaching improving as she became more capable of "laying things out for my students." A final positive result was noted by a cooperating teacher who said, "Examining research findings provided me with a more global view of the world of education." Importantly, the one cooperating teacher who was not available for interviewing is pursuing her work with the research on effective teaching by participating in the ongoing teacher education academy.

The cooperating teachers in the Mills project, interviewed by the visiting scholar on that research team, pointed out that the experience had had a definite impact on their teaching methods and the way they think about them. One noted, "It heightened my self-consciousness." The cooperating teachers also found that by the end of the experience they had become much more comfortable being observed. The teachers noted that they also came to view student teachers in a new light, understanding how student teachers

naturally react to their cooperating teachers.

The data from the Nevada Research Fellow's interviews of the cooperating teachers shows similar reactions to participation in that project. One teacher said, "Since I've been teaching for 11 years, sometimes I fall down on some of these things (active teaching behaviors) and it really brought some of those things home to me again." Another pointed out that "as an experienced teacher, I forget some of the basic behaviors which are important, it was a good experience to be reminded."

It is difficult to compare the cooperating teachers' responses across the three sites. The interview protocols were not the same. The Utah Fellow only interviewed those teachers in treatment group A, while at the other two sites all teachers were interviewed. Still, the similarity in responses does point to a common outcome for all cooperating teachers: a re-evaluation of their own teaching methods, a questioning of some of these, and a reinforcing of the appropriateness of others. Moreover, at the Mills site, the teachers seem to have come to understand their relationship with student teachers better.

There appeared to be more variation among the three sites in student teacher response to participation in the project. In Utah, all three of the students agreed that the use of research in developing their personal teaching strategies had given them confidence in their initial teaching assignments. They also noted that they believed it important to base teaching strategies in research findings. One stated, "Now, I have some specific ideas of things that are helpful in teaching, rather than just going by what

'feels' good." Two of the respondents also pointed out that they have continued to discuss the active teaching behavior research with faculty members, and have continued to use it in their subsequent teaching assignments.

Two of the four student teachers at Mills also reported using the active teaching behaviors in their second semester teaching assignments. The student teachers found that their experience had changed their teaching methods, that they now state objectives more clearly, ask open questions more frequently, and pay more attention to what pupils are doing while they teach. These teachers at Mills also noted that they had been fairly skeptical about the potential effectiveness of the research findings when they took part in the three-day training session. It took them time and experience working with the concepts to become convinced of the value of the project.

The student teachers at Nevada expressed some of the same positive responses. One noted, "It was good to see something like this (the ATB instrument) and to remind yourself of what things you need to do." Another said, "It was a very good review for me." Yet, the Nevada student teachers also expressed a certain amount of disappointment in the way they were introduced to active teaching behaviors. One student teacher pointed out that she "wished it hadn't been so secretive." Another, lamenting the cursory nature of the intervention, said, "I wished I had the opportunity to learn about it, maybe my cooperating teacher could have used it with me more."

The variation among the responses of the student teachers at

the three sites, Mills, Utah, and Nevada, can be explained by the relative extensiveness of the three research/intervention plans. At Utah, the student teachers took part in a three-day planning session and a four-day preservice training. At Mills, the student teachers participated in a three-day preservice training. It is not surprising then that the student teachers at Mills noted that they had been skeptical of the value of the research plan after their initial training. The Utah student teachers expressed no such skepticism, as they had been a part of the group which had developed the research plan at that institution. The Nevada student teachers' desire for a clearer and more comprehensive understanding of the research on active teaching behaviors is a function of the limited scope of the Nevada intervention. Here there was no structured training introducing the research, nor was there any structured follow-up. It appears then that with student teachers, the long-term effects of the research strategies depend on the extensiveness of the training and of their participation in its planning.

## CHAPTER FIVE

### OUTCOMES FOR TEACHER EDUCATION PROGRAMS AND THEIR CONTINUED USE OF RESEARCH

A major goal of the Far West Laboratory's collaborative intervention has been to bring about changes in the ways teacher education programs and local educational agencies work together to train preservice and certificated teachers. A main tenet of the research/intervention projects was that the process by which teachers are trained is a function of entrenched organizational characteristics, not of individual personalities. In this chapter, we focus on those changes at the three research/intervention sites that may facilitate the continued application of research findings in the inservice and preservice education of teachers.

The process of training teachers is extremely complex. The preparation of a single teacher involves numerous organizational structures, the institution of higher education, the local cooperating school district, a particular school, and a specific classroom. It is the interaction among these different organizations and the individuals who work within them that constitutes the teacher education process. A discussion of the changes in this complex interactive process helps to define the effect of the Far West intervention on the three sites.

## Nevada

Of the three teacher education programs, Nevada's underwent the most visible structural changes. Prior to the Far West Laboratory intervention, the interaction among the various organizations and personalities was not formally coordinated. The Nevada Fellow functioned in isolation from his faculty colleagues in his placement of student teachers in local schools. For political reasons, different schools and a different group of cooperating teachers were used each year. Moreover, the local school district conducted its own inservice training program without cooperative planning with the university's faculty.

The teacher education process in Nevada is markedly different today. The Nevada Research Fellow and four of his colleagues from the teacher education faculty are presently working with local school district staff to develop a program similar to Utah's Professional Development Centers. Ten student teachers will be paired with 10 cooperating teachers in this single school in the Fall 1984 semester. The program is being arranged with the cooperation of the building principal. The faculty will be responsible for supervising the student teachers and for providing inservice instruction for the school's classroom teachers. Other schools in the local district have expressed interest in developing the Professional Development Centers concept in cooperation with the Nevada teacher education program.

As Far West Laboratory prepares to discontinue its direct work with the University of Nevada, Reno, and the Washoe County Unified School District, the interaction among these organizations and the

individuals within them is now marked by additional cooperative efforts toward the improvement of the teacher education process. Five university faculty are working together in one setting. A cadre of cooperating teachers has been invited to collaborate with the teacher education program to ensure that student teachers are repeatedly placed with experienced professionals. A sufficiently large group of student teachers are being placed in one school to allow them to work together, videotaping one another's classes and providing one another support. Moreover, the school district and the teacher education faculty are cooperatively planning inservice training of district teachers. In many ways, then, the teacher education process in the Nevada site is structured in such a way as to facilitate the introduction of research findings. Faculty, student teachers, cooperating teachers, district personnel, and school-level principals are working together to improve the process of training teachers.

#### Mills

At Mills, the small faculty was already cooperating in their programmatic efforts, the teacher education program had established a cadre of experienced cooperating teachers in specific schools, and the faculty worked closely with the staff development officer in the local school district. On the basis of this close interaction among the various organizations and individuals central to the teacher education process, the Research Fellow and his colleagues have been able to initiate a number of projects building on their experiences with the research/intervention project.

Right after the conclusion of the research project on active teaching behaviors and academic learning time in the Fall of 1983, the faculty at Mills decided to implement a second phase in the spring semester. Given their experience with the first phase of the project, the same cooperating teachers were invited to join in the collaborative planning of the second research/intervention plan. Again, the focus of the project was to improve the use of active teaching behaviors and academic learning time.

At the same time, the Mills Research Fellow and a visiting scholar at Mills adapted the research/intervention strategy, which had been used in the teaching of elementary math classes, to science classes. The results of this research project have been reported elsewhere (Russell, 1984).

These two additional research projects demonstrate that the application of research to the teacher education program is beginning to be institutionalized at Mills. The faculty has taken the systematic methodology which it learned through participation in the Far West Laboratory project and has begun to apply it to a number of relevant situations. The Mills Research Fellow intends to repeat the research/intervention project with the Fall 1984 student teaching group.

Mills has also begun to extend its efforts to work in cooperation with a number of other institutions of higher education in the northern California area as a part of its teacher education academy plans. Unlike the University of Utah and the University of Nevada, Mills is surrounded by numerous universities and colleges with teacher education programs. Many of these institutions place

student teachers and/or graduates in the same school districts. An improvement of the overall process of training teachers in the area, then, requires a certain amount of cooperation among the many teacher education programs. Mills has spearheaded an effort to bring approximately 15 separate institutions together to discuss ways of effectively cooperating with one another as well as with local school districts. This joint venture is being funded by a private foundation.

The process changes at Mills, then, are quite different than those in Nevada. Mills had already established many of the structures which are now being put in place in Nevada. The existence of the structures, a strong cooperative relationship among and between faculty and the local school district, allowed the Mills faculty to move quickly to implement a number of other research projects based on its experience with the Far West Laboratory program. At the same time, Mills location in populous northern California provided the teacher education faculty with the opportunity to work with faculty from a number of other institutions. While these changes do not represent a fundamental shift in the process by which teachers are educated at Mills, they do point to an increase in the systematic application of research to the program. Moreover, Mills cooperation with 15 or so other teacher education programs may lead to significant changes in the way local communities and universities interact to meet the labor market demands of elementary and secondary schools in northern California.

## Utah

Prior to the Far West intervention, the teacher education process in Utah enjoyed the most structured cooperation among the teacher education program, the local school districts, and the cooperating schools. Utah had Professional Development Centers (PDCs) established in schools throughout its cooperating school districts. All student teachers were placed in one of these centers for their student teacher experience. The same cadre of cooperating teachers and the same school administrators worked with each cohort of new student teachers. Moreover, university faculty assisted in the inservice training of teachers in the PDCs. In short, the complex interactive process which defines how student teachers are trained was structured to a greater extent in Utah than in either of our other two sites. This structure was marked by a high degree of cooperation among the teacher education program, the school districts, and the schools which served as sites for the PDCs.

Given this structure, the Utah faculty has taken the research strategy which they used in one professional development center and extended it to not only all of the PDCs but to school districts statewide as part of the teacher education academy plans. They have used the established structures to expand their efforts to systematically apply the research on effective teaching in their teacher education program. For example, Utah is including a rural district in the southeastern region of the state with which the institution has not worked before in its research plan for September, 1984.

Utah's cooperation in the Far West project, however, has led to different changes in the teacher education process than occurred in Nevada and Mills. In both Nevada and Mills, the changes were toward recognition of the complexity of the interactive teacher education process. Nevada has brought school district personnel, school-level administrators, cooperating teachers, and teacher education faculty into a structured process. Mills has begun to cooperate with a number of other institutions of higher education to coordinate their teacher education efforts. Such efforts have not been necessary at Utah. The University of Utah, Salt Lake City, is the largest and one of only a small number of teacher education programs in northern Utah. Moreover its program already has structured its interaction with local cooperating school districts. Thus the changes in the Utah program have been quantitative ones as it works to expand its efforts to more and more districts and schools.

## CHAPTER SIX

### CONCLUSION

This report offers a cross-site analysis of three research/intervention projects (R/IPs) that were carried out as part of a larger study of applying research in teacher education. The report describes the development and implementation of the three projects at sites in Utah, California, and Nevada and examines outcomes of the projects with regard to changing teaching behaviors and continuing use of research in teacher education.

#### Development and Implementation of the Projects

The overall intervention strategy for the three intervention projects was conceived, developed, and implemented by Far West Laboratory for Educational Research and Development. The primary result of the intervention strategy was that faculty in three teacher training programs began to apply systematically in their preservice programs the existing research on effective teaching strategies.

The specific nature of the development and implementation of a strategy for each site, however, was tied to the Far West Laboratory's collaborative intervention approach. In this case, Far West Laboratory worked with three teacher education faculty members (the Research Fellows) from three institutions of higher education and their respective cooperating school districts. This was an

attempt to bring the research on effective instruction to bear on each organization. The three different research/intervention projects, therefore, were functions of the differing characteristics of the various sites.

In Nevada, the research/intervention plan was developed partly in response to the plans for the other two sites. Both the Utah and Mills Research Fellows developed elaborate plans for introducing student teachers to the relevant research which included the participation of other teaching faculty, student teachers, and cooperating teachers. Exposed to these planning models, the Nevada Research Fellow decided to use a much less elaborate method of introducing the research. His purpose was to examine the relative efficacy of expending significant efforts on applying research to teacher education programs.

At Mills College in California, where the faculty was accustomed to using the research from the child development literature in its teacher training program, the Research Fellow noted that the intensity of the collaborative process led to a much more systematic application of the research in his particular R/IP than he or his colleagues had experienced previously.

At the Utah site, the Research Fellow pointed out that the extensive collaborative nature of her research/intervention plan, wherein the project was developed and implemented by a team of teacher education faculty, cooperating teachers, and student teachers, was a direct result of the collaborative process she had experienced.

In Figure 3 of Chapter Three we indicated the interaction

among the characteristics of the three sites that affected the development and implementation of the research/ intervention projects. Specific aspects of the structure of the teacher education program, its size, the traditional collaboration among faculty members, and the existence of latitude in the program for the interjection of an innovative project, combined to affect the research strategy. Similarly, the commitment of the local educational agency to the ongoing training of teachers affected the various research plans. Yet, in all three sites, the traditional relationship between the teacher education program and the cooperating school district played the most important role in affecting the varying outcomes. This relationship was, naturally, itself a function of the characteristics of the teacher education program and the cooperating school districts. Finally, the three Research Fellows themselves played a pivotal role in defining the different plans. Our analysis of the variation among the three research strategies leads us to conclude, however, that individual differences were of secondary importance in relation to the structural characteristics.

#### Outcomes

While the short term goal of the collaborative process of research intervention was the application of research where it had not been used extensively before, the long term goal was the development of professionals who would continue to utilize research skills and findings in their work beyond the specific project at hand. The overall intervention strategy called for this second

goal to be achieved through the formation of Teacher Education Academies that would continue even after Far West Laboratory was no longer directly involved in the projects. Through interviews with the Research Fellows and examination of their activities outside of the Far West Laboratory project, we have found ample evidence that this secondary goal is being realized.

Prior to his participation in this project, the Research Fellow in Nevada felt that he was isolated from his peers. In fact, there was little structured support for collegial interaction and support among faculty members in his department. As a result of his intensive efforts to apply research in the teacher education program and the visible support he received in doing so from both Far West Laboratory and the Research Fellows, he reported, "I am no longer an island in my institution. Now there is dialogue among the faculty members." The Nevada Research Fellow has begun to use some of the techniques from the effective teaching literature in his own teaching. Moreover, he is planning further research projects with a number of the other faculty members who are interested in applying the research on teacher effectiveness in their courses. As a result of his participation in this project, the Nevada Research Fellow expanded his leadership role in his department. He is now spearheading an attempt to establish a Teacher Education Academy at a local elementary school in which four or five teacher education faculty members, 10 student teachers, and various school personnel will work in a formalized, collaborative endeavor.

At Mills, the results of the Far West Laboratory intervention are perhaps even more tangible. Here the Research Fellow found himself in an environment where there was already a great deal of

mutual support and interaction among faculty members. Working from this supportive base, the Research Fellow, in collaboration with a department colleague and a visiting scholar, developed two research/intervention plans in addition to the one he had established in his work with the Far West Laboratory Regional Teacher Education Team. In one study, three faculty members examined the transferability of the research on academic learning time and active teaching behaviors which the Research Fellow had used in his Far West Laboratory R/IP to the teaching of high school science. In the second study, the Research Fellow and his colleagues at Mills plan to use the same research strategy he had developed as part of his work at Far West Laboratory in a second school district that was not part of the Far West Laboratory study. Again, we see the effects of the intensive collaborative mode of intervention used by Far West Laboratory on the professional activities of a researcher beyond the limits of the intervention itself. Of considerable interest is the Mills effort that brought approximately 15 separate teacher education programs and their cooperating school districts together to explore collaborative and innovative research applications. This effort has been supported by private foundation funding.

At the Utah site, too, the Research Fellow has begun to incorporate active teaching behaviors into her own teaching. Furthermore, the Research Fellow intends to incorporate the research on active teaching behaviors into the "early experience" portion of the school's preservice training, an optional yet formally structured orientation period of two weeks in the fall of each year. She will also train the cooperating teachers who super-

vise student teachers on how to observe active teaching behaviors. In short, she is incorporating the research findings from her study with Far West Laboratory into the institution's regular teacher training and inservice training. In addition, she is discussing the possibility of using the collaborative model with a number of fellow faculty to examine the research on teacher educators' supervision of student teachers in order to strengthen their activities in this area. Finally, the research strategy is being extended not only to all of the PDCs but also to school districts throughout the state. This is most promising for the continued use and application of recent research findings.

#### Summary

There were no clear results regarding change in classroom teaching behavior. However, the perspectives of student and cooperating teachers toward the value of research became increasingly positive across all three sites. Achievement of the project goal of a continuing and expanding network among teacher education programs and local education agencies seems promising at this time.

Our analysis of the three research/intervention projects reaffirmed the belief that the process by which teachers are educated is a complex, interactive one involving numerous organizations and individuals. Teacher education programs, their faculty, school districts and their staff development officers, schools and their principals, classrooms and their teachers all interact to define the education of a single student teacher. Change in such a complex interactive process can never be linear; that is, an outside

agency cannot simply cause specific changes to occur. Rather change is a joint product of outside factors and specific situational characteristics. Attempts to effect change in the preparation of teachers must begin with an understanding of the influence of contextual factors. The variation among the three research/intervention projects is evidence of the validity of this contention.

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APPENDIX:

ARTE: RUETE ACTIVE TEACHING BEHAVIORS MANUAL



**FAR WEST LABORATORY**  
FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

APPLYING RESEARCH IN TEACHER EDUCATION PROGRAM:  
RESEARCH UTILIZATION IN ELEMENTARY TEACHER EDUCATION

ACTIVE TEACHING BEHAVIORS MANUAL

Elsie W. Gee

1983

ARTE: RUETE  
Active Teaching Behaviors (ATB)

The observation system described here is designed to reflect behavioral evidence of active teaching behaviors during direct instruction in the classroom. It provides a common language for discussion and serves as an indicator of the presence of some characteristics of effective instruction.

The active teaching constructs structure the collection of as much instructional information as possible. The observer focuses on the teacher and what s/he is doing. Observers will record information about instruction for the duration of one complete lesson period including sequence, frequency, and field note descriptions. This calls for continuous monitoring of the teacher during instruction in a basic skills lesson. The observation form presents a minute by minute account of how instruction is conducted. Behaviors should be recorded specifically and in as much detail as possible.

The following sections identify the categories and variables of instructional behaviors you will be observing and describing, discuss the observation sheet on which you will record information, and presents the procedures for accurate and complete reporting.

ATB Observation Categories and Variables

The categories and variables reflect recent research on effective instruction and focus upon the elements of instruction. Therefore, observers focus on teacher behavior related to delivering instruction. Potentially there are many things about instruction in which one could be interested, however, for purposes of reflecting the active teaching constructs observers focus only on the teacher's behavior and how students respond to this. Essentially, we are interested in four categories:

1. How the teacher introduces instruction.
2. How the teacher carries out instruction.
3. How the teacher maintains student engagement.
4. How the teacher concludes instruction.

These four categories are thought of as the core of instruction and represent events which occur in the stream of instruction as a teacher presents lessons to students. Generally, the four elements occur in a cycle: a teacher introduces the lesson, presents new information, establishes and maintains students in the activity, and summarizes the instruction presented. During instruction a teacher cycles back through these four categories and switches among them.

The task of the observer is to describe precisely and objectively how the teacher does these things. Naturally, each teacher does any of these things in different ways. In fact, teachers use many different strategies to accomplish any one of these things. It is not possible to list the many ways in which each of these four categories of instruction might be expected to look during observations. However, based on previous research we can speculate about the various ways in which each of these four categories might be manifested. These are provided in the discussion which follows.

### Introduction

1. Stated goals/objectives: Teacher opens with a statement of the purpose of the lesson; what the student is to learn. The intent is to focus the lesson, alert the student to intended objectives, and to what s/he is to produce. Example: "Today we will study prefixes, which will help you to read hard words better and faster."
2. Outlined lesson: Teacher informs student of how the lesson will proceed, activities to follow, tasks to be completed, and sets time limits. Example: "First I will tell you about wolves, then you will write a story about them. We will finish by 11 o'clock."
3. Explained concepts/definitions: Teacher introduces the definitions in advance, or in context; may provide hand-outs, use visuals, etc.; teacher states the concept in a clear statement in order to highlight for student awareness. Example: "Deciduous trees, like maple and apple trees, lose their leaves in the winter."
4. Reviewed goals/previous instruction: Teacher connects today's lesson with previous lesson by tying the two together with a statement such as, "Yesterday we went on a field trip to a farm and today we will study animals that live on a farm."

### Instruction

5. Gave directions: Teacher provides directions for activities. Example: "First you will underline each vowel in the word, and then you will write a sentence using the whole word."
6. Didactic/lecture: Teacher makes direct, straightforward presentation of material through lecture, film, etc. Basically this is a one-way communication.

7. Illustrated, modeled, demonstrated: Teacher gives a verbal illustration of an instance that exemplifies the concept of focus, provides a graphic arts illustration, uses the chalkboard to illustrate a point, visually demonstrates using media or provides behavioral enactment of the desired action.
8. Questioned: Open/concepts/understanding: Teacher asks questions which are open-ended, relate to concepts being presented, and/or checks for student understanding of content. Example: "What would happen if we didn't capitalize some words?"
9. Questioned: Closed/facts: Teacher asks closed questions of a factual nature; recall questions; moves lesson along with a quick check. Example: "Now who can name the three causes of the Civil War?"
10. Answered: Content/questions: Teacher responds to student questions related to the content being taught. Example: "Yes, dinosaur fossils could be found under the ocean."
11. Answered: Procedural questions: Teacher responds to student questions about procedures, how to perform assigned tasks, etc. Example: "No, first you should write the word and then cover your paper and spell it."
12. Provided feedback: Teacher communicates to students if answer/work/procedures are correct or incorrect. Example: "That's right. You remembered to indent all your margins."

### Closure

13. Summarized lesson/work: Teacher restates/provides overview of material presented together with procedures and tasks accomplished. Example: "Today we learned three things about tadpoles and wrote a poem about them."
14. Collected work: Teacher requests students to turn in their work. Example: "Please pass your paper to the person on your left."

### Maintenance

15. Restated class rules: Teacher reminds students of appropriate behaviors/procedures by restating class rules. Example: "Remember, we always use 'walking feet' in our classroom."
16. Told to attend: Teacher reminds students to listen, to participate, to be "on task", or to attend to current instructional activity. Example: "Mike, your eyes need to be on your own paper."

17. Roamed room: Teacher walks among students. Purpose may be to check work, management, etc.
18. Signalled (non-verbal): Teacher gestures, stares, or otherwise indicates modification in student behavior. Example: Teacher puts finger to her lips for quiet.
19. Scanned room: Teacher looks around the classroom to monitor engagement and/or "on task" behavior.
20. Disciplined: Teacher intervenes regarding disruptive behavior on the part of a student. Example: Sending the student from room.

### ATB Observation Procedures

The observation task is two fold: (1) categorizing the frequency of observed variables, and (2) describing instructional behaviors of the teacher. Both are completed on a minute by minute basis. These two tasks are described in this section.

Recording the frequency of instructional behaviors involves selecting one of 20 variables which best characterizes the teacher's behavior that occurred during the minute being coded. These 20 variables are designed to be sufficiently flexible so that instructional behaviors can be assigned to one of the variables.

Once the variable has been selected and checked, the observer must write a description of the specific action or language which exemplifies the variable.

Steps for completing the observation recording sheet are:

1. Circle the appropriate site number as designated by your trainer.
2. Enter the name of the teacher for "CLASS."
3. Enter the sheet number for the lesson you are observing. Each complete lesson will begin a different series of sequential numbers.
4. Enter the date [month/day/year] of the observation day. For October 14, 1983 enter "10/14/83."
5. The actual recording of variables is in two parts:
  - a. Beginning with the first minute of the lesson, and continuing minute-by-minute through the entire lesson, place a checkmark in one appropriate variable column for the teacher behavior observed. For example, if during the fifth minute of the lesson you see the

teacher leave her desk and walk among the students' desks, then you would place a checkmark in row 5, column 17: Roamed room.

Enter only one checkmark for each minute of observation. If you observe more than one variable in any given minute, place a check in the one variable column you feel reflects the behavior emphasized by the teacher.

- b. Immediately after you have placed a checkmark in one variable column which corresponds to the appropriate minute row, write a phrase describing the behavior of the teacher during that minute in the "Description" column. These descriptions will be brief. For the example above, if you observed the teacher roaming the room and s/he stopped at the desk of a child who was talking loudly to another student several seats away about the pencils and erasers in his pocket, you might write "Roaming, stopped at desk, child calling out, put hand on child's shoulder, child attended to worksheet."

If information is made available later in the lesson which sheds light on the context and purpose of the lesson, codes can be changed.

6. After the entire lesson is finished, you must record two more observations. These last two recordings are based on your sense of the lesson as a whole.
  - a. At the top of your first sheet (sheet # 1) in the information box, which appears on the left half of the sheet, and below the dotted line, place one checkmark. Below "MOMENTUM" a check is placed beside "YES" if you felt the teacher was able to sustain students' interest, moved the lesson forward at an appropriate pace, and accomplished stated lesson objectives. Place a checkmark by "NO" if you do not think momentum was sustained.
  - b. One checkmark is placed by "YES" for "DIFFERENTIATED INSTRUCTION" if you feel the teacher paced, restructured, or re-taught the lesson to meet student needs. Place a checkmark by "NO" if you feel the teacher did not show this flexibility.
7. Sum the checkmarks in each column for each sheet. Enter the sum for each column, 1 through 20, in the row "TOTAL". If no checkmark appears, enter a zero (0) in the column. The total of sums, column 1 through 20, for each sheet should be no more than 7.

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ARTE: RUFTE  
ACTIVE TEACHING BEHAVIOR  
OBSERVATION RECORD

SITE: 1 2 3 4 5 6 7 8 9 CLASS #: _____ SHEET #: _____ OBSERVER CODE #: _____ DATE: _____ ..... Momentum: Yes _____ No _____ Differentiated Instruction: Yes _____ No _____		INTRODUCTION	INSTRUCTION	CLOSURE	MAINTENANCE
Hr.	MI.	Description	1 Stated Goals/Objectives	1 Questioned: Open/Concepts/Understanding	1 Restated Class Rules
			2 Outlined Lesson	2 Answered: Content/Questions	2 Told to Attend
			3 Explained Concepts/Definitions	3 Provided feedback	3 Rounded Room
			4 Reviewed Goals/previous instruction	4 Summarized lesson/work	4 Signalled (non-verbal)
			5 Gave Directions	5 Collected work	5 Scanned Room
			6 Didactic/Lectured	6 Restated Class Rules	6 Disciplined/Reinforced
			7 Illustrated: Modeled, Demonstrated	7	
			8 Questioned: Open/Concepts/Understanding	8	
			9 Answered: Closed/Facts	9	
			10 Answered: Content/Questions	10	
			11 Provided feedback	11	
			12 Summarized lesson/work	12	
			13 Collected work	13	
			14 Restated Class Rules	14	
			15 Told to Attend	15	
			16 Rounded Room	16	
			17 Signalled (non-verbal)	17	
			18 Scanned Room	18	
			19 Disciplined/Reinforced	19	
			20	20	
9/19/83			TOTAL		

98