DOCUMENT RESUME

ED 292 251 EC 202 033

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TITLE	Microcomputer-Based Assessment of Preservice Special Education Teachers. Project STEEL. A Special Project To Develop and Implement a Computer-Based Special Teacher Education and Evaluation Laboratory. Volume I. Final Report.
INSTITUTION	Indiana Univ., Bloomington. Center for Innovation in Teaching the Handicapped.
SPONS AGENCY	Office of Special Education and Rehabilitative Services (ED), Washington, DC.
PUB DATE	30 Dec 86
GRANT	G008301778
NOTE	183p.; For related documents, see EC 202 032-036.
PUB TYPE	Reports - Descriptive (141) -- Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	*Classroom Observation Techniques; Computer Assisted Testing; *Disabilities; Educational Practices; Higher Education; *Instructional Effectiveness; Microcomputers; *Preservice Teacher Education; *Special Education Teachers; *Teacher Effectiveness
IDENTIFIERS	*Project STEEL

ABSTRACT

The document is part of the final report on Project STEEL (Special Teacher Education and Evaluation Laboratory) intended to extend the utilization of technology in the training of preservice special education teachers. This volume focuses on the first of four project objectives, the development and implementation of a microcomputer-based assessment system for preservice special education teachers. Activities of Year 1 included data gathering on teacher behaviors, software development, observer training and field testing, and trainee feedback. Year 2 activities involved revision of the microcomputer-based observation system (MBOS), Project STEEL observation system field tests, application to the undergraduate program, use by graduate supervisors, and students' reactions to the system. Year 3 activities included evaluation of the preservice teacher group data, and an effectiveness study. This study is presented in its entirety. Preservice special education students (N=27) in the multiple baseline study received information on the concept of Academic Learning Time (ALT) and the relationship between this information and MBOS. Feedback was provided in the form of either traditional field notes or computer-based feedback. Results demonstrated that the computer-based feedback significantly increased rates of effective teaching behavior compared to field note feedback. (DB)

FINAL REPORT

Department of Education Grant No. G008301778

Project No. 029KH30094

VOLUME I

A SPECIAL PROJECT TO DEVELOP AND IMPLEMENT A COMPUTER-BASED SPECIAL TEACHER EDUCATION AND EVALUATION LABORATORY:

Microcomputer-based Assessment of Preservice Special Education Teachers

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Project STEEL Final Report

OVERVIEW

This report describes developed products, research, and evaluation regarding the computer-based Special Teacher Education and Evaluation Laboratory (STEEL) at the Center for Innovation in Teaching the Handicapped (CITH), School of Education, Indiana University, Bloomington. Four major goals were achieved in Project STEEL:

I. Development, implementation, and evaluation of a microcomputer-based observation system for codification, storage, and summarization of special education trainees' classroom teaching performances (STEEL/MBOS);

II. Development, field testing, and evaluation of computer literacy training procedures and materials for preservice and inservice special education teachers (STEEL/COLT);

III. Development, implementation, and evaluation of a computer-based testing system for assessing teacher knowledge (STEEL/CBTS); and

IV. Development and preliminary evaluation of a computer-based information management system for storing and retrieving data on special education teachers' performances during their preservice training program (STEEL/IMS).

Comprehensive descriptions of each of these major accomplishments are provided in four separately bound reports (Volumes I through IV, respectively). A fifth separately bound report contains the executive summary of Volumes I through IV, and should be read first.

This document contains Volume I only.

Development and Evaluation of the STEEL/MBOS

Year 1 Activities

During the first year of the Project, priority was devoted to the development and field testing of the STEEL Observation System. Observation systems utilized in the Beginning Teacher Evaluation Studies (Fisher et al., 1978) and the Academic Learning Time research conducted at CITH (Rieth & Frick, 1982) were reviewed. A series of consecutive meetings were held by the STEEL staff, and a prototype observation system was developed. Several revisions of this system were undertaken prior to its being field tested. These revisions were conducted in a series of meetings with the CITH staff, graduate student supervisors who were to use the system in the field, and key special education faculty members. When consensus had been reached regarding the formative version of the instrument, five supervisors were trained to use the system with the Epson HX-20 portable microcomputer and field tested it in the classrooms.

In the initial year of the project, field supervisors gathered data on the teaching behavior of fifty-four undergraduate teacher trainees over a period of eight weeks. This period served as the pilot phase in developing the observation system. Following field testing, graduate supervisors were thoroughly debriefed. They shared their perceptions of the system and consumer satisfaction information. Based on this varied feedback, the observation instrument was revised again over the following summer. The formative version of this system involved a 59-code teacher and student behavior observation procedure and a 95-item checklist of qualitative indicators to be used in evaluating student trainees' classroom performances (see Attachment A).

Volume I, Attachment A

STEEL OBSERVATION SYSTEM

IDENTIFICATION INFORMATION

DATE: ____________________ __/__/__

OBSERVER: ____________________ ID # __

TEACHER OBSERVED: ____________________ ID # ___

CATEGORIES FOR CODING OF CLASSROOM, TEACHER, AND STUDENT VARIABLES

1. Classification: Group Structure (in relation to the observed teacher's focus)
   Categories:
   - 10 Null
   - 11 Whole group responsibility
   - 12 Partial group responsibility
   - 13 Partial group responsibility with additional monitoring
   - 14 Individual responsibility
   - 15 Individual responsibility with additional monitoring
   - 19 Can't tell

2. Classification: Educational Activity
   Categories:
   - 20 Null
   - 21 Active Instruction
   - 22 Passive Instruction
   - 23 Transition/Procedural
   - 29 Can't tell

3. Classification: Teacher Instructional Behaviors
   Categories:
   - 30 Null
   - 31 Preparation/Administrative Duties
   - 32 Observational Monitoring
   - 33 Structuring/Directing
   - 34 Explanation/Questioning - Planned
   - 35 Explanation/Questioning Need
   - 36 Evaluative Feedback
   - 37 Task Engagement Feedback
   - 38 Behavioral Feedback
   - 39 Can't tell

4. Classification: Student(s) Behaviors (Target group)
   Categories:
   - 40 Null
   - 41 Engaged - Active
   - 42 Engaged - Passive
   - 43 Non-Engaged - Active
   - 44 Non-Engaged - Passive
   - 49 Can't tell

5. Classification: Student(s) Behaviors (Monitored group)
   Categories:
   - 50 Null
   - 51 Engaged - Active
   - 52 Engaged - Passive
   - 53 Non-Engaged - Active
   - 54 Non-Engaged - Passive
   - 59 Can't tell

STEEL OBSERVATION SYSTEM
OPERATIONAL GUIDELINES

GROUP STRUCTURE: This classification describes the focus of the observed teacher's attention in relation to student group arrangement. Differences in group structure call for different instructional and group management techniques. Conversely, differences in instructional intent may call for different arrangements. Thus, evaluation of one's teaching techniques necessitates identification of the group structure.

10 NULL	No apparent structure; the teacher doesn't have a group of student; classification is not relevant in this situation. Examples: teacher not in room; teacher is observing the cooperating teacher/class; teacher not responsible for any student.
11 WHOLE GROUP RESPONSIBILITY	The teacher is directing a task in which all students from the class are simultaneously involved. Examples: lecture; demonstration; class discussion; whole group is involved in seatwork with teacher monitoring.
12 PARTIAL GROUP RESPONSIBILITY	The teacher is working with one group (subset of whole class) and has no responsibility for other students in the room. Example: teacher is working with one small group on an assignment while rest of group is watching a demonstration presented by another teacher.
13 PARTIAL GROUP RESPONSIBILITY WITH ADDITIONAL MONITORING	The teacher's primary responsibility is instruction of one group (subset of whole group) , but he/she is also monitoring the task behavior of other students in the classroom. Example: teacher is helping one group with their joint science project while monitoring other groups who are discussing their own projects.
14 INDIVIDUAL RESPONSIBILITY	The teacher is working with an individual student and has no responsibility for the other students in the classroom. Example: teacher is tutoring a student while rest of group is participating in a group discussion led by another individual.
15 INDIVIDUAL RESPONSIBILITY WITH ADDITIONAL MONITORING	The teacher is working with an individual student but is also responsible for monitoring the task behavior of other students in the classroom. Example: teacher is answering a student's question while monitoring other students doing individual seatwork.

19 CAN'T TELL

Class is in session, but the group structure is not immediately determinable.
Examples: activity has just begun and the group structure has not been determined yet; observer enters during a session already in progress and the nature of the teachers responsibilities is not immediately clear.

EDUCATIONAL ACTIVITY: Research has shown that increased classroom time allocated to academic tasks is positively correlated with gains in student achievement. Further, active (or direct) instruction by the teacher is more effective than passive (or indirect) instruction. Thus, it should be the goal of the teacher to minimize time spent on non-academic activities and to increase the amount of active instruction spent in the classroom.

20 NULL	This classification is not appropriate in this situation, the teacher doesn't have responsibility for working with student(s) at this time (e.g. group structure is null). Examples: class is not in session; teacher is observing cooperating teacher/class.
21 ACTIVE INSTRUCTION	The teacher is engaged in direct, interactive instruction of the student(s) on a curriculum-related topic. Examples: lecturing; demonstrating, questioning; answering students' questions.
22 PASSIVE INSTRUCTION	The students are engaged in an instructional task but the teacher is not actively or directly involved in instruction and is not in a position to directly evaluate student performance. Examples: teacher is monitoring individual seatwork and only interacting with a student when he/she asks a question; teacher sits at her desk and occasionally looks around the room while students take a test.
23 TRANSITION/ PROCEDURAL	During transitions, the teacher and students are moving from one activity to another. This usually involves putting away materials for previous task and preparing for the next.. Procedural activities involve recordkeeping and routine classroom tasks. Examples: passing English papers to the front and getting out Science folders; waiting for teacher to pass out papers; setting up equipment for next activity; free time; recess; taking attendance.
29 CAN'T TELL	Class is in session, but the educational activity is not immediately determinable. Examples: the observer lacks sufficient proximity to the activity; the nature of the teacher/student interaction is unclear.

TEACHER INSTRUCTIONAL BEHAVIORS: This classification focuses on those behaviors of the observed teacher that are directly related to the delivery of the instructional content.

30 NULL	The teacher is not engaged because he/she has no responsibility in the classroom. Examples: cooperating teacher is in charge of all pupils
31 PREPARATION/ ADMINISTRATIVE DUTIES	Teacher is engaged in an activity necessary to the delivery of instruction, or is involved in a routine or administrative classroom task. Teacher is not interacting with student(s) in a curriculum-related task. Examples: resource teacher reads student's math assignment from the regular class prior to assisting him/her in completing the assignment; teacher writes a series of examples on the board prior to leading a class discussion on the examples; taking attendance; collecting lunch money; reading/listening to announcements.
32 OBSERVATIONAL MONITORING	The teacher is directly observing how well the student(s) is/are doing on an curriculum-related task but is not overtly interacting with the student(s). Examples: looks over student's shoulder as s/he works; watches students work problems on board; listens to oral book report.
33 STRUCTURING/ DIRECTING	Teacher structures or gives directions for a curriculum-related task, or teacher gives rationale for doing the task, or teacher relates present activity to prior one. Does not involve the substance of the task itself. Examples: "Do the first 5 problems on page 22 in your math book."; "The reason we're doing this activity is so you will know if you receive the correct change when you pay for something at the store;" "Remember, yesterday we learned how to use the scale at the bottom of the map to find distances between cities. Today we'll try out what you learned on a map of Indiana..."
34 EXPLANATION/ QUESTIONING - PLANNED	Teacher provides a statement or asks a question concerning the substance of a curriculum-related task. The statement or question is not about directions to or structure of the task. Examples: lecturing; modeling; demonstrating; reviewing; "What is the capital of Indiana?"; "Summarize the main points of the story."; teacher shows flash card and waits for a response."

STUDENT(S) BEHAVIORS (Target group): This classification is used to describe the task-related behavior of those students (whether an individual, partial group, or whole group) who are the target instructional focus of the observed teacher. If the teacher is also responsible for monitoring other students (Group Structure categories 13 and 15), the next classification, Student(s) Behaviors (Monitored group), is used to describe the task-related behavior of the monitored students.

40 NULL	This classification is not relevant at this time as the student(s) are not expected to be engaged in an instructional activity. Examples: Class is not in session; free time; teacher is engaged in academic preparation while students wait.
41 ENGAGED - ACTIVE	The student(s) are overtly attending to or involved in a classroom task in an observable manner. Examples: writing; manipulating objects; using calculator; typing on computer; asking or answering question; drawing; commenting; presenting oral report; reading aloud.
42 ENGAGED - PASSIVE	The student(s) are covertly attending to or involved in a classroom task. Examples: silent reading; listening; watching; thinking.
43 NON-ENGAGED - ACTIVE	The student(s) are not attending to a classroom task and are actively interfering with that task (either for themselves or others). Examples: making irrelevant comments; out of seat; physically disturbing other students;
44 NON-ENGAGED - PASSIVE	The student(s) are covertly not attending to a classroom task. Examples: daydreaming; looking out window; sleeping; remaining silent or immobile during oral or written assignments.
49 CAN'T TELL	An instructional activity is in progress but the nature of the student's behavior is not immediately determinable Example: observer lacks sufficient proximity to determine student behavior; nature of expected student response is not clear.

35 EXPLANATION/ QUESTIONING NEED

Teacher provides a statement concerning the substance, or procedures of a curriculum-related task because one or more students have asked for assistance or guidance. NOTE: Explanation/questioning - planned tends to occur during active instruction; whereas explanation/questioning - need tends to occur during passive instruction.
Examples: Teacher helps Jane because she has raised her hand during seatwork. Juan comes up to the teacher's desk and asks for help with his homework. Tony asks the teacher to clarify how he is do complete his seatwork assignment.

36 EVALUATIVE FEEDBACK

Teacher informs the student(s) whether her/his performance in a curriculum-related task is correct or incorrect but provides no additional feedback.
Examples: oral remarks such as "That's right.", "No."; written marks on a test or worksheet; physical gestures such as "Thumbs up," a nod, or shake of the head.

37 TASK ENGAGEMENT: FEEDBACK

Teacher comments on level or degree of student engagement or nonengagement, but not about the substance or directions of a curriculum-related task.
Examples: "I'm glad to see you're working so hard."; "Pay attention."; "Quiet, get back to work ..."

38 BEHAVIORAL FEEDBACK

Teacher comments on student behavior not related to specific task-engagement or non-engagement. Includes both positive and negative feedback.
Examples: "Bryan, I like the way you always come to class prepared with your supplies."; "Please put your gum away. You know it's not allowed in this class."; teacher lectures student(s) on why tripping a student in the aisle is dangerous.

39 CAN'T TELL

Teacher is engaged in an instructional activity, the nature of which is not immediately determinable.
Examples: The instructional activity has not gone on long enough to make clear its nature; the observer lacks sufficient proximity to the activity to determine the teacher's behavior.

STUDENT(S) BEHAVIORS (Monitored group): This classification is relevant only in conjunct n with Group Structure categories 13 and 15, and is used to describe the behavior of the majority of students who are being monitored while the teacher's primary attention is f used on other students. When the teacher has no additional monitoring responsibil the category in this classification will always be NULL.

50 NULL	This classification is not relevant at this time as the student(s) are not expected to be engaged in an instructional activity. Examples: Class is not in session; free time; teacher is engaged in academic preparation while students wait.
51 ENGAGED - ACTIVE	The student(s) are overtly attending to or involved in a classroom task in an observable manner. Examples: writing; manipulating objects; using calculator; typing on computer; asking or answering question; drawing; commenting; presenting oral report; reading aloud.
52 ENGAGED - PASSIVE	The student(s) are covertly attending to or involved in a classroom task. Examples: silent reading; listening; watching; thinking.
53 NON-ENGAGED - ACTIVE	The student(s) are not attending to a classroom task and are actively interfering with that task (either for themselves or others). Examples: making irrelevant comments; out of seat; physically disturbing other students;
54 NON-ENGAGED - PASSIVE	The student(s) are covertly not attending to a classroom task. Examples: daydreaming; looking out window; sleeping; remaining silent or immobile during oral or written assignments.
59 CAN'T TELL	An instructional activity is in progress but the nature of the student's behavior is not immediately determinable. Examples: observer lacks sufficient proximity to determine student behavior; nature of expected student response is not clear.

STEEL OBSERVATION SYSTEM

CHECKLIST OF TEACHER BEHAVIORS

TEACHER BEHAVIOR: INSTRUCTION

01 Conveyance of importance of curriculum content
02 Conveyance of importance of pupil performance
03 Use of transition time
04 Degree of task-orientation
05 Organization of time
06 Organization of presentation
07 Organization of materials
08 Sequencing of instruction
09 Pacing of instruction
10 Accuracy of information presented
11 Goal-directedness of instruction
12 Use of a multicultural approach to instruction and curriculum
13 Use of a non-discriminatory approach to instruction and curriculum
14 Clarity of directions
15 Use of different modes of instruction
16 Diversity of questioning patterns
17 Provision of prompting cues to pupils
18 Acknowledgement and use of pupil input and ideas
19 Provision of feedback about pupil performance
20 Provision for basic skill acquisition
21 Enhancement of pupils' knowledge base
22 Provision for successful experiences
23 Provision for practice of acquired skills
24 Provision for mastery of acquired skills
25 Provision for overlapping of acquired skills
26 Provision for transfer of learning of skills
27 Provision for language and vocabulary development
28 Provision for pupil decision-making
29 Awareness and accommodation of individual differences
30 Educational relevance/soundness of instruction
31 Relevancy of materials and instruction to curriculum
32 Comprehensiveness of curriculum
33 Age-appropriateness of materials and instructional techniques
34 Ability-level appropriateness of materials and instructional techniques
35 Interest-appropriateness of materials and instructional techniques
36 Stimulus value of materials and instructional techniques
37 Use of varied instructional resources
38 Appropriateness of oral language patterns
39 Legibility of writing
40 Appropriateness of written language

TEACHER BEHAVIOR: BEHAVIOR MANAGEMENT

50 Awareness of classroom dynamics
51 Clarification of behavioral expectations
52 Control of behavioral antecedents
53 Use of reinforcement
54 Effective use of punishment
55 Use of non-verbal cues
56 Consistency in use of behavior management techniques
57 Adaptability to changing situations
58 Directiveness and assertiveness

TEACHER BEHAVIOR: AFFECTIVE/SOCIAL

70 Sensitivity to pupil needs
71 Ability to relate to pupils
72 Communication of concern and support for pupils
73 Objectivity and fairness in interactions with pupils
74 Modeling of social and personal behaviors
75 Confidence displayed
76 Enthusiasm for role
77 Use of humor
78 Moderation of voice (tone and volume)
79 Cooperation with other school personnel
80 Obtainment of needed information and assistance from others
81 Communication with others about pupils (objectivity, discretion)
82 Positive interaction with pupils

STUDENT TASK ATTENTION

90 Degree of student task-orientation
91 Affective response of pupils
92 Level of group participation
93 Relevancy of participation
94 Variety of participation modes
95 Degree of student task success

STEEL OBSERVATION SYSTEM

OPERATIONAL GUIDELINES FOR

CHECKLIST OF TEACHER BEHAVIORS

TEACHER BEHAVIOR: INSTRUCTION

01 Conveyance of importance of curriculum content - Teacher communicates to students the importance of instructional activities. Teacher informs students of how instructional activities relate to other activities, both in and outside school.

02 Conveyance of importance of pupil performance - Teacher communicates to students that the quality of their performance during instructional activities is important. Teacher communicates why it is important to perform well during instructional activities.

03 Use of transition time -- Teacher keeps transition time to a minimum. Transitions are smooth and effective. Transitions are made at appropriate times. Teacher uses transition time to accomplish desirable outcomes (e.g establish relationships with students, provide feedback, etc.).

04 Degree of task-orientation - Teacher keeps students involved and on-task during instructional activities. Teacher achieves lesson goals and objectives as planned.

05 Organization of time - Teacher allocates appropriate amount of time for instructional activities. Lesson is implemented in manner that uses time effectively.

06 Organization of presentation - Lesson is presented in coherent, logical, and and organized manner. Teacher organizes the classroom resources and students, as necessary, to achieve instructional goals.

07 Organization of materials - Materials used during instructional activities are coherent and logical. Teacher has gathered necessary materials before beginning lesson. Materials used during instructional activities are readily available to students and teacher.

08 Sequencing of instruction - Lesson is presented in a sequential manner. Sequence of instructional activity is appropriate for situation and students. Lesson is sequenced in manner that maximizes student involvement and attention.

09 Pacing of instruction - Pace of instructional activity is appropriate for situation and students. Pace of lesson maximizes student involvement and attention.

10 Accuracy of information presented - Information presented to students is factually correct. Explanations are clear and accurate.

11 Goal-directedness of instruction - Lesson addresses a relevant and desirable instructional goal. Activities are directly related to planned goals and objectives.

12 Use of a multicultural approach to instruction and curriculum - Materials and instructional presentation makes reference to different ethnic groups. Different cultural orientations and values are acknowledged during instructional activities.

13 Use of a non-discriminatory approach to instruction and curriculum - Teacher equitably distributes time, attention, materials, and privileges among all students.

14 Clarity of directions - Teacher provides appropriate and clear directions. Students understand directions and expectations.

15 Use of different modes of instruction - Teacher uses different modes to present instruction, e.g. seatwork, chalkboard, discussion. Teacher appropriately varies mode of instructional presentation throughout lesson.

16 Diversity of questioning patterns - Teacher uses questions that tap different modes of thinking, e.g. convergent, divergent, factual, inferential, evaluative. Teacher uses questioning patterns appropriately for situation and students.

17 Provision of prompting cues to pupils - Teacher uses cues and prompts rather than always providing a direct answer to students. Teacher uses cues and prompts appropriately for situation and students. Teacher varies cues and prompts (e.g. verbal, physical, gestural).

18 Acknowledgement and use of pupil input and ideas - Teacher communicates to students that their ideas and statements are important. Teacher incorporates student ideas in instructional activities.

19 Provision of feedback about pupil performance - Teacher provides immediate and appropriate feedback to students. Feedback is relevant and informative. Feedback enables students to correct their mistakes. Teacher varies manner in which feedback is provided.

20 Provision for basic skill acquisition - Teacher plans and implements activities that promote the acquisition and practice of basic skills, e.g. reading, language arts, mathematics. Activities for basic skill acquisition are appropriate for situation and students.

21 Enhancement of pupils' knowledge base - Teacher plans and implements activities that expand pupils' store of general information and knowledge. Activities designed to enhance students' knowledge base are appropriate for students and situation.

22 Provision for successful experiences - Lessons and activities are leveled and paced so that students may experience success. Teacher provides support and assistance as necessary so that students can succeed.

23 Provision for practice of acquired skills - Teacher plans and implements activities that provide additional and repeated practice in skills that have been previously taught. Sufficient amounts of practice are provided.

24 Provision for mastery of acquired skills - Teacher plans and implements activities that encourage overlearning and mastery of desired skills. Teacher evaluates students to determine mastery.

25 Provision for overlapping of acquired skills - Teacher plans and implements activities that require the practice and application of more than one acquired skill.

26 Provision for transfer of learning of skills - Teacher plans and implements activities that encourage generalization and transfer of skills to new applications and/or settings. Activities designed to encourage transfer are appropriate for situation and students.

27 Provision for language and vocabulary development - Instructional activities enhance students' language skills and vocabulary development. Teacher encourages students to practice and use appropriate oral and written language and vocabulary.

28 Provision for pupil decision-making - Teacher permits students to make their own decisions where appropriate. Teacher provides options or alternatives for students. Decision-making is informally or formally taught.

29 Awareness and accommodation of individual differences - Instructional activities and materials are tailored to the characteristics of individual students - including age, interests, and ability-level.

30 Educational relevance/soundness of instruction - Teacher utilizes appropriate and sound instructional practices (e.g. feedback, success, reinforcement). Instructional activities are relevant, valuable, and worthwhile for students.

31 Relevancy of materials and instruction to curriculum - Within a lesson, materials used and instruction presented are related to curricular goals and objectives. Instructional activities provided over time form a relevant and coherent curriculum.

32 Comprehensiveness of curriculum - The overall curriculum is of appropriate breadth and depth. Teacher plans and implements instructional activities for all appropriate curricular areas.

33 Age-appropriateness of materials and instructional techniques - Materials and instruction are appropriate for students' chronological age.

34 Ability-level appropriateness of materials and instructional techniques - Materials and instruction are appropriately matched to students' abilities.

35 Interest-appropriateness of materials and instructional techniques - Materials and instruction are appropriately matched to the interests of individual students.

36 Stimulus value of materials and instructional techniques - Teacher uses materials and instructional techniques that capture and hold students' attention.

37 Use of varied instructional resources - Teacher uses varied equipment and materials in the presentation of instruction (e.g. printed materials, media, computers, guest speakers, field trips, etc.).

38 Appropriateness of oral language patterns - Teacher uses appropriate and correct oral language, including grammar and dialect. Teacher sets a good example for appropriate oral language usage within the classroom.

39 Legibility of writing - Teacher's handwriting (in instructional presentations, materials, communication, and on the chalkboard) is neat, correct, and legible.

40 Appropriateness of written language - Teacher uses appropriate and correct written language, including style, grammar, and sentence structure. Teacher is a good model of appropriate written language usage within the classroom.

TEACHER BEHAVIOR: BEHAVIOR MANAGEMENT

50 Awareness of classroom dynamics - Teacher demonstrates an awareness of students' roles and interactive behavior within the classroom. Teacher is aware of relationships and interactions among students and between him/herself and students. Teacher manipulates classroom dynamics to minimize disruptions and to achieve desirable outcomes.

51 Clarification of behavioral expectations - Teacher clearly and directly informs students of expectations for their classroom behavior, and of consequences for violating these expectations.

52 Control of behavioral antecedents - Teacher sets up the classroom to promote appropriate behavior (e.g. physical arrangement, seating arrangement, location of materials). Teacher uses resources and materials to avoid potential behavior problems.

53 Use of reinforcement - Teacher appropriately uses praise and rewards that reinforce desirable behavior. Teacher does not reinforce inappropriate behavior. Teacher varies schedules and types of reinforcement.

54 Effective use of punishment - Teacher uses punishment in appropriate situations. Punishment is applied efficiently and fairly. Punishment is applied with a minimum of interruption and disruption to classroom activities. The punishment chosen by the teacher suits the situation.

55 Use of non-verbal cues - Teacher uses physical, gestural, and body-language cues to encourage desirable behavior and prevent/stop undesirable behavior (e.g. raising eyebrows, pointing, proximity control). Students attend to and understand teacher's non-verbal cues. Non verbal cues accomplish desired outcomes.

56 Consistency in use of behavior management techniques - Teacher is consistent in his/her expectations, use of reinforcement and punishment, and behavioral management strategies. Teacher's behavior management techniques are consistent across time and across individuals.

57 Adaptability to changing situations - Teacher adapts his/her actions to changing classroom conditions and individual student needs. Teacher is flexible in use of behavior management strategies, depending on the situation at hand.

58 Directiveness and assertiveness - Teacher is direct and assertive in his/her dealings with students and other school personnel.

TEACHER BEHAVIOR: AFFECTIVE/SOCIAL

70 Sensitivity to pupil needs - Teacher communicates a recognition of individual needs and feelings. Teacher responds to individual needs and feelings when interacting with students.

71 Ability to relate to pupils - Teacher has established a rapport with students. Teacher is able to relate to pupils from different social and cultural backgrounds.

72 Communication of concern and support for pupils - Teacher's attitudes and behavior toward students communicates acceptance, understanding, and warmth. Teacher demonstrates that he/she cares about how well student perform, how much they learn, how they feel, and how they interact with others.

73 Objectivity and fairness in interactions with pupils - In all interactions with students, the teacher remains objective and fair. Differential treatment is not applied unfairly to specific individuals.

74 Modeling of social and personal behaviors - In his/her interactions with others, the teacher sets a good example of appropriate and equitable social behavior.

75 Confidence displayed - Teacher displays a confident demeanor in the classroom and school building. Teacher seems secure in his/her role.

76 Enthusiasm for role - Teacher appears pleased with his/her role and enjoys teaching. Teacher talks favorably about school events.

77 Use of humor - Teacher uses humor appropriately and effectively. Humor achieves desirable outcomes, e.g. increases the stimulus value of activities, enhances student rapport.

78 Moderation of voice (tone and volume) - Teacher's voice quality is appropriate for the situation and students. Teacher's voice is pleasing, clear, understandable, and nondistracting.

79 Cooperation with other school personnel - Teacher establishes cooperative relationships with other teachers and school personnel. Teacher works with others to attain positive outcomes for students and for the school in general.

80 Obtainment of needed information and assistance from others - Teacher communicates and cooperates with others to obtain information and assistance that will ultimately benefit students. Teacher asks for information and assistance in appropriate situations. Teacher is assertive and direct in requesting information/assistance.

81 Communication with others about pupils (objectivity, discretion) - Teacher knows about and adheres to legal guidelines regarding communication of pupil information. Teacher speaks about students in a positive and constructive manner. Teacher shares information as appropriate.

82 Positive interaction with pupils - Teacher-student interactions are positive and pleasing. Teacher and students share mutual respect for one another.

STUDENT TASK ATTENTION

90 Degree of student task-orientation - Student on-task behavior is maximized. Students apply an appropriate amount of effort to classroom activities. Student remain attentive during classroom activities.

91 Affective response of pupils - Students appear to enjoy classroom activities. Students appear to like and respect the teacher. Students are eager to participate in class. Student speak favorably of class activities and the teacher.

92 Level of group participation - All students are attentive and involved in group activities. All students have a chance to participate. All students behave appropriately.

93 Relevancy of participation - Students' participation is relevant to the goals and objectives of the lesson or activity. Students make a worthwhile contribution to the activity.

94 Variety of participation modes - Students can respond to instructional activities in more than one mode, e.g. oral, written, gestural, manipulative. A variety of response modes are used throughout the lesson.

95 Degree of student task success - All students are able to experience some degree of success during a classroom activity.

Software Development. A second major accomplishment during the first year of the STEEL project involved the writing of software packages to allow the collection of trainee behavior using a portable microcomputer. The portable microcomputer was necessary in order to permit field observations, and to provide accurate data storage and immediate feedback to teacher trainees on their teaching performance. After evaluating the merits of various portable microcomputers available at that time, the Epson HX-20 was selected. This is a lap-sized, sophisticated, reliable instrument which is easily programmable in BASIC. Its features make it an ideal data collection instrument: it has an internal clock to signal beginning and ending observation intervals, an earphone jack to provide cues to observers, microcassette audiotape data storage, a small dot matrix printer, programmable function keys, and a 20-character by four line LCD display window. Software packages designed for the Epson were written so that the observation system could be altered easily.

Observer training and field testing. After the software for the microcomputer observation system was completed and field tested, a second step involved developing a procedure for training field observers. First, observers were required to read an observers manual and pass a criterion-referenced test covering the various definitions on the observation system (see Attachment A this section). Second, an operations manual related to use of the Epson HX-20 was written by the project staff and issued to observers (see Attachment B this section). Observers were required to read this manual and become familiar with the operations of the microcomputer and its use in observational activities. Third, observers underwent laboratory training to learn how to code teacher-pupil interactions. This procedure involved having observers

Volume I, Attachment B

STEEL
Portable Computer Operation Guide
for the
Observation Data Collector Program

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This guide is intended to serve as a quick-reference for the operation of the EPSON HX-20 Portable Computer and its accessories in conjunction with the STEEL Observation Data Collector software. This guide is divided into 3 sections which are described below:

Section I
Inside and Outside the EPSON HX-20
This section describes some important 'outside buttons and knobs' on the HX-20, how they are 'pushed and turned', and their function. A short description of the 'inside' of the HX-20 is included to enlarge the observers awareness and understanding of how observational data is captured, processed and stored within the machine.

Section II
STEEL Observation Data Collector Program Functions
This section describes how to activate the STEEL Observation Data Collector software, select and utilize its functions, and manage the storage of observation data on microcassette data tapes.

Section III
Care and Feeding of the HX-20
This section describes the procedures for changing microprinter paper, microprinter ribbons and charging the HX-20's rechargeable nickel-cadmium batteries.

STEEL Portable Computer Operation Guide
Observation Data Collector Program

Section I

Inside and Outside the EPSON HX-20

The EPSON HX-20 Portable Computer is a totally self-contained battery-powered 32K memory portable computer, complete with microprinter for printed output, a 4 line by 20 column LCD (liquid crystal display) viewscreen and microcassette recorder for data/program storage. A unique feature of the HX-20 is its 'non-volatile' memory. This simply means that the contents of the memory of the HX-20 (which may be holding programs and/or data) is NOT destroyed when the power switch is placed in the 'OFF' position. A tiny amount of battery power is used to 'refresh' the memory until the unit is used again. This preservation of memory is very reliable. The unit can be left with the power off for long periods without disturbing the memory contents.

Below is a summary of the relevant operational controls and accessory attachment jacks on the outside of the HX-20:

POWER ON/OFF: This slide switch is located on the right-hand side of the HX-20. When it is pushed towards the rear of the HX-20, power is applied to the microprocessor and the LCD display. The HX-20 will beep twice and a menu of options will appear on the viewscreen.

VIEWING ANGLE: This rotary thumbwheel is located on the right-hand side of the HX-20 just to the rear of the power switch. It is rotated to adjust the viewing angle of the viewscreen in order to provide the clearest display for the observer under different lighting conditions.

PRINTER ON/OFF: This small slide switch is located just below and to the left of the microprinter. When this switch is in the 'off' position, the microprinter is unable to print. Any data which the HX-20 is attempting to print will simply be ignored by the printer. When the switch is in the 'on' position, the printer will be able to print data which the HX-20 sends to it.

PAPER FEED: This small rectangular pushbutton is located just to the right of the PRINTER ON/OFF switch (see above). If the PRINTER ON/OFF switch is in the 'on' position and the PAPER FEED button is depressed, the paper in the microprinter will be advanced 1 line at a time for the amount of time the button is held down. This button has no effect if the PRINTER ON/OFF switch is in the 'off' position.

AC ADAPTOR JACK: This jack is located on the back of the HX-20 and is labelled AC ADAPTOR. It is used to attach the battery charger unit to the HX-20 either for recharging the internal batteries or for using the HX-20 on wall power for short periods should the unit ask to be recharged at an inconvenient time.

RESET: This recessed button is located on the right-hand side of the HX-20 very near the rear. IT SHOULD NOT BE PRESSED UNDER ANY CIRCUMSTANCES. Pressing this button causes ALL of the programs or data which may be in the HX-20's internal memory to be destroyed. The button is recessed to prevent unintentional activation.

Section II
STEEL Observation Data Collector Program Functions

Follow the procedure below to activate the STEEL Observation Data Collector software:

Turn on the power switch. When the program menu is displayed on the viewscreen, select option number 3 (labelled COLLECT) by pressing the number <3> key. In a moment, the STEEL Observation Data Collector software will identify itself on the viewscreen. This indicates that the STEEL Observation Data Collector software has been activated.

On the third line of the viewscreen will be the name and/or version of the observation system which has been placed into the internal memory of the HX-20.

On the fourth line will be a prompt for the observer to select a function. If you are finished using the HX-20, you may turn the power switch off at this time without disturbing any data which you may have collected but which has not been recorded on a tape in the microcassette recorder.

Notice the row of keys below and just to the left of the viewscreen. They are labelled PF1 to PF5. PF stands for programmed function. Just above these keys are alternate labels for these keys. These alternate labels are the functions of the STEEL Observation Data Collector software. You will notice that there are two functions assigned to function keys PF1 and PF5. The top function on each of these keys in activated by pressing either <SHIFT> key and simultaneously pressing the desired key. These top functions of each of these keys are thus called 'shifted' functions.

The pages which follow constitute a summary of the STEEL Observation Data Collector function keys.

****
The CLEAR Function
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This function is used to erase any data which may be in the internal memory of the HX-20. This function DOES NOT erase any data which may be recorded on a tape in the microcassette recorder. The HX-20 will confirm any request to clear data before the erasure is actually done.

****
The TAPE Function
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The TAPE Function offers a choice of 2 subfunctions: SWITCH and CATALOG. The SWITCH subfunction is used to insert or remove microcassettes into or from the microcassette recorder. The CATALOG subfunction is used to produce a listing of the data files on a given tape which is currently in the microcassette recorder.

Below is a detailed description of each of TAPE's subfunctions:

The SWITCH Subfunction

When selected, the SWITCH subfunction first checks to see if a tape is currently in the microcassette recorder. If none is found, the observer is prompted to place a microcassette (either new or old) in the recorder.

The observer is then asked whether the tape which has just been inserted is NEW (has never been recorded on, or has been recorded on and is to be reused as if it were new).

If the observer responds that the tape is new, SWITCH will ask for the observer's code number, the tape number and the side (A or B) of the tape. This information is called the TAPE HEADER. It is used to identify the tape which is currently in the microcassette recorder to the STEEL Observation Data Collector software. Following this the tape is rewound, and the TAPE HEADER is recorded at the very beginning of the tape. The TAPE HEADER is also retained in the memory of the HX-20.

If the observer responds that the tape is not new, SWITCH rewinds the tape and reads the TAPE HEADER into the memory of the HX-20.

The CATALOG Subfunction

The CATALOG subfunction is used to produce a printed listing of the data files on a given tape which is currently in the microcassette recorder. When selected, CATALOG asks the user to turn the printer on and ready the printer. The user is then asked to indicate completion of this task by pressing <Y> for YES on the keyboard.

CATALOG then produces a printed copy of the TAPE HEADER from the memory of the HX-20. Included on the printout are the observer's code number, the tape number, and the side (A or B) of the tape, followed by a list of data files previously recorded on the tape. Information provide. for each data file consists of the datafile number (1-5), date of observation, observer code number, and the code number for the teacher or subject observed.

When printing is completed, the CATALOG asks the user to turn off the printer and indicate completion of this task by pressing <Y> for YES on the keyboard.

****
The OBSERVE Function
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This function is used to code real-time observation data. Prior to coding, header information is entered consisting of the current date, the observer number and the subject number. This information is used to identify the data which is to be coded. Items in the header which have already been specified may be skipped by pressing the <RETURN> key. An individual item in the header (such as the date) may be corrected by pressing the <CLR> key, retyping the item and pressing the <RETURN> key. Once the header information has been entered, a code is entered for each classification in the observation system. These are called the START CODES. After the last start code has been entered, real-time coding begins.

HOW CAN'T TELL CODES ARE HANDLED

Any classification which contains a code corresponding to CAN'T TELL is signalled to the observer by the display of the classification number followed by a question mark as in: 1? 2? 3? This example indicates that classifications 1, 2, and 3 all contain a CAN'T TELL code. As the observer enters a non-CAN'T TELL code for a classification (which should be done as quickly as possible), this display gradually disappears.

FEATURE CODES

Data codes 01 to 09 have been reserved for use as FEATURE CODES and are not valid data codes. Feature codes are used to activate and/or deactivate various features of the STEEL Observation Data Collector software while an observation is taking place. These feature codes are described below.

FEATURE CODES 01 and 02
SHOWING THE CURRENT CODES FOR EACH CLASSIFICATION

It is possible to view the current data code for each classification by 2 methods: ON-DEMAND STATUS or AUTO-STATUS. The selection of these methods is handled by 2 feature codes, 01 and 02, respectively.

If the observer wishes to see the current codes for each classification on-demand, then a 01 is entered as a code. Since this code is not a valid data code, the program will interpret this code as a feature code and display the current data codes for each classification.

If the observer wishes to see the current codes for each classification automatically after each data code they enter, then a 02 is entered as a code. The observer will receive a message to the effect that the AUTO-STATUS feature is now ON, and the current data codes for each classification will be displayed. To turn off the AUTO-STATUS feature code, simply enter the code 02 again. A message that the feature is now OFF will appear. Since this code is not a valid data code, the program will interpret this code as a feature code.

Please note that feature codes 03 to 09 are as yet undefined but may be in subsequent versions of the STEEL Observation Data Collector software.

STOPPING CODING

If an event occurs during coding which necessitates that coding be halted temporarily then the observer should enter a 00 code. At this time, the internal clock of the STEEL Observation Data Collector software is stopped and the observer is asked whether coding is to resume. If the observer is finished coding, the question should be answered N for NO. If the halt was temporary and coding should resume the observer should answer Y for YES.

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The CHECKLIST Function

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This function is used to code checklist data. Prior to coding, header information is entered consisting of the current date, the observer number and the subject number. This header information is identical to the header requested by the OBSERVE function. An item in the header may be changed by pressing the <CLR> key, typing in the desired value for the item, and then pressing the <RETURN> key. Items in the header which have already been specified via the OBSERVE function (and which do not require alteration) may be skipped by pressing the <RETURN> key as each item is displayed in turn.

Once the header information has been entered, changed or skipped, checklist coding begins. Checklist items may be coded in any order. Items which have already had a value specified by the observer will be shown with the previous value in place.

ENTERING A VALUE FOR A CHECKLIST ITEM

A value for a checklist item should be initially entered by first selecting the item, typing in the desired value, and pressing the <RETURN> key.

CHANGING A VALUE FOR A CHECKLIST ITEM

A value for a checklist item may be changed by first selecting the item, pressing the <CLR> key, typing the new value for the item, and pressing the <RETURN> key.

ERASING A VALUE FOR A CHECKLIST ITEM

A value for a checklist item may be erased entirely by first selecting the item, pressing the <CLR> key and then pressing the <RETURN> key.

STOPPING CODING

When the observer is finished coding, a checklist item number of 00 is entered. The screen then returns to a display of the master "Function?" prompt.

****
The REPORT Function
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This function is used to obtain a printed listing of the Observational data stored in the HX-20's internal memory. The REPORT function may be used immediately after an observation and before the current data has been SAVED onto tape, or later when the datafile of interest has been reLOADED into memory from tape. There are three subfunctions within the REPORT: the OBSERVATION subfunction, the CHECKLIST subfunction, and the BOTH subfunction.

The OBSERVATION Subfunction

When selected, the OBSERVATION subfunction produces a printed summary of the percentage of time each category in the five classifications was observed during the total observation period. This information is preceded by a listing of the DATAFILE HEADER information, including date of observation, observer code number, subject number, and the total time for the observation. Only categories actually entered during the observation are reported. Printing of the observation report may be stopped at any point by typing an <S> for STOP.

The CHECKLIST Subfunction

The CHECKLIST subfunction provides a printed listing of the checklist items chosen by the observer, along with the rating given the subject on each of the chosen items. This information is preceded by a listing of the DATAFILE HEADER information including date of observation, observer code number, and subject number. Printing of the checklist report may be stopped at any point by typing an <S> for STOP.

The BOTH Subfunction

When selected, this subfunction provides a printed report which includes both the observation summary and the checklist listing. Order in which information is presented is as follows; DATAFILE HEADER, observation summary, and checklist listing. Printing of the reports may be stopped at any point by typing an <S> for STOP. NOTE: Typing <S> during the printing of the observation summary will result in the machine skipping ahead to the checklist listing. <S> must be typed again if this section of the report is not desired.

****
The SAVE Function
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This function is used to transfer or SAVE data which is currently in the internal memory of the HX-20 to a microcassette tape which has been placed in the microcassette recorder by the observer via the TAPE/SWITCH function.

When the SAVE function key is pressed, the HX-20 checks to see if a tape is in the recorder and if a storage position is available on the tape. If the tape is missing or is full, the screen prompts the user to use the TAPE function to insert a new tape (or turn it over). If the tape is present and is not full, the HX-20 positions the tape automatically at the approppriate location and records the datafile onto it.

The TAPE HEADER in the HX-20's internal memory is also updated with the record. When the SAVE is finished, the screen returns the master "Function?" prompt. It is important to remember that at the end of a SAVE operation, the internal memory has been cleared to accept new observation data.

****
The LOAD Function
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This function is used to transfer or LOAD a datafile from a tape in the microcassette recorder to the internal memory of the HX-20. If the internal memory already contains data, the user will not be allowed to LOAD and will be asked to CLEAR or SAVE the data in the memory before attempting to LOAD again.

When the LOAD function key is pressed, the user is asked for the number of the file to be loaded. Since each side of a tape holds five complete observations, this number will be from 1 to 5. (If the user does not know the file number, the TAPE function and its CATALOG subfunction will provide a printed listing of the datafiles on the tape). When the file number is entered, the tape is positioned automatically and the datafile is loaded into memory. NOTE: Only a copy of the datafile is loaded into memory. The original datafile is still present on the tape. The datafile is now ready to be REPORTED, EDITED, and/or reSAVED (if changes were made.)

STEEL Portable Computer Operation Guide
Observation Data Collector Program

Section III
Care and Feeding of the EPSON HX-20

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WHAT WILL I NEED to Care for and Feed the HX-20?
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You should have some quantity of the following accessory items for the HX-20:

1) A 24-hour timer unit.
2) An EPSON AC Adaptor/Recharger Unit.
3) Extra HX-20 Microprinter paper.
4) Extra HX-20 Microprinter ribbons.

The following pages discuss setting up, when and how to recharge the batteries in the HX-20; how to change the microprinter paper; and how to change the microprinter ribbon.

SETTING UP TO RECHARGE the Batteries in the HX-20

To set up the 24-hour timer unit for timing the recharging of the HX-20's internal batteries, perform the following steps:

1) Locate the 24-hour timer unit in your group of HX-20 accessories. It is a small gray box with an AC plug on its back, an AC outlet on its top, and a large round dial on its front.

2) There are 2 small plastic tabs (each a different color) jutting out from the the large round dial on the front of the timer. These tabs determine the time at which the timer will switch 'ON' and provide power to the AC receptacle on its top, and the time at which the timer will turn off the power to the receptacle. An individual tab may be moved to a new time by pressing down on the tab gently with your thumb and sliding the tab to the desired new time around the dial. Please check and make certain that the 'ON' tab is set for 7 PM and the 'OFF' tab is set for 3 AM. This setting gives a charging time of 8 hours. You may set the 'ON' and 'OFF' times to different (possibly more convenient) settings, but you MUST BE CERTAIN that the time difference between the 'ON' and 'OFF' times is EXACTLY 8 HOURS.

VERY IMPORTANT!
THE RECHARGING PERIOD MUST NOT BE LONGER THAN 8 HOURS!

3) Once the 'ON' and 'OFF' tabs have been adjusted, turn the large round dial CLOCKWISE until the CURRENT TIME is lined up with the raised plastic arrow on the right next to the dial. Then plug the timer into a convenient electrical outlet, preferably higher than floor level. The timer will now turn on and off at the 'ON' and 'OFF' times which have been set, whether or not the AC Adaptor/Recharger unit is plugged into it.

WHEN TO RECHARGE the Batteries in the HX-20

The HX-20 will notify you that its batteries should be re-charged soon by interrupting whatever you are doing and flashing the message 'CHARGE BATTERY!' on the viewscreen for approximately 30 seconds. Then the viewscreen will return to displaying whatever was on it before the interruption took place. If this message is displayed, you should do the following:

1) Turn off the power switch of the HX-20.

2) Plug in the AC Adaptor/Recharger into an electrical ouclet.

3) Plug the other end of the AC Adaptor/Recharger into the jack on the back of the HX-20 labelled: AC ADAPTOR.

4) Turn on the HX-20, re-run the STEEL Observation Data Collector program (see SECTION II), and resume your work. It does not harm the HX-20 to be powered by its AC Adaptor/Recharger unit for short periods. However, you should NOT use the AC Adaptor/Recharger until the HX-20 has told you to 'CHARGE BATTERY!'.

IMPORTANT

If you are using the OBSERVE function when the 'CHARGE BATTERY!' message appears (extremely unlikely), you will NOT be able to resume coding where you left off. You will, however, be able to use all of the other functions, once the AC Adaptor/Recharger has been connected.

5) Later, at your home, at the end of the day, you should recharge the batteries of the HX-20 using the AC Adaptor/Recharger and the 24-hour timer unit.

HOW TO RECHARGE the Batteries in the HX-20

IMPORTANT

MAKE CERTAIN THAT THE POWER SWITCH OF THE HX-20 IS IN THE 'OFF' POSITION BEFORE YOU RECHARGE THE BATTERIES.

To recharge the batteries of the HX-20 at home, perform the following steps:

1) If you have NOT setup the 24-hour timer unit at home to perform the recharging process, please refer to the section above, titled: SETTING UP TO RECHARGE THE BATTERIES IN THE HX-20. Then proceed with the next step below.

2) Plug the AC Adaptor/Recharger unit into the 24-hour timer at or before the 'ON' time for which the timer has been set. Then plug the other end of the AC Adaptor/Recharger into the jack on the back of the HX-20 labelled: AC ADAPTOR. At the 'ON' time, the timer will switch on, and the AC Adaptor/Recharger will begin recharging the batteries in the HX-20. At the 'OFF' time (which MUST be 8 hours later), the timer will shut off. This enables you to perform the recharging process without having to worry about whether or not EXACTLY 8 hours have elapsed. The timer will take care of this for you.

3) After the timer has shut off, you may disconnect the AC Adaptor/Recharger from the timer and from the HX-20. The HX-20's batteries are now fully recharged and ready to go!

PLEASE NOTE

Please remember that whatever data and/or programs may be in the internal memory of the HX-20 when the 'CHARGE BATTERY!' message is displayed, IS PROTECTED. You will most likely be interrupted with the message when more battery power is being called for by some section of the HX-20. Two sections of the HX-20 are likely to trigger the interruption: the microprinter and the microcassette recorder. Both of these devices contain electric motors which require much more battery power to operate than the rest of the computer.

CHANGING the PAPER and RIBBON in the HX-20 Microprinter

Please refer to the small blue and white booklet titled: Operations Manual/EPSON HX-20 Notebook Computer, and read pages 15 (starting at 'Preparing the Printer for Use') to 23 (ending at 'Adjusting the Viewing Angle') for information on changing the microprinter paper and ribbon.

simultaneously view videotapes of classroom interactions and to enter teacher and child behavior codes via a numeric keypad into a microcomputer. The microcomputer instantaneously compared each observers input and halted the progression of the videotape when coders failed to agree. This procedure required observers to discuss discrepancies in their codes to reach a consensus on the proper codes for a particular behavioral sequence. This process continued until all coders reached 90% agreement in at least one training session. A criterion observer on the CITH staff also served periodically as a field observer. Observer drift was prevented by having the criterion observer simultaneously code with each individual observer in actual field settings. If interobserver agreement dropped below 80% in the field with the criterion observer, an observer was recalibrated with additional laboratory training.

In the course of development of the observation system, procedures for conducting observation sessions were also developed. After the graduate supervisors were given several training sessions in how to use the Epson HX-20's to code observation data, they took the machines into the public school classrooms. As practicum experiences were the most appropriate settings in which to evaluate the observation system, the graduate-student supervisors conducted field tests in classroom settings. Observing teacher trainees while they taught, the graduate supervisors entered into the machine the appropriate codes from the observation system. Using data taken from the observation system, the supervisors provided feedback to teacher trainees regarding their classroom performance in bi-weekly individual training sessions.

Trainee Feedback. Preservice teacher trainees received regular feedback regarding their effectiveness in providing ALT related instruction in the field. The observational summary printouts generated by the computer served as the focus for these sessions. In the observation sessions, the supervisor or practicum instructor identified the teacher trainee's appropriate instructional and classroom management behaviors, and when necessary, the behaviors which they needed to change. For example, after several observation periods a supervisor might indicate in a feedback session that the student trainee used adequate rates of positive feedback, but that she or he needed to increase rates of explanation/questioning-need and decrease preparation/administrative duties in the classroom. This procedure, which was followed throughout the semester, provided a continual source of constructive feedback. It not only identified the specific behaviors students needed to change, it allowed student trainees to set personal goals for maintaining or increasing appropriate teaching behaviors and for reducing levels of inappropriate teaching behaviors.

Not only can data from student behavior be recorded, individual data is automatically stored on microcassette tapes resident in the computer itself. Information on these tapes then may be aggregated across student trainee records to yield a composite of group data. These data then may be used for evaluating the performance of an entire group of students and represents one aspect of the program evaluation function the STEEL/IMS offers.

To illustrate how the data may be used, the observational data obtained during four observation periods during the first year of the Project on the initial group of teacher trainees are presented in Table 1. Teacher educational activities consisted primarily of "active instruction" (74.7%) and "passive instruction" (15.8%). The active instructional time was divided between "explanation-planned" (41.9%), "observational monitoring" (16.7%), "structuring/directing" (11.6%), and

TABLE 1: 1983-84 LARGE GROUP DATA

VARIABLE	N	MEAN*	STANDARD DEVIATION*
Group Structure Null	129	2.0	10.6
Group Structure Whole Group	129	68.4	44.1
Group Structure Partial Group	129	14.4	33.1
Group Structure Partial Group Additional Monitoring	129	5.7	20.0
Group Structure Individual Responsibility	129	4.6	18.5
Group Structure Individual Responsibility Additional Monitoring	129	4.3	15.9
Group Structure Can't Tell	129	0.5	3.5
Educational Activity Null	129	2.1	7.4
Educational Activity Active Instruction	129	74.7	29.1
Educational Activity Passive Instruction	129	15.8	25.7
Educational Activity Transition/Procedural	129	6.9	13.3
Educational Activity Can't Tell	129	0.6	3.8
Teacher Instructional Behaviors Null	129	1.4	6.3
Teacher Instructional Preparation Supervision	129	4.3	8.9
Teacher Instructional Behaviors Observational Monitoring	129	16.7	20.6
Teacher Instructional Behaviors Structuring/Directing	129	11.6	14.4
Teacher Instructional Behaviors Explanation/Planned	129	41.9	29.4
Teacher Instructional Behaviors Explanation/Need	129	10.7	18.4
Teacher Instructional Evaluative Feedback	129	4.9	9.6
Teacher Instructional Task Feedback	129	3.0	8.9
Teacher Instructional Behavioral Feedback	129	4.9	9.2
Teacher Instructional Can't Tell	129	0.6	3.2
Primary Student Null	129	2.3	7.4
Primary Student Engaged-Active	129	56.1	35.6
Primary Student Engaged-Passive	129	29.4	34.6
Primary Student Non Engaged-Active	129	7.2	16.2
Primary Student Non Engaged-Passive	129	4.2	10.2
Primary Student Cant't Tell	129	0.9	4.6
Secondary Student Null	129	88.9	27.0
Secondary Student Engaged-Active	129	6.6	20.7
Secondary Student Engaged-Passive	129	1.5	9.2
Secondary Student Non Engaged-Active	129	0.4	2.6
Secondary Student Non Engaged-Passive	129	1.8	9.7
Secondary Student Can't Tell	129	0.8	4.6

Table 1 (cont.)

VARIABLE	N	MEAN	STANDARD DEVIATION
ITEM1	69	2.3	0.7
ITEM2	74	2.5	0.6
ITEM3	87	2.7	0.6
ITEM4	85	2.8	0.5
ITEM5	90	2.6	0.6
ITEM6	83	2.6	0.6
ITEM7	72	2.8	0.5
ITEM8	59	2.7	0.6
ITEM9	76	2.6	0.6
ITEM10	44	2.7	0.7
ITEM11	80	2.7	0.5
ITEM12	48	2.9	0.4
ITEM13	28	2.8	0.4
ITEM14	97	2.5	0.6
ITEM15	67	2.6	0.6
ITEM16	45	2.5	0.7
ITEM17	51	2.7	0.7
ITEM18	74	2.7	0.5
ITEM19	85	2.7	0.5
ITEM20	39	2.9	0.2
ITEM21	61	2.8	0.4
ITEM22	77	2.8	0.4
ITEM23	51	2.9	0.3
ITEM24	13	2.9	0.3
ITEM25	72	2.8	0.4
ITEM26	13	2.8	0.4
ITEM27	52	2.8	0.4
ITEM28	56	2.8	0.4
ITEM29	66	2.8	0.5
ITEM30	59	2.9	0.4
ITEM31	2	3.0	0.0
ITEM32	8	2.5	0.5
ITEM33	97	2.9	0.4
ITEM34	88	2.8	0.5
ITEM35	41	2.9	0.3
ITEM36	72	2.7	0.6
ITEM37	49	2.8	0.5
ITEM38	61	2.6	0.6
ITEM39	34	2.9	0.3
ITEM40	8	2.6	0.7
ITEM41	0	.	.
ITEM42	0	.	.
ITEM43	0	.	.
ITEM44	0	.	.
ITEM45	0	.	.
ITEM46	0	.	.
ITEM47	0	.	.
ITEM48	0	.	.
ITEM49	0	.	.
ITEM50	96	2.5	0.6
ITEM51	105	2.4	0.7
ITEM52	73	2.5	0.6

Table 1 (cont)

VARIABLE	N	MEAN	STANDARD DEVIATION
ITEM53	98	2.3	0.7
ITEM54	29	1.7	0.8
ITEM55	66	2.5	0.7
ITEM56	82	2.4	0.7
ITEM57	56	2.6	0.6
ITEM58	104	2.7	0.5
ITEM59	0	.	.
ITEM60	0	.	.
ITEM61	0	.	.
ITEM62	0	.	.
ITEM63	0	.	.
ITEM64	0	.	.
ITEM65	0	.	.
ITEM66	0	.	.
ITEM67	0	.	.
ITEM68	0	.	.
ITEM69	0	.	.
ITEM70	94	2.7	0.5
ITEM71	108	2.9	0.3
ITEM72	79	2.8	0.4
ITEM73	81	2.9	0.3
ITEM74	81	2.9	0.4
ITEM75	99	2.8	0.4
ITEM76	97	2.8	0.4
ITEM77	47	2.4	0.7
ITEM78	91	2.6	0.6
ITEM79	39	2.9	0.4
ITEM80	8	3.0	0.0
ITEM81	3	2.7	0.6
ITEM82	105	2.8	0.4
ITEM83	20	1.4	0.7
ITEM84	0	.	.
ITEM85	0	.	.
ITEM86	0	.	.
ITEM87	0	.	.
ITEM88	0	.	.
ITEM89	0	.	.
ITEM90	98	2.5	0.6
ITEM91	90	2.5	0.6
ITEM92	80	2.5	0.6
ITEM93	55	2.6	0.6
ITEM94	59	2.6	0.7
ITEM95	80	2.7	0.5

*A dot (.) signifies that because an item was never coded, it is not possible to compute a mean or standard deviation.

See Appendix A for descriptions of coding categories and checklist items.

"explanation-need" (10.7%), while "evaluative feedback" and "behavioral feedback" were each provided 4.9% of the time during this period. Although ideal rates of teacher behavior in these categories based upon children's achievement gains have yet to be determined, available data indicate that, in general, higher rates of active instruction are positively related to student achievement gains. Thus, students falling below group norms in the future might be counseled to concentrate their efforts on increasing specific aspects of their active instructional behaviors. Following the actual recording of teacher behavior, supervisors also rated student trainees on a 95-item checklist of general teaching skills (see Attachment A). Table 1 shows the average group ratings obtained on the checklist items for the first year of the project.

Year 2 Activities

STEEL/MBOS Revision. In the second year of the STEEL project, a revision of the STEEL/MBOS was undertaken. With the feedback received from the observers and the practicum instructor at the end of the previous year, the observation system was re-evaluated and the necessary changes were made. These modifications made the system more responsive to the needs of the field-based observers as well as provided more complete feedback to the teacher trainees.

Observations were begun early in the first semester of classes at Indiana University. Prior to field observations, four training sessions were held with six student teaching supervisors. These sessions included general orientation to and discussion of the STEEL project goals and the STEEL observation system; discussion and illustration of STEEL classifications, categories, and checklist; and instruction in the use of the Epson HX-20 portable microcomputer. After these initial discussions, student teaching supervisors were provided with ample opportunities to practice using the observation system and the Epson HX-20 by coding videotaped segments of teacher-student classroom interactions. A more complete description of specific training activities is provided in Attachment C, entitled Training Activities Schedule.

On the fourth day of training, a 30-minute videotape was coded for the purpose of establishing reliability among student teaching supervisors in the use of the STEEL observation system. Reliability was estimated by using the Flanders reliability coefficient formula (Flanders, 1967). This analysis yielded an overall reliability coefficient of .58. A closer examination of the data indicated that coding of student behavior as engaged active vs. engaged passive and engaged vs. non-engaged were major sources of disagreement. Therefore, it was decided that additional training of observers was necessary to resolve these discrepancies.

A fifth training session was then held, during which categories of student behavior and their operational definitions were reviewed and discussed. Following this discussion, a second reliability check was taken and a Flanders coefficient of .88 was obtained. Since Flanders coefficients above .75 are generally considered adequate (Frick & Semmel, 1978), training was considered complete after this fifth session. The six supervisors and practicum instructor then began classroom observations of seventy-eight undergraduate trainees enrolled in field experience and student teacher coursework. As the STEEL observation system is involved so closely with the undergraduate special education teacher training program, a description of the field experience component will be included in this report.

Volume I, Attachment C

Appendix C. Training Activities Schedule for STEEL Observer Training.

Training Session #1--August 29, 1984--1-4 p.m.

a. Introduce STEEL Project goals & objectives.

b. Introduce STEEL observation system.

c. Discuss STEEL classifications and categories.

d. Discuss STEEL checklist.

e. Discuss checklist items and develop operational definitions for checklist items.

Training Session #2--August 31, 1984--9-12 p.m.

a. Distribute checklist operational definitions and personnel code lists.

b. Review categories and classifications.

c. View videotapes and practice coding with observational system and checklist.

d. Demonstrate operational procedures for EPSON HX-20.

e. Practice coding, reporting, and saving data on EPSON HX-20.

Training Session #3--September 5, 1984--8:45-10:45 a.m.

a. Distribute revised STEEL categories and operational definitions and discuss.

b. Review operation of EPSON HX-20; discuss problems and questions.

c. Practice coding with videotapes.

Training Session #4--September 10, 1984--8-9 a.m.

a. Review Tape Function on EPSON HX-20.

b. Practice coding with videotape.

c. 30 minute reliability check coding videotapes.

Training Session #5--October 5, 1984--8-10 a.m.

a. Discuss any concerns/problems regarding use of EPSON HX-20.

b. Discuss use of STEEL observational categories for student behavior.

c. 30 minute reliability check coding videotapes.

<u>STEEL Observation System Field Tests</u>. The STEEL observation system, during the years of the project, was an integral part of the undergraduate training program in the Indiana University Department of Special Education. The feasibility of its use was thoroughly evaluated in project years 2 and 3. In the second year of the project, preservice teachers were supervised approximately once every two weeks, three to four times in each placement site. The faculty supervisor saw them once in each placement and other visits are made by graduate supervisors. Supervisors scheduled observations in advance and make schedules available to the supervising teachers and students. Supervisors are non-participant observers who typically observe students for 15-30 minutes. Following the observation period the supervisors conferred with the teacher and then with the student for approximately 5-10 minutes respectively. More supervision time was allowed for student teachers: supervisory sessions usually last about 45-60 minutes for field experience students and about 60-90 minutes for student teachers for both the observation and conference.

The STEEL observation system was used during each of these supervisory sessions. Observers (supervisors) typically coded relevant ongoing behavior immediately upon arriving and enter the checklist codes to reflect accurately the classroom climate(s). Supervisors also wrote field notes or anecdotal records of occurrences while present in the classroom. After the initial behaviors were coded, further codes were entered only when changes in behavior categories were observed. This allowed time for observers to intermittently make field notes of specific behaviors to share with the trainees following the observation period. Then supervisors completed the checklist on the computer, and left the room to print out STEEL data. These results were subsequently shared with both student and supervising teacher. Data was then saved on the cassette tape. Cassettes were periodically returned to the STEEL research staff who aggregated and stored data for future retrieval. Data summaries for each were made available to MHP faculty. Examples of the various ways student data could be summarized appear in the STEEL/IMS Volume of this report.

Applications. The STEEL system, developed with faculty input and thus directly related to the goals and objectives of the undergraduate program, added a new dimension to field experience supervision. Behavioral observation provided a real-time coding of teacher and student behaviors. This information was instantly analyzed and summarized; the results and data were shared with students, who can then see the exact percentage (and amount) of time that they were engaged in various teaching activities. Pupil behaviors were precisely determined and recorded. Such feedback helped teacher trainees attain high levels of engaged time among their pupils (see Year 3 report, this section).

The checklist of coding categories and teacher behaviors provides entry-level students with a detailed and comprehensive set of teaching competencies expected of them. Program objectives would thus be specifically defined, and familiarity with the categories encouraged. Ultimately, upon completion of the program, student progress could be examined and evaluated in relation to classroom demands. The behavior codes and checklist results provided faculty with information about specific and general student teaching proficiencies.

The STEEL observation system information also served as an aid to the faculty coordinator in examining deficiencies and inadequacies in a student's program. For example, it revealed a student who may have finished his/her junior year without having had an opportunity to provide large group instruction. Such information allowed the coordinator to make sure the student is placed in a setting in his or her senior year where group instruction was possible. Or again, a student who showed certain weaknesses might be placed in a situation where she/he could practice relevant skills. The system thus pinpoints a student's weak areas and identifies possible remedies.

In another application, data aggregated over a student's third and fourth years can be shared with students for counseling purposes. If a student showed strengths in tutoring-type activities, for example, and weaknesses in large group presentation areas, the student might be counseled to seek a resource room setting to be more successful in his/her first job.

Graduate Supervisors. Although the graduate supervisors initially approached using the computers with some trepidation, after a few hours of successfully working with the STEEL system their apprehension was reduced. Reliability training generally took 10-15 hours in a small group setting. All supervisors received this training have gained a sense of confidence in using the computers which has undoubtedly transferred to other situations in which they will be required to use computers. This growth in competence in the use of technology was part of the stated aims of the STEEL proposal and one of the accomplishments that was perhaps most easy to document. Although many graduate students have experienced some frustration and occasional problems (e.g., computer batteries occasionally needing to be charged in the middle of an observation), in general the supervisors found the computers reliable and fairly easy to use. During field testing, many changes were made in the software to curb problems they had initially experienced.

Students' Reactions to STEEL/MBOS. As with the graduate supervisors, the undergraduate students were slightly alarmed when they heard that a computerized observation system was to be implemented during supervision. Gradually, they became accustomed to their use and were eager to get the information printout the STEEL/MBOS provides. Reactions to the STEEL/MBOS data are varied, as evident in the evaluation data gathered during the final year of the project. Some students preferred the field note information and others appeared to be more interested in the behavioral observations and checklist categories. The majority of students indicated that a combination of the two feedback forms was optimal in increasing their teaching skills. Since both methods complement each other, most students took serious interest in both forms of feedback.

Pupils' and Supervising Teachers' Reactions to STEEL/MBOS. Children and adults in the field placements had various reactions to the computers. Comments ranged from "Isn't that cute" to more sophisticated questions regarding the computer's capabilities. Most teachers seemed to be sincerely interested in the use of the computers and seemed to appreciate the information their field students received.

Year 3 Activities

Preservice teacher group data. In the thi year of the STEEL project, activities related to the STEEL/MBOS were confined to summative evaluation of the system. As with Years 1 and 2, data were summarized regarding the entire preservice teacher group in the department of special education. This summary appears in Table 2 .

Effectiveness study. In addition to evaluating the performance of preservice teachers as a group during the third year of the project, a controlled experimental study was conducted by project staff which

TABLE 2: Group Performance Data, Year 3

STEEL/IMS Student Observation Data Summary for all students

Period:	AUG 01, 1985 to JUL 01, 1986
Number of Students (in summary):	75
Number of Observations (in summary):	535
Amount of Observation Time (in summary):	13034.5 minute(s)
Avg. Number of Observations per Student:	7
Avg. Amount of Observation Time per Student:	173.8 minute(s)

OBSERVATION CODE SUMMARY

GROUP STRUCTURE	PERCENT	MINUTES
NULL	2.7%	(346.4)
WHOLE GROUP RESPONSIBILITY	58.8%	(7658.1)
PARTIAL GROUP RESPONSIBILITY	17.9%	(2336.1)
PART GRP RESPONS WITH ADDTL MONITORING	6.5%	(844.4)
INDIVIDUAL RESPONSIBILITY	10.3%	(1339.1)
INDIV RESPONS WITH ADDTL MONITORING	3.7%	(485.8)
CAN'T TELL	.2%	(24.6)

EDUCATIONAL ACTIVITY	PERCENT	MINUTES
NULL	3.0%	(388.9)
ACTIVE INSTRUCTION	79.6%	(10378.2)
PASSIVE INSTRUCTION	10.5%	(1364.5)
TRANSITION	6.8%	(887.8)
CAN'T TELL	.1%	(15.1)

TEACHER INSTRUCTIONAL BEHAVIORS	PERCENT	MINUTES
NULL	2.5%	(325.7)
PREPARATION+SUPERVISION	5.1%	(665.4)
OBSERVATIONAL MONITORING	23.9%	(3112.1)
STRUCTURING+DIRECTING	18.8%	(2449.6)
EXPLANATION+QUESTIONING-PLANNED	38.6%	(5028.9)
EXPLANATION+QUESTIONING-NEED	2.9%	(372.1)
EVALUATIVE FEEDBACK	4.4%	(579.6)
TASK ENGAGEMENT FEEDBACK	1.7%	(218.3)
BEHAVIORAL FEEDBACK	2.1%	(276.1)
CAN'T TELL	.1%	(6.6)

STUDENT(S) BEHAVIORS (TARGET GROUP)	PERCENT	MINUTES
NULL	2.9%	(381.7)
ENGAGED-ACTIVE	69.0%	(8998.4)
ENGAGED-PASSIVE	17.7%	(2309.4)
NON-ENGAGED-ACTIVE	5.0%	(651.0)
NON-ENGAGED-PASSIVE	5.3%	(691.2)
CAN'T TELL	.0%	(2.9)

STUDENT(S) BEHAVIORS (MONITORED GROUP)	PERCENT	MINUTES
ENGAGED-ACTIVE	69.5%	(961.3)
ENGAGED-PASSIVE	17.6%	(243.0)
NON-ENGAGED-ACTIVE	6.3%	(87.5)
NON-ENGAGED-PASSIVE	5.9%	(81.5)
CAN'T TELL	.8%	(10.6)

STEEL/IMS Student Observation Checklist Summary for all students

Period: AUG 01, 1985 to JUL 01, 1986
Number of Students (in summary): 75
Number of Observations (in summary): 535
Amount of Observation Time (in summary): 13034.5 minute(s)
Avg. Number of Observations per Student: 7
Avg. Amount of Observation Time per Student: 173.8 minute(s)

OBSERVATION CHECKLIST SUMMARY

TEACHER BEHAVIOR: INSTRUCTION	LOW	MED	HI	NOT CODED
CONVEYANCE OF IMPORTANCE OF CURRICULUM	37	118	177	203
CONVEY IMPORTANCE OF PUPIL PERFORMANCE	22	141	200	172
USE OF TRANSITION TIME	10	75	271	179
DEGREE OF TASK-ORIENTATION	8	76	352	99
ORGANIZATION OF TIME	8	72	296	159
ORGANIZATION OF PRESENTATION	4	60	246	225
ORGANIZATION OF MATERIALS	1	43	281	210
SEQUENCING OF INSTRUCTION	1	48	263	223
PACING OF INSTRUCTION	8	57	301	169
ACCURACY OF INFORMATION PRESENTED	4	39	183	309
GOAL-DIRECTEDNESS OF INSTRUCTION	5	44	283	203
USE OF MULTICULT APPROACH TO INST+CURR	5	4	55	471
USE OF NON-DISCRIM APPROACH TO INST+CURR	6	22	154	353
CLARITY OF DIRECTIONS	9	88	307	131
USE OF DIFFERENT MODES OF INSTRUCTION	22	56	139	318
DIVERSITY OF QUESTIONING PATTERNS	13	86	173	263
PROVISION OF PROMPTING CUES TO PUPILS	5	66	227	237
ACKNOWLEDGEMENT+USE OF PUPIL INPUT+IDEAS	12	87	207	229
PROVIDE FEEDBACK ON PUPIL PERFORMANCE	10	92	287	146
PROVISION FOR BASIC SKILL ACQUISITION	3	37	179	316
ENHANCEMENT OF PUPILS' KNOWLEDGE BASE	1	47	128	359
PROVISION FOR SUCCESSFUL EXPERIENCES	4	50	268	213
PROVISION FOR PRACTICE OF ACQUIRED SKILL	2	30	140	363
PROVISION FOR MASTERY OF ACQUIRED SKILLS	6	26	24	479
PROVISION FOR OVERLAP OF ACQUIRED SKILLS	7	18	35	475
PROVISION FOR TRANSFER OF LRNG OF SKILLS	9	15	32	479
PROVISION FOR LANGUAGE+VOCAB DEVELOPMENT	3	37	201	294
PROVISION FOR PUPIL DECISION-MAKING	9	42	154	330
AWARENESS+ACCOMODATION OF INDIVID DIFFER	5	68	215	247
EDUCTL ELEV+SOUNDNESS OF INSTRUCTION	4	40	228	263
RELEVANCY OF MATS+INSTR TO CURRICULUM	3	20	114	398
COMPREHENSIVENESS OF CURRICULUM	3	22	21	489
AGE-APPROPRIAT MATERIALS+INST TECHNIQUES	0	26	330	179
ABIL-LEVEL APPROP OF MATERIALS+INST TECH	2	44	278	211
INTEREST-APPROP OF MATERIALS+INST TECH	2	48	263	222
STIMULUS VALUE OF MATERIALS+INST TECH	10	58	199	268
USE OF CLASSROOM RESOURCES	19	26	84	406
APPROPRIATENESS OF ORAL LANGUAGE PATTERN	3	54	237	241
LEGIBILITY OF WRITING	1	18	80	436
APPROPRIATENESS OF WRITTEN LANGUAGE	1	15	21	498

TEACHER BEHAVIOR: BEHAVIOR MANAGEMENT	LOW	MED	HI	NOT CODED
AWARENESS OF CLASSROOM DYNAMICS	29	122	293	91

TABLE 2: (cont.)

STEEL/IMS Student Observation Checklist Summary for all students

CLARIFICATION OF BEHAVIORAL EXPECTATIONS	26	112	266	131
CONTROL OF BEHAVIORAL EXPECTATIONS	10	83	97	345
USE OF REINFORCEMENT	20	107	219	189
EFFECTIVE USE OF PUNISHMENT	11	34	36	454
USE OF NON-VERBAL CUES	10	80	106	339
CONSISTENCY IN USE OF BEH MANAGE TECHS	16	55	152	312
ADAPTABILITY TO CHANGING SITUATIONS	2	30	219	284
DIRECTIVENESS AND ASSERTIVENESS	8	83	261	183

TEACHER BEHAVIOR: AFFECTIVE/SOCIAL	LOW	MED	HI	NOT CODED
SENSITIVITY TO PUPIL NEEDS	7	94	285	149
ABILITY TO RELATE TO PUPILS	1	54	371	109
COMMUNICATES CONCERN+SUPPORT FOR PUPILS	1	48	260	226
OBJECTIVE+FAIR IN INTERACT WITH PUPILS	1	34	254	246
MODELING OF SOCIAL & PERSONAL BEHAVIORS	1	38	332	164
CONFIDENCE DISPLAYED	7	51	363	114
ENTHUSIASM FOR ROLE	5	78	313	139
USE OF HUMOR	9	54	76	396
MODERATION OF VOICE(TONE+VOLUME)	6	53	299	177
COOPERATION WITH OTHER SCHOOL PERSONNEL	1	16	179	339
OBTAINS NEEDED INFO+ASSIST FROM OTHERS	3	18	65	449
TALKS WITH OTHERS RE:PUPILS OBJ+DISCRET	1	13	47	474
POSITIVE INTERACTION WITH PUPILS	1	37	336	161

STUDENT TASK ATTENTION	LOW	MED	HI	NOT CODED
DEGREE OF STUDENT TASK-ORIENTATION	17	112	316	90
AFFECTIVE RESPONSE OF PUPILS	6	88	254	187
LEVEL OF GROUP PARTICIPATION	8	79	185	263
RELEVANCY OF PARTICIPATION	1	30	186	318
VARIETY OF PARTICIPATION MODES	20	46	96	373
DEGREE OF STUDENT TASK SUCCESS	0	54	266	215

evaluated the effectiveness of the STEEL/MBOS. This study, which has been summarized in the overview section, assessed the effects of the STEEL/MBOS in producing change in preservice teachers' instructional behavior and their effects on handicapped pupils' classroom behavior. It is anticipated that the results of this study will be published in an appropriate journal in the field. The following document provides the rationale, method, and results of this evaluation.

TABLE OF CONTENTS

ABSTRACT

Microcomputer-Based Assessment of Preservice Teaching Behavior: Objective Evaluation of Skill Development

Preservice teachers typically receive field note feedback regarding their classroom teaching performance. In an attempt to standardize feedback, isolate specific teacher behaviors for improvement, and collect normative data across students that could be used for formative as well as program evaluation, this study presented twenty-seven special education students objective performance information regarding research-based teaching strategies. After a baseline phase of six weeks, students were randomly assigned to two groups; differential training was provided each group. Group A students received information regarding effective teaching practices involving the concept of Academic Learning Time (ALT) and the relationship between this information and a microcomputer-based observation system. Subsequent field observations for this group provided feedback on ALT teaching behaviors, a three-point rating of their academic and behavior management strategies, and general information from traditional field notes. Alternate training received by Group B students involved humanistic classroom management techniques; they received only field note feedback. Following this first intervention phase,

Group B students received the research-based training, and a second intervention phase ensued where both groups received computer feedback. Thus, a multiple-baseline research design was used to examine the effects of the specific training/feedback procedures. Data was analyzed both between and within groups to determine the effects of the differential training.

The observation system involved a real-time coding feature which recorded actual duration of observed behaviors in five different categories. Using this procedure, three teacher behaviors and classroom student engagement rates were examined. Results demonstrated that the computer-based feedback influenced students to significantly increase their rates of effective teaching behavior, while the field note feedback improved performance on ALT behavior categories only slightly. Pupil engagement rates also increased, but failed to reach the predetermined level of significance. Student attitudes toward the computer-based observation system were more positive following the ALT training session. The results demonstrate that an objective observation/ feedback system is highly effective in training preservice teachers to utilize specific behaviors in their instructional repertoires.

REVIEW OF THE LITERATURE

Classroom Instruction Research

Research on Presage Variables

The history of research on classroom instruction is comparatively brief, spanning only about the last 80 years. Initial efforts in this field concentrated on identifying presage variables which affected student achievement. Early educational researchers attempted to link teacher traits such as intelligence, flexibility, emotional stability, knowledge of subject matter, and style of teaching to instructional outcomes. However, this line of research failed to establish clear relationships between teacher characteristics and student achievement. Studies in this area generally concluded that teacher traits, besides having low stability coefficients, did not always correspond with the quality of classroom instruction (Gage, 1963; Getzels & Jackson, 1963; Biddle & Ellena, 1964).

Other research efforts attempted to discover relationships between student characteristics and achievement. Socioeconomic status, number of siblings, paternal occupation, and IQ were but a few of the variables studied. While correlational data were obtained for each, none accounted for the majority of the variance observed in student achievement scores. The general conclusion emerging from this line of research was that traits or characteristics, singly or in various combinations, could not be used as a valid predictor of teaching effectiveness (Howsam, 1960).

In the early 1960's, plummeting test scores, the launching of Sputnik, and the civil rights movement all influenced the federal government to more closely examine the educational process, including teacher education (Schalock, 1983). A number of curriculum reform efforts were initiated during this period (Howsam, Corrigan, Denemark, & Nash, 1976), but they failed to produce any significant or lasting results. Disillusionment with educational practices intensified in the mid-1960's, when initial reports of Head Start programs indicated that the massive funding of preschool programs was not paying educational dividends (Good, 1983); a controversial report (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & York, 1966) cast further doubts as to whether variations in teachers' experience made any difference in students' academic achievement.

Research on Teacher-Pupil Interactions

During this same period, other researchers began to investigate the educational process from a different perspective. Their research focused on the time students spent engaged in mastering academic skills as well as their academic progress, judged by their performance on standardized achievement tests. Much of this research involved observing teacher-pupil interactions: objectively evaluating what teachers were doing as they went about their teaching and, in turn, what students were doing in response to teacher actions.

Early contributors to teacher-pupil interaction research included Carroll (1963) and Bloom (1964; 1973; 1977). Carroll (1963) devised a model of school learning which posited a link between time and achievement. In this model, time was viewed as a critical variable in classroom learning and students differed most in the amount of time they required to master a given instructional objective. Carroll's model is shown in Figure 1.

Insert Figure 1 about here

Carroll's formula, simply stated, illustrates that the degree of learning equals the time actually spent in learning divided by the amount of time needed to learn. The parts of the equation are, in turn, influenced by other factors, specifically: the amount of time actually spent learning depends upon (a) perseverance--the amount of time the learner devotes to mastering a task, and (b) opportunity--the time and number of trials the teacher allows for learning. The amount of time needed for a student to learn depends upon (a) aptitude--not the student's learning capacity, but the time it takes him or her to learn a particular fact or concept; (b) ability--the student's mode or style of learning relative to the task at hand; and (c) quality of instruction--the effectiveness of the teachers' instruction.

$$\text{Degree of Learning} = \frac{\text{Amount of time actually spent learning: a) perseverance, b) opportunity}}{\text{Amount of time needed to learn: a) aptitude, b) ability, c) quality of instruction}}$$

Amount of time actually spent learning

a) perseverance

b) opportunity

Degree of Learning = ----------------------------------

Amount of time needed to learn

a) aptitude

b) ability

c) quality of instruction

Figure 1. Carroll's (1963) Model of Learning

Perhaps the major contribution of Carroll's model of learning to present views of the educational process involves the reconceptualization of student aptitude as a function of time. According to this view, time, not innate ability, assumes a critical role in achievement. Subsequent research on time in instruction and student learning has built upon Carroll's early work. For example, Bloom's (1973) analysis of standardized test norms at the elementary school level revealed that the achievement level attained by the highest 20% of the students on a given standardized test was attained by about 50% of the students a year later, and by about 80% of the students two years later.

The work of Carroll (1963) and Bloom (1973) focused research efforts on interactions among classroom student, teacher, and instructional variables rather than on characteristics of students and teachers (Cruickshank, 1976; Rosenshine & Berliner, 1978; Brophy, 1979). This line of research is often referred to as "process-product", where process includes both teacher and student behaviors that have mediating effects on student performance and the product, or outcome, is represented by observed changes in student behavior--generally increments in performance on standardized achievement tests. In the earliest stages of this research thrust, naturalistic classroom observations were conducted and teacher behaviors identified which correlated positively with student performance gains. In subsequent studies, these variables were manipulated experimentally to determine their effect on student achievement (Stallings, 1976; McDonald & Elias, 1976; Good & Grouws, 1979). These research efforts had two distinguishing characteristics: first, they were based upon the findings of correlational studies, rather than on educational or psychological theory; second. they measured the degree to which teacher training influenced their actual classroom behavior (Gage & Giaconia, 1981).

One of the most well known studies in this research genre was the Missouri Mathematics Project (Good & Grouws, 1979). In this study, 40 third- and fourth-grade teachers were initially selected for the stability of their instructional procedures. The sample was divided into two equivalent groups; half received a five-page manual containing a system of sequential, instructional steps for teaching mathematics, e.g., use of demonstrations, provision of uninterrupted successful practice, and maintainance of momentum in the classroom. The teachers read the manual, received two 90-minute training sessions, and proceeded to implement the key instructional behaviors in their mathematics lessons. In a deliberate attempt to create a Hawthorne effect, members of the control group were informed regarding the purpose of the study but they did not receive the procedures manual and were told to continue to instruct in their own style. Results showed that teachers in the treatment group implemented many of the key instructional behaviors and that their students' math test scores increased significantly, from the 26th to the 57th percentile on national norms. These gains continued for at least some time following the treatment. Moreover, student attitudes were significantly higher among the experimental group, and teachers in the project indicated that they felt the program was practical and that they planned to continue using it in the future (Good, 1983). This study was particularly noteworthy because of the significant student gain obtained in only four months, and because training time and expense was minimal.

Research on Academic Learning Time

Another line of educational research which has emerged in the last decade involves identifying effective teacher behaviors which affect student achievement. One of the more widely accepted studies in this area was the Beginning Teacher Evaluation Study, or BTES. (Fisher, Berliner, Filby, Marliave, Cahen, Dishaw, & Moore, 1978). After examining the effects of various teacher behaviors on student achievement scores in second and fifth grade classrooms, these researchers developed a concept they termed Academic Learning Time (ALT). Academic Learning Time refers generally to the time students spend actively engaged in completing academic tasks with a high rate of success (Berliner, 1977). Since this concept was first proposed, there has been virtually universal agreement among researchers that ALT is a major influence on student achievement (Lomax & Cooley, 1979).

The first two components of ALT are allocated time, the amount of time the teacher sets aside for learning, and engaged time, the amount of time the student actually spends actively learning. The third component is success rate. Each of these aspects of ALT will be discussed.

Allocated time. Studies have found great variation in time allocated for learning in educational settings and compared these with student outcome variables. Harnischfeger and Wiley (1978), for example, found that the length of a school day in the same school district varied by 45 minutes for two second-grade classrooms. First-grade classrooms have been found to vary as much as 1 hour and 30 minutes in length of school day; secondary class periods for remedial reading from 40-55 minutes (Stallings, 1975; Stallings, Needels, & Stayrook, 1979). Even larger differences in time allocated for instruction were observed between individual classrooms. The BTES (Fisher et al., 1978) results revealed that, in fifth grade reading and reading-related instruction, the average amount of allocated time varied between classes from about 60 minutes to about 140 minutes per day. The latter class thus received 48 more hours of reading instruction over the course of a school year than the former. As time spent in reading has been found to correlate highly with gains in student achievement

(Rosenshine & Berliner, 1978; Fisher et al., 1978), even such seemingly minor variations in instructional time can mean critical differences in student achievement. An example of the importance of time allocated to academics is found in a recent report by Walberg (1985). After summarizing 25 research studies, it was observed that 95.4% of them found time in learning to be positively correlated with student gain.

Engaged time. Allocated time appears to be a necessary but insufficient condition for learning. Although time spent on academic subjects has been proven an important variable for predicting student achievement, studies which isolated and examined only the effects of allocated time have failed to obtain significant educational results (Rosenshine, 1980). A more important factor appears to be student engagement, the amount of time students spend actively engaged in a task. This variable has consistently been more closely related to academic gain than allocated time, yet observed student engagement rates have been found to vary widely. Powell and Dishaw (1978), for example, reported that the engaged time of second-grade students in daily reading lessons ranged from 39 to 98 minutes, and that of fifth-grade students from 49 to 105 minutes. The BTES researchers (Fisher et al., 1978) observed classes that had average engagement rates of about 50 per cent during reading and math instruction, i.e., students in these classes were attending to their work half of the time. In other classes, the average engagement rate approached 90 per cent. These results indicate that, although teachers in two classes might both allocate the same amount of time to reading, one could have almost twice as much student engagement as the other.

As previously mentioned, the variable of student engagement has been significantly related to academic achievement. Evertson (1982) reported that low-achieving junior high students were engaged an average of 40 per cent of the time in academic activities compared with 85 per cent engagement for high-achieving students.

The consistent findings of these studies indicates that it is critical for teachers to strive for high student engagement rates. Teachers can and do influence classroom levels of student engagement. For instance, teachers who frequently engage in substantive interactions (e.g., explanations, demonstrations, taskoriented questions), who emphasize whole group involvement, and who provide feedback are most successful in maintaining high student engagement during seatwork (Good & Grouws, 1979; Rosens .e, 1980).

Success rate. The third aspect of ALT is success rate. Tasks in which students are engaged must be at an appropriate level of difficulty. If tasks are too difficult, student engagement rates have been found to decrease; if they are too easy, students do not learn new material and engagement rates may decrease. But when the task is at the proper level of difficulty, students will spend more time on task (Fisher et al., 1978).

From the preceding discussion, it can be seen that studies have successfully identified a number of teacher behaviors which significantly increase student academic achievement (Emmer, Evertson, & Anderson, 1980; Brophy, 1981). More effective teachers, those whose students show greatest academic gains, provide clear instructions regarding classroom assignments, actively monitor their students as they work, and provide assistance when it is needed. They also spend less time in transitional activities, student behavior management, preparation of materials, and explanation of assignments. These teacher behaviors have all been found to be positively associated with student gain (Stallings, Cory, Fairweather, & Needels, 1977; Stallings et al., 1979; Stallings & Kaskowitz, 1974).

Summary of Classroom Instruction Research

The studies reviewed above indicate that, although early educational research was relatively inconclusive regarding variables which affected student performance, in the past ten to fifteen years researchers have accumulated a small but consistent body of experimental evidence demonstrating that certain teacher behaviors produce greater academic gains in students, regardless of their ability (cf., Fisher et al. 1978; Stallings & Kaskowitz, 1974; Stallings et al., 1977; Gage &

Coladarci, 1980). Selected teacher behaviors which have been demonstrated to have a positive relationship with student academic achievement are summarized in Table 1.

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Insert Table 1 about here

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Specific findings in this area show, for example, that student engagement rates are related to achievement; low student achievement is associated with time spent off-task; the amount of teacher time spent on instruction-related interactions is positively related to student achievement; and the amount of teacher time spent on management-related interactions is negatively related to student achievement (Wang & Walberg, 1983). More effective teachers tend to use active instructional strategies such as providing clear explanations and questions, monitoring student seatwork, providing immediate corrective feedback, and reducing the amount of transition time in the classroom. These are just a few of the conditions necessary for effective teaching and learning.

Teacher Education Research

While the research literature has clearly demonstrated the potency of certain teaching strategies and procedures, preservice teachers rarely receive systematic information regarding research-based practices (Prehm, 1976, Drew, Preator, & Buchanan, 1982; Lewis & Blackhurst, 1983). Rather, techniques and practices are

Table 1

<u>Summary of Studies Which Have Identified Effective Teaching Behaviors</u>

	Study Referent				
	1	2	3	4	5
Teacher Questions	x	x	x		x
Active Instruction	x	x	x	x	x
Academic Orientation	x	x	x	x	x
More Time Allocated for Instruction	x	x	x	x	x
Reduced Transition Time			x	x	x
Student Engagement	x	x	x	x	x
Positive or Neutral Corrective Feedback	x	x		x	x
Effective Classroom Management Skills	x	x	x	x	x
Teacher Supervision	x		x	x	

<u>Note</u>. 1=Stallings & Kaskowitz (1974)

2=Stallings, Cory, Fairweather, & Needels (1977)

3=Brophy & Evertson (1976)

4=Good & Grouws (1979)

5=Anderson, Evertson, & Brophy (1978)

(<u>table continues</u>)

Table 1

Summary of Studies Which Have Identified Effective Teaching Behaviors

	Study Referent				
	6	7	8	9	10
Teacher Questions		x	x		
Active Instruction	x			x	
Academic Orientation	x	x	x	x	x
More Time Allocated for Instruction	x		x	x	x
Reduced Transition Time	x		x	x	x
Student Engagement	x	x	x	x	
Positive or Neutral Corrective Feedback	x		x	x	
Effective Classroom Management Skills	x	x	x	x	x
Teacher Supervision	x	x		x	

Note. 6=Fisher, et al. (1978)

7=Soar; Soar & Soar (1973, 1976)

8=Stallings, Needels, & Stayrook (1979)

9=Anderson & Evertson (1978)

10=Gage & Coladarci (1980)

typically based upon subjective hunches and hypotheses growing out of experience (Cyphert, 1972; Griffin, 1983), a situation which has changed little over the years (Sykes, 1983). This is a disturbing commentary on the status of teacher education, since a large-scale study of student teaching (Griffin, Barnes, Hughes, O'Neal, Defino, Edwards, & Hukill, 1983) and experimental studies of inservice teacher education (Griffin, 1983; Wang & Walberg, 1983; Gage & Coladarci, 1980; Leach & Dolan, 1985; Sparks, 1986) all suggest that teachers can become proficient users of research-based practices, given appropriate information.

In light of these findings, it seems obvious that, to be maximally effective, teacher training programs should be based upon the most current research regarding effective teaching and learning and should provide prospective teachers with clear and consistent feedback regarding their performance in applying effective teaching behaviors. If increasing student achievement is an important educational goal, the tendency for training programs to be lax in conveying relevant research-based information to students (Lanier & Little, 1986; Feistritzer, 1984) seems ill-advised, since research on effective teaching has shown that what teachers do in the classroom is second only to what students know from previous experience in predicting student outcomes (McDonald, 1976).

Thus, teacher behavior is clearly the most promising manipulable variable discovered to date for improving student performance (Peterson, 1986). But to what extent have teacher training programs attempted to incorporate research results into their training activities? Three recent studies bear on this issue. Waimon (1983) divided preservice teachers into two groups and provided training to only the experimental group. Following training, the preservice teachers worked with high school pupils for 50 minutes, five times per week for three weeks. Student academic learning time (ALT) was recorded daily by trained observers as well as by supervising teachers. The dependent measure was pupil performance on a multiple choice test. Students in the experimental group nearly doubled their amount of active teaching behavior. While scores on the pupil achievement measure favored the experimental group, they did not reach a significant level. This finding may be due to the relatively short duration of the experiment, or to the minor instructional role played by the student teachers in this study.

Madike (1980) assigned student teachers to teach five-week mathematics units to comparable ninth grade classes. One group of student teachers had experienced a microteaching program which trained them in specific teaching skills. A second group had been observed and given feedback by supervising teachers, but not necessarily on the skills stressed in the microteaching program. A third group was given no specific preparation for the teaching experience. Each student teacher was videotaped during a 35-minute lesson, and a 10-minute segment was rated for frequency of use of nine skills taught in the microteaching program. Results indicated that the microteaching group had higher frequencies of behaviors related to the skills, and that their use correlated positively with student achievement. Thus, in this study, feedback on instructional performance in a laboratory training situation showed positive transfer to the actual instructional setting.

Ponzio (1984) reported a study in which five preservice and five inservice teachers were questioned regarding their level of awareness of the effective teaching research. The cooperating teachers were unfamiliar with the research while the student teachers were "relatively unaware" of effective instruction practices. After receiving training, changes in teachers' use of effective instructional behaviors were examined with three different types of instruments: pre-post paragraphs written by the participants regarding research knowledge and application; pre-post classroom observations on teacher behaviors; and teacher interviews. Observational data indicated that both groups increased their use of effective instructional behaviors. Additionally, the cooperating teachers unanimously identified ALT as being most useful for helping them become more effective in their teaching and supervisory roles, while the student teachers unanimously mentioned active teaching behavior feedback as being most helpful to their instructional skill development.

These studies demonstrate that research information can positively influence preservice teacher behavior. Yet very few teacher training programs incorporate research findings, even though programs weak in this professional orientation to teaching have been demonstrated to have negative effects. It is not uncommon for student teachers to intern with classroom teachers who themselves have little experience in the supervisory process and who may not always display effective instructional behaviors (Seperson & Joyce, 1973; Copeland, 1978; Griffin & Hukill, 1982). For example, in one study bearing on this issue, Johns and Gee (1984) divided both cooperating and student teachers into two groups (low and high active teaching behaviors) based upon classroom observations and personal statements regarding instructional techniques. After a semester-long practicum it was found that, although student teachers may come to a classroom displaying high levels of active teaching behaviors, these effective behaviors are minimized over time by the cooperating teacher's effect. A training program which conveyed effective teaching behaviors and evaluated student application of those behaviors in an objective manner would potentially alleviate these negative modeling effects.

Knowledge and Skill Transfer Research

Another line of research regarding effective teacher education involves variables related tc transferring knowledge to actual practice situations. After reviewing the training literature, Joyce and Showers (1982) reported that four components of training--presentation, demonstration, practice, and feedback--are sufficient to induce many teachers to transfer recommended practices to the classroom, while coaching may be a necessary fifth component for some. Training teachers to discriminate, generate, and evaluate their interactive teaching skills additionally depends upon (a) specification of target behaviors, (b) reliable, valid performance information, (c) immediate availability of feedback information to the trainee, and (d) access to data from previous training trials.

Utilizing this methodological framework, preservice teachers increased their use of effective teaching behaviors over baseline rates by a ratio of nearly three to one (Semmel, Sitko, Semmel, Frick, & Hasselbring, 1976; Semmel, 1978). In Project CARTLO (Computer-Assisted Research into Teaching-Learning Outcomes), preservice teachers rated (a) the use of observation data to evaluate effectiveness of teaching methods, and (b) the use of computers to list ou observation information as valuable contributors to their professional growth (Rieth & Frick, 1978). The effect of these specific teaching behaviors on classroom student engagement rates was not examined.

Problem Statement

Now that research findings have accumulated into bodies of fairly well-confirmed knowledge (Rosenshine & Stevens, 1986; Berliner, 1986), it seems crucial to move toward some "goodness of fit" model, where preservice teachers are trained to use more effective instructional behaviors. The pivotal question involves how to increase preservice and inservice teachers' levels of appropriate instruction and corresponding student engagement. The answer to this question would avoid what Feiman-Nemser and Buchmann (1983) call the "two-worlds pitfall," where the world of thought--university courses--is far removed from the world of action--school classrooms. Including research-based training and evaluation activities into teacher education programs could bridge the gap between these two worlds. At the same time, it would end the lament of many scholars (e.g., Lortie, 1975; Howsam et al., 1976) who have noted that teachers have no shared body of technical knowledge upon which to draw for structuring their instructional program.

Assuming that changes in teaching behavior are critical to the improvement of teaching, which ultimately will impinge upon student achievement, one finds suprisingly little systematic inquiry into the process of teacher training (Sparks, 1986). Few studies in the teacher education literature have been conducted on methods for training preservice teachers to use research-based instructional behaviors. No studies were found which examined the effect of these research-based behaviors on student engagement rates. It is critical that prospective teachers not only are made aware of effective teaching techniques, but that they be allowed to develop their ability to apply these behaviors in classroom settings and to objectively examine their effect on student engagement. This study was therefore undertaken to investigate variables which affect teacher trainees' acquisition of effective teaching skills. Specifically, it addressed the following questions:

If preservice teachers are taught effective teaching skills, expected to use them when teaching, and provided feedback on the use of these skills, (a) will they demonstrate increased use of these skills in actual teaching situations, and (b) do changes in use of these skills increase student behaviors associated with higher achievement levels?

Hypotheses

The specific hypotheses investigated in this study were:

1. There will be no significant difference between Groups A and B in observed levels of various teacher behaviors during the baseline phase.
2. There will be no significant difference between Groups A and B in observed levels of student engagement during the baseline phase.

3. Information regarding effective teaching practices and computer-generated feedback will result in statistically significant differences between the groups in favor of Group A for active teacher instruction during the first intervention phase.

4. Information regarding effective teaching practices and computer-generated feedback will result in statistically significant differences between the groups in favor of Group A for student engagement levels during the first intervention phase.

There will be no significant difference between Group A and Group B in observed levels of active instruction and student engagement during the second intervention phase--Group B means on these variables will match those of Group A during this period.

6. Group A will show a statistically significant increase over their baseline level in the categories of active instruction and student engagement following the first intervention phase.

7. There will be a significant increase in Group B's active teacher instruction and student engagement mean from baseline to the second intervention phase.

8. Student ratings on the computer checklist items will improve as a result of training.

9. There will be a statistically significant difference between the groups in favor of Group A regarding

attitudes toward the microcomputer-based observation system following the first training session. Differences between the groups will be nonsignificant after the second training session.

these students.

This study was conducted during the fall and spring semesters, during which time the students participated in three different field experiences. In the first semester, there were two different six-week placements in the Monroe County Community School Corporation. Students were placed in a variety of settings, including preschool through high school self-contained classrooms, or multicategorical resource rooms with Mildly Mentally Handicapped, Emotionally Handicapped, Moderately Mentally Handicapped, Learning Disabled, and Multiply Handicapped children. During the second semester, students travelled to the Indianapolis Public School System for an eight-week practicum in order to experience a more urban school environment. In each of these placements, students were expected to assist the teacher with regular classroom duties, some of which included: preparing lessons, teaching individual students, small groups of students or the entire class, grading papers, monitoring individual seat work, or assisting with recess and special events.

Students were supervised at least three times in each placement, for a minimum of nine observations per student. All observations were conducted by graduate students in special education. The observers scheduled all observations in advance and made the schedules available to the supervising teachers and students.

Thus, students knew when they would be observed, and tried to arrange with their supervising teacher to be conducting a lesson during that time.

Assignment to Condition

The participants in this study were randomly assigned to two groups. Since differential training was to be provided to each group, the students were divided on the basis of a pre-existing condition: enrollment in two sections of a reading methods course. The students had been assigned to the different sections on a random basis. Thus, groups were equitably divided according to ability. The students were never informed of their status in the study, and the observers also were blind to condition.

Observers

Several graduate students were recruited to observe the undergraduates. Criteria for selection of these individuals included prior teaching experience as well as a personal interview with the field-experience instructor. Observers generally worked 10 to 20 hours per week and were responsible for supervising 10 to 15 students each semester. During the course of the study, three individuals conducted the student observations.

Observation System

The Special Teacher Education and Evaluation Laboratory (STEEL) observation system was used in this study. The observation system is comprised of five major categories: Group Structure, Educational Activity, Teacher Instructional Behaviors, Student(s) Behaviors (Target Group), and Student(s) Behavior (Monitored Group). Each major category contained five or more subcategories for coding purposes, all of which were operationally defined. The category of group structure described the focus of the observed teacher's attention in relation to student group arrangement. Subcategories included (a) whole group, (b) partial group, (c) individual responsibility, (d) partial group with additional monitoring, and (e) individual responsibilty with additional monitoring. This category recognized that differences in group structure call for different instructional and group management techniques. Conversely, differences in instructional intent may call for different grouping arrangements. Thus, evaluation of teaching techniques necessitated identifying the classroom structure.

The second major observational category described the educational activity occurring in the classroom. Subcategories included both active and passive instruction and transition/procedural. The third category was teacher instructional behavior, which focused on those activities of the observed teacher which were directly related to the delivery of instructional content. There were eight teacher instructional behaviors, including (a) preparation/administrative duties, (b) observational monitoring, (c) structuring/

directing, (d) explanation/questioning-planned, (e) explanation/questioning-need, (f) evaluative feedback, (g) task engagement feedback, and (h) behavioral feedback.

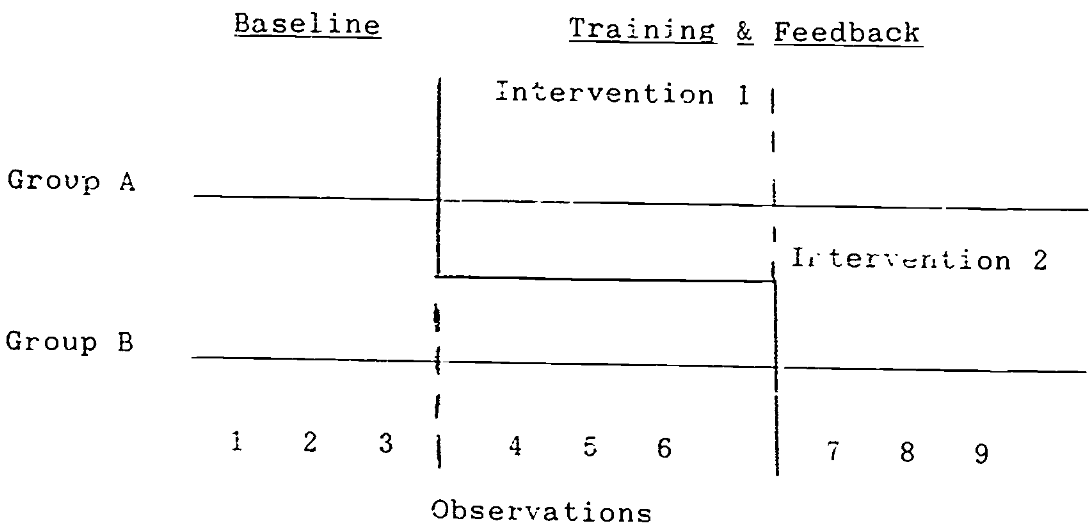
The final two categories of the observation system measured classroom student behavior in both the target and (if applicable) monitored groups. These classifications were used to describe the task-related behavior of those students, whether an individual, partial group, or whole group, who were the target instructional focus of the observed teacher. If the teacher was responsible for monitoring other students, the student behavior (monitored group) category was used. Within these categories, student behavior could be coded either (a) engaged-active, (b) engaged-passive, (c) non-engaged-active, or (d) non-engaged-passive.

Finally, within each of the five observational categories, the observers were provided with two additional choices. Null was coded if a given classification was not relevant to the observed situation, e.g., if the teacher trainee was not responsible for any portion of the class; Can't Tell indicated that the observer was not able to immediately determine the appropriate classification category. These codes were altered as soon as the situation changed. Finally, the system had a real-time error prevention feature in which codes not recognized by the software were not permitted, ensuring accurate coding categories.

This feature is an important consideration when recording absolute behavioral frequencies in a natural environment (Skrtic & Sepler, 1982).

<u>Research Design</u>

The research design is shown in Figure 2 and described below:



<u>Figure 2. Research Design</u>

<u>Baseline</u>. The baseline phase covered a period of six weeks, during which students were observed three times each. After each observation, the observers discussed the lesson with the teacher trainee and gave them a copy of their field notes. Field notes were written on a standard observation form which consisted of a blank piece of paper with the student's name, current date, class period and other identifying information at the top. This form was carbonless, and produced three copies of the field notes--one of which was given to the

classroom teacher and one to the field experience student, while the final copy remained with the observer. The suggested procedure for filling out this form was a brief anecdotal record and critique of what occurred while the observer was present in the classroom (see Appendix A). Student strengths were noted with a plus (+), and weaknesses with a minus (-) sign. This was the only form of feedback provided to all students during the baseline phase of the study.

Intervention 1: Group A ALT Training. Following the baseline phase, students in both groups were given a three-hour training session involving different content. Each training session was conducted by the investigator. Students in Group A received a review of recent research studies which have demonstrated that certain teacher behaviors produce increased student academic gains. The concept of Academic Learning Time (ALT) was emphasized, and studies were reported which have supported the efficacy of such teacher behaviors as active instruction, reduction of transition time, and maintaining a high level of student engagement.

Effective ALT teaching strate ies were then explained to Group A students in relation to the various observational categories on the STEEL observation system, previously discussed. Student questions concerning the research literature were clarified and overall skill improvement strategies were suggested. For example, students were advised to try to increase their use of active instruction and student engagement rates, and to try to decrease passive instruction, transition time, and student non-engagement. Anonymous examples were provided students using data from observations conducted on previous participants in the mildly handicapped program: the interrelationships between various types of teacher behavior and its subsequent effect on classroom student behavior were noted. An example of this type of training material is provided in Appendix B.

One week later, prior to field observations, Group B students were also given a three-hour training session in "humanistic classroom management." This topic was selected because it had an appropiate degree of face validity, yet was sufficiently distinct from the research-based training information. A series of videotaped vignettes were shown to the students. The investigator stopped the tape at appropriate points to discuss the information and to assess student mastery of concepts presented on the tape. No mention was made of the ALT literature, the microcomputer-based observation system, or of the field observation procedures.

Following these training sessions, each group of students participated in a six-week field placement. The observers provided computer-generated printouts and feedback as well as field note feedback to Group A. Group B received only field notes. Providing Group A with field notes in addition to the computer feedback was deemed necessary by the field experience instructor, who felt it important to maintain a degree of normalcy for the students. Observers were blind to condition; differential feedback was based upon a list of student identification numbers.

Intervention 2: Group B ALT Training. Prior to the second intervention phase, an additional training session was held. In this session, students in Group B were given training identical to that received by Group A students in the fall. Group A students were not given any additional training, but rather received individual printouts of their aggregated classroom teaching performance during the baseline and first intervention phases. Improvements in individual percentage scores in the areas of active and passive instruction and transition time as well as student engagement were noted. The investigator encouraged students in Group A to maintain or, if necessary, improve specific teaching behaviors during the second intervention phase.

Computer Data Collection Procedures

Instrument. The STEEL observa on system was used to collect data for this study. This observation system was microcomputer-based, i.e., resident in an Epson HX-20 microcomputer, and utilized a real-time coding system which allowed electronic recording and data analysis of teacher trainee behavior in classroom settings. Behaviors were coded as the teacher trainee conducted a lesson, then computer printouts showing actual amounts of time spent on various activities were provided as feedback, a technique identified as being a more effective evaluation strategy (Medley, Coker, & Soar, 1984).

Classroom Observations. When the observers first entered a classroom, they moved quietly to a position where they could clearly observe the teacher trainee and avoid distracting the class. Once situated, the observer turned on the computer and selected one of the five programmable function keys. Function 2 ("COLLECT") engaged a software program which prompted the observer to enter "header" information, including (a) the date, (b) their observer number, and (c) the identification number of the student whom they were observing. After this information was entered, the computer prompted the observer to select the most appropriate beginning code for each observational category.

For the observers' benefit, an abbreviated list of codes and checklist items was located on the left side of the computer. The observer first selected the appropriate group structure code which identified the portion of students in the class for whom the teacher trainee was responsible. If they were responsible for only a small group, the computer next prompted them to enter the number of students in that partial group. If the teacher trainee was instructing a small group but was also responsible for monitoring other students, the observer was prompted to indicate the size of the monitored group. Next, they entered a code identifying the educational activity, i.e., "active instruction", "passive instruction", "transition", or "can't tell". Fourth, the teacher instructional behavior was recorded. Finally, observers recorded the student behavior, both in the target and monitored (if applicable) groups. These "start up" codes had to be entered before further coding could occur. After this initial coding was completed, codes were changed as either teacher, i.e., field experience student or classroom student behavior changed.

Using real-time observation coding procedures, observers coded the actual duration of each behavior in terms of seconds. While a code from a particular behavior category was in effect, time was incremented in that category by the computer's internal clock. This condition remained in effect until observers entered a new behavior code in that category. When a code was changed, time began to be incremented in the new behavior category. This procedure was followed for each observable teacher and/or student behavior until the observation session was completed. To end the session, observers entered a "00" code, which turned off the computer's internal clock. Then, the observer was given an option to actually halt or to resume coding. If the observer indicated that they did not wish to resume coding, i.e., the observational period was complete, they pressed the "N" (No) key.

At this point, the computer prompted observers to proceed to the checklist ratings by selecting Function 3 ("CHECKLIST"). The observer was prompted to rate a student's performance on any of a total of 68 checklist items. When the observer selected a given item number, it was displayed on the computer screen along with the rating scale, and the observer entered the appropriate value, whether 1 (Low), 2 (Medium), or 3 (High). When the entire observation was finished, the observer selected Function 4 ("REPORT"). This produced a printed report of the aggregated category totals, expressed both as a percentage of total observation time and actual minutes. Observers then shared and discussed the observation results with the teacher trainee (see Appendix C).

All observational data were aggregated in the computer's internal memory. It remained there until the observer selected Function 5 ("SAVE"), which moved the observation data from internal memory and stored them on a microcassette tape, also included in the Epson HX-20. With the observational data saved on cassette, the computer was ready for the next observation. When the microcassette tapes were full, the data were transferred to the student's larger database located on a mainframe computer.

Observer Training

Laboratory training. Each observer participated in a day-long training program provided by the investigator regarding the computer observation system in addition to a general 20 to 30 hour orientation in supervisory techniques provided by the field experience instructor. At the beginning of the 1985-86 academic year, an eight-hour training session was held with the three supervisor/observers. Training included a general presentation and discussion of (a) the ALT research literature and how it related to the STEEL project, (b) the STEEL classifications, categories, and checklist items, (c) the STEEL observation system and, (d) the use of the Epson HX-20 portable microcomputer.

After thoroughly discussing the observation system and behavioral categories, the supervisors practiced coding videotaped segments of classroom interactions. The observers coded three different classroom vignettes demonstrating behaviors included in the observation system. Interobserver agreement information was taken for each of these coding sessions and used as feedback to observers to consensually validate the observation categories. Reliability was estimated using the Flanders reliability coefficient formula (Flanders, 1967). This formula was selected because it is a more appropriate reliability coefficient for situations in which the intended unit of analysis is category proportions (Frick & Semmel, 1978). Reliability coefficients ranged from

.86 to .91. Since an interobserver agreement coefficient of .75 is generally considered acceptable (Johnson & Bolstad, 1973), observers were judged to be coding the videotapes reliably, and training was concluded.

Field calibration. Interobserver agreement checks were conducted five times throughout the course of the study. The investigator would meet with individual observers in field classrooms and serve as the criterion coder. Observers were instructed to emphasize accuracy rather than interobserver agreement (Boykin & Nelson, 1981).

Observer 12 was visited by the investigator twice during the month of November. The first observer agreement check yielded a Flanders coefficient of .73. The criterion observer (investigator) and Observer 12 discussed discrepancies between observation results and problematic behavioral codes were clarified. A second field check conducted with this individual two days later obtained an interobserver agreement rating of .85, which was judged acceptable.

Observer 14 also underwent a field reliability calibration with the investigator. Because some initial field data generated by Observer 14 was questionable, i.e., the codes generated in one category did not agree with other observational codes, it was discarded and an additional two hours of laboratory training was provided. Following this training, Observer 14 produced an initial field agreement check of .80, and a second check, conducted the following week, of .94. At this time, the data generated by Observer 14 was judged to be reliable and was subsequently included in the database.

Observer 13 was visited once in the schools during the first semester. This individual had achieved the highest interobserver agreement ratings during the laboratory training period. As Observer 13 obtained a Flanders coefficient of .98 on the first field check, no further field calibrations were performed.

To ensure that there was no observer drift over the Christmas break, field observer agreement data was again collected in January of 1986. Interobserver agreement scores of .88 (Observer 14), .95 (Observer 12), and .97 (Observer 13) were obtained. As these checks far exceeded acceptable levels of agreement (Johnson & Bolstad, 1973), no further field calibrations were conducted after this time.

Attitude Scale

A twenty-four item attitude scale, the Student Evaluation of Observation System (SEOS), was developed specifically for the study. Items were written by the investigator and submitted to two knowledgable external reviewers for content validation. Items on the scale asked students to rate the usefulness and clarity of both types of feedback, the quality of explanations, and the degree of threat presented by both types of evaluative feedback (see Appendix D).

The SEOS was administered to determine whether there were differences in the attitudes of the two groups (A and B) regarding the two types of observational feedback as a result of the differential training. The scale was administered twice to students involved in the study. The first administration occurred at the end of the first intervention phase. At this time, Group A students had received the ALT training/computer feedback for three observations while Group B students had received only field notes. Responses to the scale were ostensibly anonymous, but students were tagged according to which section of the reading methods course they were enrolled in to determine their status in the study. Students were asked to rate 18 items on the attitude scale relating to both the computer and field note feedback systems on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree). Six open-ended questions were also included, asking for student reactions to both forms of feedback.

The attitude scale was administered for the second time at the end of the second intervention phase. At this time, all students had been given the ALT training. Group B students had received computer-based feedback for three observations, Group A students for six observations Students responded to the same items, and responses were once again collected anonymously. This enabled an analysis of student attitude change toward he microcomputer-based observation system as a function of the information presented at the second training session.

Data Analysis

Analysis of the observational data was conducted in the following manner: within each phase of the study, individual students' percentages of observed time in the categories of active and passive instruction, transition, and active and passive classroom student engagement were aggregated for each phase of the study. Then, these totals were divided by the number of times the student was observed during that phase, thus providing a mean percentage rate for each student. This was necessary because observation periods varied in length, so comparing students by observations alone would not provide an accurate measure. The final step involved combining the individual student means and dividing that total by the number of students in each group, i.e., A or B. In this manner, group means were obtained for each condition in the study. These means were then compared using T-tests in order to evaluate the difference between the groups as a result of training effects. The probability level for type-I errors was set at .05. Using this procedure, main effects between the groups in the categories of active and passive instruction and transition as well as concomitant classroom student on-task behavior over all phases of the study (Baseline - Intervention 1 - Intervention 2) were examined.

All mean scores were rounded to the nearest hundred. Percentages did not always equal 100 per cent because incidental amounts of observation time were coded in the categories of Null (no instruction occurring in the classroom) and Can't Tell (observer unable to immediately ascertain teacher trainee/classroom student behavior). First, a between groups comparison was performed, where the performance of Group A was compared with the performance of Group B for each phase of the study, resulting in three separate comparisons (Baseline - Intervention 1 - Intervention 2). Then, each group was examined individually using a repeated measures design to determine the degree of change which occurred within groups over the phases of the study, resulting in two major comparisons for each group. For Group A, significant changes were expected to be observed between the Baseline and Intervention 1 phases. To examine whether any observed changes were maintained over time, the Intervention 1 mean score was then compared with the Intervention 2 mean. For Group B, the Baseline - Intervention 1 comparison was not expected to be significant, while the Intervention 1 - Intervention 2 as well as the Baseline - Intervention 2 comparisons should show significant differences.

Attitude scale data were analyzed using the Kolmogorov-Smirnov Two-Sample Test (Siegel, 1956). This nonparametric test was selected because the attitude scale utilized a 5-point rating system on which students rated responses from 1 (Strongly Agree) to 5 (Strongly

Disagree). Since this rating system involved an ordinal scale, it was necessary to examine the data using a statistical procedure which makes only minimal assumptions about the form of the underlying distributions of the data. The Kolmogorov-Smirnov Two-Sample Test measures the homogeneity of the distribution. It allows one to determine whether the attitudes of one group were significantly different from those of the second group. Examining the attitude scale data in this manner was intended to identify differences in student attitudes which occurred as a result of the differential training provided. Additionally, student responses to the open-ended questions were examined using naturalistic methodology (Guba & Lincoln, 1981).

RESULTS

From the data yielded by the microcomputer-based observation instrument, three teacher and two pupil behaviors were selected as dependent variables: (a) the teacher trainees' levels of time spent in active instruction, passive instruction, and in transition, and (b) classroom pupils' active and passive engagement rates.

Other dependent variables examined in this study include student ratings on 20 computer checklist items measuring general academic and behavior management strategies which were evaluated on a three-point scale, and student responses to 18 attitude scale items which were measured on a five-point scale.

Between Groups Analyses

Observational Data: Baseline Phase

Effects of the differential training on three teacher behavior and two student engagement variables were examined by comparing the two groups' performance by phase. These comparisons are shown in Tables 2 and 3.

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Insert Tables 2 and 3 about here

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Teacher trainee instructional behaviors. In the category of active instruction, Group A produced a mean of 66 per cent during the baseline period, while students in Group B had a mean of 60 per cent. The *t*-test results indicated no significant differences between the groups regarding their use of active instructional behaviors

Table 2

Group Means and Standard Deviations for Dependent Variables By Phase

Variable by Group	Baseline		Int. 1		Int. 2	
	M	SD	M	SD	M	SD
Active Instruction						
A	66.7	23.9	94.7	5.2	86.5	11.8
B	59.8	27.6	69.8	25.2	94.5	7.9
Passive Instruction						
A	23.5	24.3	3.0	4.3	7.1	10.0
B	25.5	17.7	19.9	22.1	4.5	7.7
Transition						
A	5.3	4.9	1.2	1.7	4.3	4.1
B	12.1	15.8	8.9	8.9	.88	1.3
Active Student Engagement						
A	59.1	22.8	81.4	15.5	69.1	13.7
B	53.4	25.7	70.6	14.2	64.0	15.8
Passive Student Engagement						
A	24.0	24.7	11.8	13.4	22.8	11.2
B	34.5	28.6	19.9	10.9	27.8	14.8

Table 3

Between Groups t-Values for Dependent Variables By Phase

(separate variance estimates are reported)

Variables by Phase	df	*t*
Baseline		
Active Instruction	24.89	.60
Passive Instruction	21.85	-.24
Transition	15.63	-1.52
Active Student Engagement	24.95	.61
Passive Student Engagement	24.88	-1.02
Intervention 1		
Active Instruction	14.18	3.61 **
Passive Instruction	14.08	-2.80 **
Transition	13.98	-3.20 **
Active Student Engagement	24.37	1.89
Passive Student Engagement	23.14	-1.73
Intervention 2		
Active Instruction	20.88	-2.05
Passive Instruction	22.51	.75
Transition	14.16	2.87 **
Active Student Engagement	24.90	.89
Passive Student Engagement	24.02	-.99

$^{*}p<.05$. $^{**}p<.01$.

during this phase. For the three observations sessions comprising the baseline phase, Group A had a mean of 24 per cent and Group B an average of 26 per cent in the category of passive instruction. The t-test comparison revealed no significant differences between the groups in their use of this instructional strategy during the baseline phase.

In the transition category, Group A spent a mean of 5 per cent of available time on transitional activities during baseline, while Group B averaged 12 per cent. Although the observed means of the groups were more discrepant regarding time spent in transitional activities, the difference did not reach a statistically significant level.

<u>Classroom</u> <u>student</u> <u>behavior</u>. The data indicate that, during baseline, Group A maintained a mean of 59 per cent active student engagement, while Group B had a mean of 53 per cent. No significant difference was observed between the groups. During this same phase, Group A had an observed mean of 24 per cent in the category of passive instruction, while students in Group B maintained an average of 35 per cent in the same category, again nonsignificant.

Thus, the first hypothesis, that no significant differences would be observed between the groups in the amounts of time devoted to active instruction, passive instruction, and transitional activities during the baseline phase, was accepted. Likewise, the second hypothesis, that there would be no significant differences between the groups in observed levels of student engagement during the baseline phase was also accepted.

Observational Data: Intervention 1

Teacher trainee instructional behaviors. During this phase of the study, the mean in the category of active instruction for teacher trainees in Group A increased to 95 per cent, while Group B trainees increased the mean percentage of active instruction to 70 per cent. A highly significant difference ($p < .002$) was observed between the groups regarding their use of active teaching behaviors during this phase. In the category of passive instruction, Group A had an observed mean of three per cent, while Group B had a mean of 20 per cent. Again, a significant difference ($p < .012$) was observed between the groups.

The amount of available time spent in transitional activities by students in Group A was reduced to one per cent during the first intervention phase, while Group B maintained an average of nine per cent. Thus, students in Group A spent significantly less time ($p < .005$) in transitional activities than students in Group B during the first intervention phase.

Classroom student behavior. The mean active student engagement percentage score for teacher trainees in Group A during the first intervention phase was 81 per cent, while Group B had an observed mean of 71 per cent. While differences between the groups in this category approached significance ($p < .07$), it did not meet the predetermined level of .05.

Students in Group A had an observed mean of 12 per cent in the category of passive student engagement. During the same time, students in Group B maintained a mean of 20 per cent. Again, differences between the groups in this category approached ($p < .09$), but did not reach significance.

The third hypothesis, that the information regarding effective teaching practices in combination with the computer-generated feedback would result in statistically significant differences between the groups in favor of Group A for active teacher instruction during the first intervention phase was supported. The fourth hypothesis, that the ALT training/feedback would significantly affect student engagement means in favor of Group A during the first intervention phase was rejected. As noted, differences between the observed mean student engagement scores for groups A and B approached, but did not meet, the predetermined level of statistical significance.

Observational Data: Intervention 2

Teacher trainee instructional behaviors. During this phase of the study, students in both groups were again observed three times. Students in Group A obtained an average of 87 per cent active instruction while Group

B students increased their mean in this category to 95 per cent. Thus, the groups became more similar in their observ se of active instructional behaviors following the second training, and no significant differences were observed.

In the category of passive instruction, students in Group B reduced their observed mean to five per cent during the second intervention phase, while students in Group A obtained an average mean score of seven per cent. Again, this indicates that the groups became more similar in their use of this instructional strategy, with no significant differences observed.

Group B students reduced their mean percentage score in the category of transition to approximately one per cent while Group A had an observed mean of four per cent This discrepancy between group means for the category of transition resulted in a significant difference between the two groups during this phase of the study.

<u>Classroom student behavior</u>. The observed active student engagement means of both groups were highly similar during the second intervention phase. Group B students had a mean of 64 per cent active student engagement, while Group A had a mean of 69 per cent, a nonsignificant difference.

In the category of passive student engagement, the groups were again more homogeneous. Group B had a mean of 28 per cent, while Group A had an observed mean of 23 per cent. No significant differences were observed between the groups in their levels of passive student engagement during the second intervention phase.

Based upon the above results, the fifth hypothesis, that there would be no significant differences between the groups in the categories of active instruction and student engagement during the second intervention phase was accepted. However, the significant difference observed between the groups in the category of transition tempers the acceptance.

Checklist Item Data

Twenty checklist items were selected and used to examine the effects of differential training/feedback on teacher trainee performance. These items were chosen because they were judged to have the strongest relationship with the concept of ALT. Items were rated by the observers on a three point scale, with 1=Low, 2=Medium, and 3=High. Group means and standard deviations are listed in Table 4 for each of the three phases of the study. Table 5 shows the between groups comparisons by phase, with statistically significant changes noted.

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Insert Tables 4 and 5 about here

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The results demonstrate that, while both groups showed improvement on their checklist ratings over the course of the study, few significant differences between

Table 4

Between Groups Means and Standard Deviations on Checklist Items by Phase

Checklist Item	Group	Baseline		Int. 1		Int. 2	
		M	SD	M	SD	M	SD
01	A	1.7	.52	2.3	.71	2.7	.47
	B	1.4	.59	1.6	.52	3.0	0
02	A	1.9	.39	2.8	.42	2.8	.44
	B	2.0	.71	2.1	.33	2.9	.33
03	A	2.6	.52	3.0	0	2.9	.33
	B	2.4	.52	2.7	.48	2.8	.45
04	A	2.5	.67	2.9	.29	3.0	0
	B	2.5	.69	3.0	0	2.9	.33
05	A	2.4	.67	3.0	0	3.0	0
	B	2.5	.69	2.6	.53	2.9	.33
06	A	2.5	.53	3.0	0	3.0	0
	B	2.8	.44	2.6	.53	3.0	0
07	A	2.7	.48	3.0	0	3.0	0
	B	2.8	.44	2.9	.33	2.9	.33
08	A	2.4	.53	2.9	.33	3.0	0
	B	2.6	.52	2.7	.50	3.0	0

(table continues)

Table 4

Between Groups Means and Standard Deviations on Checklist Items by Phase

Checklist Item	Group	Baseline M	Baseline SD	Int. 1 M	Int. 1 SD	Int. 2 M	Int. 2 SD
09	A	2.5	.52	3.0	0	3.0	0
	B	2.5	.69	2.7	.50	2.7	.50
14	A	2.4	.67	2.7	.68	2.9	.32
	B	2.5	.78	2.8	.42	3.0	0
19	A	2.2	.58	2.9	.29	2.9	.33
	B	2.6	.67	2.6	.52	3.0	0
20	A	2.3	.49	2.9	.35	3.0	0
	B	2.6	.79	3.0	0	3.0	0
22	A	2.4	.51	2.9	.29	3.0	0
	B	2.6	.65	2.9	.38	2.9	.38
30	A	2.3	.46	2.9	.35	3.0	0
	B	2.6	.51	2.9	.39	3.0	0
50	A	2.1	.99	2.8	.41	2.8	.39
	B	2.2	1.0	2.5	.82	2.6	.52
51	A	2.2	.79	2.6	.52	2.6	.74
	B	2.4	.79	2.3	.71	3.0	0

(*table continues*)

Table 4

Between Groups Means and Standard Deviations on Checklist Items by Phase

Checklist Item	Group	Baseline M	Baseline SD	Int. 1 M	Int. 1 SD	Int. 2 M	Int. 2 SD
56	A	1.7	.76	2.7	.49	3.0	0
	B	2.2	.83	2.8	.46	2.8	.50
90	A	2.4	.67	2.6	.70	3.0	0
	B	2.5	.66	2.8	.68	2.8	.46
92	A	2.1	.74	3.0	0	3.0	0
	B	2.4	.52	2.7	.49	2.8	.45
95	A	2.3	.50	3.0	0	3.0	0
	B	2.8	.45	3.0	0	2.8	.45

Note.

01 Conveyance of importance of curriculum content

02 Conveyance of importance of pupil performance

03 Use of transition time

04 Degree of task-orientation

05 Organization of time

06 Organization of presentation

07 Organization of materials

08 Sequencing of instruction

09 Pacing of instruction

14 Clarity of directions

19 Provision of feedback about pupil performance

20 Provision for basic skill acquisition

22 Provision for successful experience

30 Educational relevance/soundness of instruction

50 Awareness of classroom dynamics

51 Clarification of behavioral expectations

56 Consistency in use of behavior management techniques

90 Degree of student task-orientation

92 Level of group participation

95 Degree of student task success

the groups were observed. During the baseline phase, the groups were highly homogeneous regarding their checklist ratings.

During the first intervention phase, the groups received significantly different ratings on only four items. One item reached significance during the second intervention phase. The higher ratings on these items were received following the ALT training sessions. These improvements were observed even though the rating scale had a very limited range (1 to 3) and was thus fairly insensitive to change. These results must be viewed tentatively, but are suggestive of improved teacher performance as a result of the ALT training.

Table 5

Between Groups t-Values for Checklist Items by Phase

Period	Checklist Item	df	t
Baseline	01	1,10	.83
	02	1,15	-.48
	03	1,17	.92
	04	1,22	-.16
	05	1,21	-.63
	06	1,18	-1.24
	07	1,22	-.36
	08	1,18	-.65
	09	1,21	0
	14	1,22	-.33
	19	1,31	-1.63
	20	1,18	-.82
	22	1,23	-1.04
	30	1,17	-1.70
	50	1,22	-.31
	51	1,21	-.64
	56	1,15	-1.26
	90	1,24	-.17
	92	1,17	-.89
	95	1,20	-2.00

(table continues)

Table 5

Between Groups t-Values for Checklist Items by Phase

Period	Checklist Item	df	t
Int. 1	01	1,17	2.33 *
	02	1,18	3.92 ***
	03	1,18	1.86
	04	1,21	-.91
	05	1,16	2.38 *
	06	1,16	2.38 *
	07	1,15	.87
	08	1,18	1.11
	09	1,17	1.88
	14	1,19	-.40
	19	1,21	1.82
	20	1,14	-.93
	22	1,18	.39
	30	1,14	.09
	50	1,20	1.32
	51	1,17	1.22
	56	1,14	-.15
	90	1,18	-.57
	92	1,13	1.55
	95	1,15	0

(table continues)

Table 5

Between Groups t-Values for Checklist Items by Phase

Period	Checklist Item	df	t
Int. 2	01	1,20	-1.84
	02	1,21	-.69
	03	1,13	.42
	04	1,18	1.11
	05	1,18	1.06
	06	1,17	0
	07	1,18	1.06
	08	1,16	0
	09	1,18	2.22 *
	14	1,17	-.89
	19	1,17	-.94
	20	1,2	0
	22	1,14	1.07
	30	1,14	0
	50	1,21	1.21
	51	1,16	-1.52
	56	1,9	1.00
	90	1,17	1.72
	92	1,9	1.00
	95	1,12	1.30

*$p<.05$. **$p<.01$. ***$p<.001$.

Attitude Scale Data

Analysis of items measured on the Student Evaluation of Observation System attitude scale are shown in Tables 6, 7, and 8. To enhance the clarity of presentation, items were grouped into topical categories. Items pertaining to the field note feedback are presented first. Then, items pertaining to the microcomputer feedback system and finally, items relating to the computer checklist feedback are presented. Kolmogorov-Smirnov Z scores (Siegel, 1956) and associated 2-tailed probability levels are reported for each group of items. It should be noted that the items from each of the categories were interspersed on the original Student Evaluation of Observation System attitude scale (see Appendix D), so the numbers used in the following tables do not necessarily correspond with the original numbering system.

Table 6

Between Groups Comparison of Field Note Items

Item No.	Administration 1	Administration 2
1	$Z=1.23$, $p<.10$	$Z=.61$, $p<.85$
2	$Z=.82$, $p<.52$	$Z=.41$, $p<1.0$
3	$Z=.82$, $p<.52$	$Z=1.02$, $p<.25$
4	$Z=.41$, $p<1.0$	$Z=.20$, $p<1.0$
5	$Z=1.02$, $p<.25$	$Z=.20$, $p<1.0$

Note.

1. The supervisors were skillful in providing field note feedback.
2. The field note feedback was helpful in improving my teaching skills.
3. The field note feedback doesn't provide me with clear ideas of what things I need to do to improve my teaching.
4. I feel comfortable with the supervisors using the field note method to evaluate my teaching.
5. The field note feedback should be retained as part of the undergraduate field supervision program.

It can be seen that student attitudes toward the field note feedback did not change between the two attitude scale administrations. In other words, the differential training provided to the groups did not affect their generally positive attitudes toward this form of feedback. Comments made by the students supported this finding, and will be discussed later.

Table 7

Between Groups Comparison of Computer Observation Items

Item No.	Administration 1	Administration 2
1	Z= .20, p<1.0	Z=0, p<1.0
2	Z= .61, p<.85	Z=.20, p<1.0
3	Z=2.04, p<.000 ***	Z=.20, p<1.0
4	Z=1.84, p<.002 **	Z=.41, p<1.0
5	Z=1.43, p<.03 *	Z=.20, p<1.0
6	Z= .61, p<.85	Z=.41, p<1.0
7	Z=1.23, p<.10	Z=.41, p<1.0
8	Z=2.04, p<.000 **	Z=.20, p<1.0

Note.

1. The computer was always used during the observations.
2. I always received the computer summary from the observers.
3. The supervisors clearly explained the computer summaries of my teaching behaviors.
4. I clearly understand the various categories on the observation system.
5. The computer-based feedback was helpful in improving my teaching skills.
6. Being evaluated by the computer observation system is a threatening experience.

7. I feel comfortable with supervisors using the computer observation system to evaluate my teaching.
8. The computer observation feedback should be retained as part of the undergraduate field supervision program.

The groups showed significant differences on four of the eight attitude scale items involving the microcomputer-based observation system on the first attitude scale administration. These items were intended to measure the teacher trainees' professed level of understanding of the computer-based feedback and whether or not they perceived it as beneficial. Results indicate that there were clear differences in favor of Group A regarding both the value and usefulness of this type of performance feedback.

Thus, the first half of hypothesis number nine, that there would be a statistically significant difference between the groups in favor of Group A regarding attitudes toward the microcomputer-based observation system following the first training session, was accepted.

Table 8

Between Groups Comparison of Checklist Items

Item No.	Administration 1	Administration 2
1	$Z=1.84$, $p<.002$ **	$Z=.20$, $p<1.0$
2	$Z=.82$, $p<.52$	$Z=.41$, $p<1.0$
3	$Z=2.04$, $p<.000$ **	$Z=.41$, $p<1.0$
4	$Z=1.43$, $p<.03$ *	$Z=.41$, $p<1.0$.

Note.

1. The supervisors were skillful in explaining the checklist feedback.
2. The checklist feedback (High-Medium-Low) was helpful in improving my teaching skills.
3. I feel the checklist feedback system too confusing to be useful.
4. The checklist feedback system should be retained as part of the undergraduate field supervision program.

After the first attitude scale administration, the groups displayed significantly different attitudes toward the majority of statements relating to the checklist items. On the second administration, i.e., after both groups had received the ALT training, these differences disappeared. Thus, the second half of hypothesis number nine, that differences between the groups would be nonsignificant following the second ALT training, was also accepted.

Within Group Analyses

The effect of the differential training/feedback upon the performance of individual groups over the three phases of the study was also evaluated. Differences in individual group means and standard deviations on dependent variables can be examined in Table 2. To gain further insight into the effects of the ALT training and feedback procedures, a repeated measures _t_-test design was employed to examine intragroup performance change and, where appropriate, maintenance across phases. The results are summarized in Tables 9 and 10. First, changes in Group A will be examined.

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Insert Table 9 about here

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Observational Data: Group A. Students in this group were expected to increase their level of active instruction during the first intervention phase. Their group mean increased from 66 per cent during baseline to °5 per cent during the first intervention phase, a highly statistically significant ($p < .001$) change.

Because this change in the use of active instructional behaviors was so robust, the first part of hypothesis number six, that students in Group A would show a statistically significant difference over their baseline level in the category of active instruction was supported.

Table 9

Within Group t-Values for Training Effects: Group A

Variables by Comparison Period	df	t
Baseline to Intervention 1		
Active Instruction	12	-4.11 ***
Passive Instruction	12	3.04 **
Transition	12	3.06 **
Active Student Engagement	12	-2.57 *
Passive Student Engagement	12	1.56
Intervention 1 to Intervention 2		
Active Instruction	12	2.06
Passive Instruction	12	-1.36
Transition	12	-2.84 *
Active Student Engagement	12	1.84
Passive Student Engagement	12	-1.65

*$p < .05$. **$p < .01$. ***$p < .001$.

During the second intervention phase, the observed level of active instruction for Group A decreased slightly from the first intervention phase level, from 95 to 87 per ce t. This decrease was not significant, indicating that students in Group A maintained their active instruction gains over time.

Group A began the study with an average baseline mean of 24 per cent in the category of passive instruction. This decreased to three per cent following the first intervention, a significant ($p < .01$) decrease in their use of this instructional strategy. The group mean increased during the second intervention phase to seven per cent, a nonsignificant change. Again, this indicates that students in Group A maintained their more effective teaching strategies during this phase of the study.

In the category of transition, Group A had an average level of five per cent during baseline, indicating that they spent relatively little time in transitional activities. However, this level decreased to one per cent following the first intervention phase, a statistically significant ($p < .01$) reduction. During the second intervention phase, their observed level increased to four per cent. Thus, the amount of time that students in Group A allocated to transitional activities during the second intervention phase approached baseline levels, i.e., the reduced transition levels were not maintained over time.

In the category of active student engagement, the mean percentage score of Group A students increased from 59 to 81 per cent during the first intervention phase, a significant ($p < .02$) change. Thus, the second part of hypothesis number six, that students in Group A would show a significant increase over their baseline level of student engagement during the first intervention phase was accepted. In the second intervention phase, this mean decreased to 69 per cent, a nonsignificant change, while the observed passive engagement mean increased.

Group A had an observed baseline level of 24 per cent in the category of passive student engagement. During the first intervention phase, this level decreased to 12 per cent, a nonsignificant change. Between the first and second intervention phases, the mean group percentage in this category returned to baseline levels, or 23 per cent, again a nonsignificant change.

<u>Observational Data:</u> <u>Group B</u>. The within group *t*-test values for Group B are shown in Table 10. Examining the observation data from baseline to the

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Insert Table 10 about here

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first intervention phase in the category of active instruction showed that students in Group B increased their mean from 60 to 70 per cent. This increase in

Table 10

Within Group t-Values for Training Effects: Group B

Variables by Comparison Period	df	t
Baseline to		
Intervention 1		
Active Instruction	13	-1.01
Passive Instruction	13	.83
Transition	13	.60
Active Student Engagement	13	-2.16 *
Passive Student Engagement	13	1.70
Intervention 1		
to Intervention 2		
Active Instruction	13	-3.93 **
Passive Instruction	13	2.76 **
Transition	13	3.50 **
Active Student Engagement	13	1.00
Passive Student Engagement	13	1.21

*$p < .05$. **$p < .01$.

the use of active instruction did not reach a statistically significant level.

After Group B received the ALT training/feedback, i.e., in the second intervention phase, a significant ($p < .002$) increase was observed. As previously noted, Group B had a 70 per cent active instruction level during the first intervention phase. In the second intervention phase, this increased to 95 per cent. This indicates that students in Group B used significantly more active instructional behaviors, and that this increase was due to some condition other than chance improvement or history. The first half of the seventh hypothesis, that there would be significant increase in the mean active instruction level of Group B during the second intervention phase, was accepted.

Students in Group B had an observed mean of 26 per cent in the category of passive instruction during baseline. This decreased to 20 per cent during the first intervention phase, a nonsignificant difference. After these students received the ALT training/ feedback however, their average use of passive instruction decreased to five per cent, a statistically significant ($p < .01$) change. not reaching the predetermined level of statistical significance.

Group B had an observed mean level of 12 per cent in the category of transition during the baseline phase. After the alternate training in humanistic classroom management, this decreased to 9 per cent, a nonsignificant change. Following ALT training, the observed group mean in this category was reduced to less than one per cent, a significant ($p < .001$) change. This indicates that, while these students were able to reduce their observed levels of transition as a result of other factors, i.e., experience, placement, or alternate training, it was not until they received the specific ALT training that a significant change in their use of this teaching strategy was observed.

Group B had a mean level of 53 per cent active student engagement in the baseline phase. During the first intervention phase, this increased to 71 per cent, a significant ($p < .05$) gain. In the second intervention phase, the observed level dropped to 64 per cent, a nonsignificant change. Thus, ALT training appeared to have little effect on the teacher trainees' observed levels of active student engagement, and the second half of hypothesis number seven, that the student engagement level for Group B would show a significant increase during the second intervention phase, was not supported.

Teacher trainees in Group B averaged 35 per cent in the category of passive student engagement during the baseline phase. This decreased to 20 per cent during the first intervention phase, a nonsignificant change. Following the ALT training, the observed mean in this category increased to 28 per cent, which also failed to reach the predetermined level of significance. Again, training appeared to have little effect on passive student engagement.

Checklist Item Data

Group means and standard deviations on the 20 checklist items can be examined in Table 4. The t-test results for determining change within groups across phases are presented in Tables 11 and 12.

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Insert Tables 11 and 12 about here

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These results indicate that Group A showed significant improvement on 15 items from baseline to the first intervention phase, while Group B improved significantly on only two items during the same time period. However, Group B showed significant improvement on five checklist items during the second intervention phase, while Group A students maintained their higher mean ratings. These results allow acceptance of the eighth hypothesis, that student ratings on the computer checklist items would show improvement as a result of training.

Table 11

Within Group t-Values for Checklist Items: Group A

Comparison Period	Checklist Item	df	t
Int. 1 to Int. 2	01	1,17	-1.50
	02	1,20	.17
	03	1,15	1.00
	04	1,20	-.96
	05	1,15	0
	06	1,14	0
	07	1,14	0
	08	1,15	-1.00
	09	1,16	0
	14	1,17	-.85
	19	1,18	.20
	20	1,7	-.48
	22	1,17	-.81
	30	1,13	-1.00
	50	1,20	-.09
	51	1,15	-.08
	56	1,8	-1.14
	90	1,17	-1.81
	92	1,9	0
	95	1,13	0

*$p<.05$. **$p<.01$. ***$p<.001$.

Table 12

Within Group t-Values for Checklist Items: Group B

Comparison Period	Checklist Item	df	*t*
Baseline to Int. 1	01	1,10	-.75
	02	1,15	-.43
	03	1,15	-1.37 *
	04	1,18	-2.09 *
	05	1,17	-.04
	06	1,15	.97
	07	1,19	-.69
	08	1,16	-.29
	09	1,17	-.44
	14	1,20	-1.24
	19	1,19	-.06
	20	1,11	-1.44
	22	1,17	-.90
	30	1.15	-.99
	50	1,21	-.59
	51	1,17	.48
	56	1,14	-1.58
	90	1,19	-1.10
	92	1,12	-1.30
	95	1,17	-1.55

(table continues)

Table 12

Within Group t-Values for Checklist Items: Group B

Comparison Period	Checklist Item	df	*t*
Int. 1 to Int. 2	01	1,15	-8.47 ***
	02	1,15	-4.95 ***
	03	1,12	-.39
	04	1,16	1.06
	05	1,15	-1.60
	06	1,15	-2.53 **
	07	1,15	0
	08	1,14	-1.88
	09	1,15	0
	14	1,15	-1.33
	19	1,15	-2.18 *
	20	1,5	0
	22	1,11	0
	30	1,18	-.92
	50	1,18	-.48
	51	1,14	-3.20 **
	56	1,9	0
	76	1,12	-1.91
	90	1,14	.10
	92	1,9	-.31
	95	1,10	1.30

*$p < .05$. **$p < .01$. ***$p < .001$.

Attitude Scale Data

Comparing changes within groups on attitude scale items over the three phases of the study would detect change in students' opinions of the different observation systems as a function of training. According to the original hypothesis, Group A, which received the research-based training prior to the first attitude scale administration, should show little change whereas Group B should show significant change in their attitudes toward the computer-based feedback system between the first and second intervention phases. For purposes of presentation, the attitude scale items have been grouped categorically, with field note item analyses presented first, followed by the computer feedback, then checklist item analyses. Tables 13 through 15 show Kolmogorov-Smirnov Z scores and the associated 2-tailed probability levels for items in each group. The first analysis involves field note items. Results are presented in Table 13.

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Insert Table 13 about here

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It can be seen from the data that there were no significant differences in the attitudes of Groups A or B regarding the field note feedback. Only the fourth item approached statistical significance for Group A, involving their perceived degree of comfort with the use of field notes as an evaluative tool. This finding,

Table 13

Analysis of Within Group Change in Attitudes Across Phases: Field Note Items

		Comparison Period
Group	Item No.	Int. 1 to Int. 2
A	1	$Z= .43$, $p<.99$
	2	$Z=1.06$, $p<.21$
	3	$Z= .64$, $p<.81$
	4	$Z=1.28$, $p<.08$
	5	$Z= 0$, $p<1.00$
B	1	$Z= .94$, $p<.34$
	2	$Z= .94$, $p<.34$
	3	$Z= .71$, $p<.7($
	4	$Z= .47$, $p<.98$
	5	$Z= .71$, $p<.70$

Note.

1. The supervisors were skillful in providing field note feedback.
2. The field note feedback was helpful in improving my teaching skills.
3. The field note feedback doesn't provide me with clear ideas of what things I need to do to improve my teaching.

4. I feel comfortable with the supervisors using the field note method to evaluate my teaching.
5. The field note feedback should be retained as part of the undergraduate field supervision program.

albeit nonsignificant, indicates that students in Group A felt more satisfied with the field note feedback during the first intervention phase, and less satisfied during the second.

Group attitude changes regarding the computer observation system feedback are presented in Table 14.

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Insert Table 14 about here

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Group A had only one significant difference across both attitude scale administrations. Their responses to item number two indicated that they did not always receive computer summaries from the supervisor/observers during the first phase, but always received them during the second phase. This differential response pattern was unexpected, but probable reasons for its occurrence will be discussed.

The most noticeable attitude change occurred in Group B, whose responses to six of the eight items were statistically significant. This indicates that the

Table 14

Analysis of Within Group Change in Attitudes Across Phases: Computer Observation System Items

		Comparison Period
Group	Item No.	Int. 1 to Int. 2
A	1	Z= .85, p<.46
	2	Z=1.49, p<.02 *
	3	Z= .21, p<1.00
	4	Z= .43, p<.99
	5	Z= .21, p<1.00
	6	Z= .64, p<.81
	7	Z= .43, p<.99
	8	Z= .21, p<1.00
B	1	Z=1.89, p<.002 **
	2	Z=1.89, p<.002 **
	3	Z=1.41, p<.04 *
	4	Z=1.41, p<.04 *
	5	Z=1.65, p<.009 **
	6	Z= .47, p<.98
	7	Z= .94, p<.34
	8	Z=1.41, p<.04 *

Note.

1. The computer was always used during the observations.

2. I always received the computer summary from the observers.
3. The supervisors clearly explained the computer summaries of my teaching behaviors.
4. I clearly understand the various categories on the observation system.
5. The computer-based feedback was helpful in improving my teaching skills.
6. Being evaluated by the computer observation system is a threatening experience.
7. I feel comfortable with supervisors using the computer observation system to evaluate my teaching.
8. The computer observation feedback should be retained as part of the undergraduate field supervision program.

attitudes of students in Group B toward the computer observation system became much more positive following the ALT training session. While their attitudes toward the computer feedback were overwhelmingly negative on the first attitude scale administration, this changed during the second intervention phase. The results clearly indicate that attitudes toward the microcomputer-based feedback becam uch more positive following training.

Student responses regarding the checklist items are presented in Table 15.

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Insert Table 15 about here

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Again, the data indicate no significant change in the attitudes of Group A between the two intervention phases. Their responses were highly positive on both administrations of the attitude scale. Group B, on the other hand, altered their opinions on three of the four items relating to the checklist feedback. Before receiving the ALT training, they did not feel the checklist should be retained as part of the undergraduate field supervision program; after training, they did. Thus, this training appears to have positively affected their opinions regarding this form of feedback.

These results unequivocably show that the ALT training/feedback influenced students' opinions toward the computer-based feedback in a positive manner. As expected, Group A maintained their positive attitudes, for they had received research-based training and feedback prior to the first attitude scale administration. Their attitudes regarding the computer-based and checklist feedback also showed no deterioration over time. At the same time, their positive attitudes toward the field note feedback were maintained.

On both attitude scale administrations, students in Group B were consistent in their attitudes toward the

Table 15

Analysis of Within Group Change in Attitudes Across Phases: Checklist Items

		Comparison Period
Group	Item No.	Int. 1 to Int. 2
A	1	Z=.21, p<1.00
	2	Z=.64, p<.81
	3	Z=.21, p<1.00
	4	Z=.21, p<1.00
B	1	Z=1.41, p<.04 *
	2	Z=1.18, p<.12
	3	Z=1.41, p<.04 *
	4	Z=1.41, p<.04 *

Note.

1. The supervisors were skillful in explaining the checklist feedback.
2. The checklist feedback (High-Medium-Low) was helpful in improving my teaching skills.
3. I feel the checklist feedback system too confusing to be useful.
4. The checklist feedback system should be retained as part of the undergraduate field supervision program.

field notes, indicating that it was a useful form of feedback both times. However, on the computer-based and checklist feedback items, there were significant differences observed in their responses. The attitudes of students in Group B became significantly more positive following the ALT training session. This indicates that the training played a major role in altering their perceptions regarding the value of this form of feedback. This same pattern was also observed in their attitudes toward the usefulness of the checklist feedback.

The available attitude scale data clearly indicate that the ALT training was instrumental in altering student reactions to the microcomputer-based feedback. Students involved in the study were also asked to respond to six open-ended questions regarding both types of feedback, and their responses will now be discussed.

Attitude Scale Comments

In addition to evaluating responses to the different forms of feedback on the quantitative, i.e., rating attitude scale, students were also asked to react to six open-ended questions. Their responses were analyzed in a manner designed to identify concerns and issues and to assess values (Guba & Lincoln, 1981).

The first question asked students what they liked about the field-note feedback. Responses were categorized into three areas: Personal Comments, Specificity, and Constructive Criticism. Personal

Comments was the largest category, with 18 responses. One example included "I felt this allowed the observer to say exactly how she/he felt about something." Comments indicated that students found the narrative portion of the field note feedback most helpful because it discussed specific events that occurred during the observation; they were easily able to relate the feedback to those events. There were also criticisms of this form of feedback, however. For example, one student commented "It was helpful in that it let me know my goods and bads but it didn't give me ideas of how to improve." Also, a student stated that " . . . Sometimes the evaluator would mearly (sic) write down what I had done which was not helpful. My opinion of the field note depended on the competancy (sic) of the evaluator." Thus, students did not always feel that field notes gave specific direction for improvement and some perceived this form of feedback as helpful only when the observer's opinion was valued.

The aspect of Constructive Criticism was also deemed important by some students, as evidenced by the inclusion of 11 comments in this category. This constructive criticism, when provided, was used by students to improve their teaching. A representative comment for this category was: "The field note feedback proved useful when suggestions and other options were included along with my evaluation. --- always added constructive comments and ideas for me to try. --- also would explain and comment on my performance and how to improve and areas of concern."

A third category, Specificity, contained 12 comments, including "The supervisor was able to be specific in her own words. The computer doesn't allow that," and also "It was specific. This part of the feedback informed me of particular aspects of my lessons that were not mentioned on the computer observation or checklist feedback." Thus, the observer's ability to relate field note feedback to specific parts of the lesson was valued by students.

From the above comments, it appears that the students place a great deal of importance on the more personal aspect of the field notes. This form of feedback allows them to place their lesson(s) in context, with comments specifically related to observed events. It should be emphasized, however, that this is perceived as helpful only when the observer's opinion is valued. When the feedback was merely a reiteration of the lesson and/or when it failed to provide specific suggestions for improvement, field note feedback failed to meet the perceived professional development needs of the teacher trainees.

A second item asked students what they disliked about the field note feedback. Comments fell into three major categories: Quality, Subjectivity, and Accuracy. In the category of Quality, representative comments include: "I felt many times the observer wrote things just to fill up space on the sheet--things that were irrelevant to the observation," and "Much too general. The system is too open ended." Lack of specificity and failure to provide meaningful suggestions and comments were areas of concern most frequently mentioned in this category.

Observer Subjectivity was also criticized. Some students commented that the field note feedback was "Mostly opinions. The feedback is based on how someones' own teaching techniques (are)," and "The only problem is that the supervisor is judging me by personal standards and ideas of what 'good' teaching is." The observers were not always perceived as expert teachers and, when this was the case, their comments and suggestions were not taken seriously. This position was supported by other students' comments which questioned the accuracy of the feedback they received.

When asked what they liked about the computer observation system feedback, student comments fell into five categories: Clarity, Specificity, Breadth, Efficiency, and Personal Instructional Information. Examples of each include the following comments, respectively: "It broke everything down into small categories, which gave a clearer picture of how I was doing"; "It's concrete on the percentages. It evaluated things I don't really think of"; "This is a very comprehensive feedback system and allows the instructor to evaluate many things, things that the observer may not have otherwise had time to comment on"; "It was an efficient way of covering specific parts of the observation of the student teaching process. It helped to put things in perspective for me the student so far as the types of things I might improve to be a more effective teacher"; and "To see improvements from the beginning that can be used for comparisons." This last category, Personal Instructional Information, was by far the largest, with 18 comments related to this aspect of the computer-based feedback.

Negative comments regarding the computer feedback fell into the categories of: Inaccurate, Confusing, and Distracting. Examples of each category include: "I did not think that the percentages of time I was actively instructing were a fair estimate of what was actually taking place. I thought I was activelly (sic) teaching more than the computer sometimes indicated"; "Too confusing, never understood clearly"; and "It was extremely annoying to have the printout run in class. This happened to me once in the fall and once in the spring."

Thus, the students liked the computer observation system because it was specific, comprehensive, and able to objectively gauge an individual's improvement over time. However, they still valued the descriptive information provided by written accounts of the observed lesson. The computers gave terse, objective performance data on specific teaching behaviors. Some students found this form of feedback somewhat more difficult to interpret.

When asked if their feelings regarding the computer-based feedback changed as a result of the ALT training, the majority of students answered in a positive direction, with 13 students agreeing that the training was helpful in understanding and applying the information. At the same time, five students indicated that they did not find the ALT training personally helpful.

Finally, students were asked to suggest what they perceived the most beneficial type of feedback to be. Fourteen answered that field note feedback alone would be best, although 10 of those 14 added a caveat that more discussion was necessary to make this form of feedback useful. Three answered that computer feedback alone would be best, while 13 felt that a combination of field notes and computer-based feedback would be optimal. Finally, three individuals mentioned that they would prefer to have their supervising teacher, i.e., the classroom teacher, evaluate their instructional performance.

In conclusion, while students were more positive in their opinions regarding the field note feedback, the reasons cited were not closely related to the improvement of instructional behavior, i.e., they liked the field notes because they were "related" to what actually happened during the observation. Some perceived the computer feedback as "hard data," unable to take classroom environmental variables into account. The positive comments made regarding the computer-based feedback, however, stressed its specificity, its comprehensiveness, and its ability to objectively measure change over time regarding the use of more effective teaching strategies over time. The observational data clearly show that this was the form of feedback which caused significant improvement in actual teaching behavior.

In conclusion, students indicated that the most helpful form of performance feedback would be some combination of field note and computer feedback. Field notes provide important contextual information while the objective feedback caused significant positive changes in the use of more effective teaching practices by the preservice teachers involved in this study.

DISCUSSION

This study was conducted with two groups of students over three periods, or phases. During the baseline phase, both groups received field note feedback from the observers regarding their classroom teaching behavior. No significant differences were observed between the groups on the dependent variables (e.g., levels of student engagement, active instruction, passive instruction and transition). In other words, one would be unable to discriminate between the groups based upon their observed performance during the baseline phase. For purposes of discussion, observational data results will be addressed first, followed by checklist item and finally, attitude scale results.

Following the first training session when Group A received the ALT training/feedback, differences in performance levels on the dependent variables were observed: students in Group A attained a significantly higher level of active instruction than students in Group B, even though Group B had a mean increase of 19 per cent. This difference indicates that the ALT training/feedback altered the students' use of specific instructional behaviors more than the alternate, e.g., humanistic classroom management, training combined with traditional field note feedback. As hypothesized, when Group B received the ALT training and feedback, i.e., during the second intervention phase, their active instruction level also showed significant gains, becoming highly similar to the observed means of Group A. No differences were observed between the groups in the category of active instruction during this period.

This same pattern held true for observed levels of passive instruction. After obtaining highly similar baseline means, both groups reduced their use of this instructional strategy during the first intervention phase, but Group A's reduction was much sharper (23 to 3 per cent) than that of Group B (26 to 19 per cent). Again, the ALT training and computer feedback appeared to affect teacher trainee behavior more strongly than the alternate training and field note feedback. The levels of passive instruction observed for both groups became nearly identical during the second intervention phase, after Group B had received the ALT training.

This same pattern was again observed in the category of transition. Group A had a mean transition level which was significantly lower than Group B's mean following ALT training and feedback. Group B showed a significant reduction in their observed transition score during the second intervention phase, after they received the ALT training/feedback. Unexpectedly, Group A's level rose slightly between the first and second intervention phases and that increase, combined with Group B's marked reduction, created a significant difference between the groups during the second intervention phase, when it was expected that the group means would be more homogeneous.

As this study controlled for effects due to subjects' history, maturation, and skill, the observed results indicate that the ALT training and feedback was a more effective strategy than the use of primarily field note feedback in influencing students to alter observed instructional behavior specifically related to Academic Learning Time categories.

The positive influence of the combined ALT training and feedback was also observed when each groups' use of effective teaching behaviors was examined over the three phases of the study. Observational data indicate that Group A increased their level of active instruction an average of 28 percentage points between baseline and the first intervention phase, following the research-based training. Students in this group had an average of 95 per cent active instruction during the first intervention phase. Because the observed group mean was so high, some students almost certainly experienced a ceiling effect, indicating that the observed improvement was distributed among all students in the group. This high level of active instruction was also maintained through the final phase of the study.

Concomitantly, the passive instruction and transition levels of Group A students showed a significant reduction during the first intervention phase, remaining low throughout the study. All of these changes indicate that ALT training, in conjunction with related computer-based observational feedback, caused significant improvement in the way these students structured their teaching.

In addition to the students in Group A increasing their use of more effective teaching strategies, beneficial effects were also observed on classroom student engagement levels during the first intervention phase. Active student engagement showed a significant increase, while passive student engagement levels declined. Since these constitute an ipsative measure, i.e., if one increases the other decreases, this change was expected. However, in addition to statistical significance, the observed increase in active student engagement shows both practical and theoretical significance, for this variable has consistently been related with increased student achievement.

The highly positive results observed in Group A's teaching behaviors during the first intervention phase are tempered somewhat by the results observed in the second intervention phase. During this time, student use of active instruction decreased eight percentage points, while passive instruction increased four percent and the level of transition increased by three percentage points. Student engagement levels changed little however, having a combined loss of only one per cent.

While the reasons for this reduction, albeit slight, in the use of more effective teaching behaviors might be many, four seem most plausible. First, the "booster" training provided students in Group A prior to the second intervention phase may not have been sufficiently strong to maintain previous levels. Second, the change of field placement may have had an influence. The second intervention phase of the study was conducted in urban classrooms, an environment highly unlike previous placements. This difference may have accounted for some of the observed reductions in the dependent variables. Third, a ceiling effect may have been a factor. Students in Group A obtained a mean level of 95 per cent in this category, with a standard deviation of 5.2 percentage points. In other words, some students were actively instructing the entire observational period. This is an unrealistic and perhaps even undesirable level to maintain, and the reduction may have reflected a naturally occurring correction effect. Finally, students in Group B demonstrated such a dramatic reduction in their transition rate during this same phase and this reduction, combined with Group A's slight increase, caused the observed difference between the groups. This effect could also be interpreted as an artifact of the potency of the ALT training/feedback paradigm.

At any rate, the observed changes were minimal and may in actuality indicate a more realistic instructional profile than the trainees' consistently obtaining optimal levels. If the majority of public school teachers achieved active instruction rates in the high 80's and student engagement rates in the low 90 per cent range, resulting in the predicted gains in student performance, the present clamor for accountability and imposed teacher regulations would be quieted.

Observational data regarding classroom student engagement rates during the second intervention phase for both groups were disappointing. While these rates approached, they failed to reach the pre-established level of significance, indicating a lack of correspondence between improved teaching performance and subsequent effects on student on-task behavior. From the available data, a one-to-one relationship between these two events cannot be extrapolated. It would probably be most accurate to say that the use of effective teaching strategies influences, but does not control, increased student task engagement.

Because students in Group B received information unrelated to research-based teaching behaviors or to the computer observation system, no changes were expected in their observed levels on the dependent variables during the first intervention phase. In actuality, Group B students showed positive change on all three teacher behavior variables. Their level of active instruction increased 10 percentage points, while their passive instruction and transition levels decreased by six and three per cent, respectively. However, none of these changes were significant.

It is unclear whether students in Group B would have continued to gradually improve in their observed use of more effective teaching behaviors over the final phase of the study. This question could have been clarified by having a third group with an extended baseline phase in order to observe whether the trend toward increased use of effective teaching behaviors was repeated, and whether or not these behaviors were maintained over time. Data from this study, however, indicate that while the changes in teacher instructional behavior were positive, they were not nearly as robust as those observed in Group A during the same period. Neither the humanistic classroom management training nor the field note feedback significantly affected Group B students' instructional behavior during this first intervention phase.

During the second intervention phase, after Group B had received the ALT training and feedback, their mean active instruction level rose significantly over their baseline mean, while their passive instruction rate dropped significantly (from 20 to 5 per cent), replicating the effects observed in Group A. Additionally, the amount of time spent in transitional activities showed a significant reduction, indicating that the students were more aware of research findings relating to this instructional variable.

Again, increases observed in the use of more effective teaching behaviors did not significantly affect the student engagement levels observed for Group 3 during the second intervention phase. Again, ceiling effects may have influenced the results, since the combined, i.e., active and passive, student engagement level for students in this group ranged from 88 to 92 per cent over the course of the study. This lack of statistically significant improvement, combined with the inconclusive nature of the between groups difference, tends to confirm the imprecise relationship between the increased use of effective teaching behaviors and classroom student engagement levels. Good teaching does not always assure student engagement. However, the converse, i.e., that student engagement tends to occur in the presence of effective teaching practices, was clearly substantiated by the results of this study.

The observational data obtained on the teaching behavior of students involved in this study provides a strong case that the combination of ALT training and computer-based observational feedback has a more significant effect in altering students use of specific teaching behaviors than traditional feedback procedures. Although Group B's observed levels on the dependent variables increased from baseline to the first intervention phase, the increase was slight, whereas Group A students showed significant improvement. Also, each group showed significant improvement in their use of more effective teaching behaviors from their individual baseline periods to the appropriate intervention phase. These results indicate that, while traditional feedback in conjunction with additional classroom experience may cause students to show minimal improvement, research-based information in combination with objective feedback directly related to that information produces far stronger changes in observed behavior.

These accumulated results are viewed as evidence that students are capable of understanding and applying research-based information early in their professional career development. They are able to interpret objective performance feedback and use the information to shape their classroom behavior in a positive direction. These changes in teacher behavior theoretically serve to create a classroom learning environment which is more conducive to student academic achievement.

The checklist items were also used to evaluate student growth in implementing more qualitative teaching behaviors. Because of its limited range (each item was rated on a 3-point scale), significant differences between the groups were not anticipated, although it was expected that the groups would show improvement in their mean ratings following the ALT training.

For the most part, this was indeed the observed effect. Only four items significantly differentiated between the groups following the first intervention phase. These items related to the teacher trainees' conveying to pupils the importance of the instructional activity and the quality of student performance. Also, items addressing lesson and time organization showed significant differences between the groups in favor of Group A during the first intervention phase. During the second intervention phase, i.e., after both groups had received the ALT training, only one significant difference was observed between the groups, and it involved the pacing of instruction.

However, when the mean ratings on the checklist items for each group were examined individually, differences became much more obvious: Group A students significantly increased their scores on 15 of the 20 checklist items during the first intervention phase. Furthermore, while the number of items selected for analysis for this study was restricted to 20, observers were directed to rate the students on any of 68 items judged appropriate for a given student and/or situation. From the baseline through the first intervention phase, students in Group A showed significant improvement on a total of 32 items, a change that seems highly unlikely to occur as a result of chance improvement alone. Thus, the ALT training appears to have influenced positive change on almost half of the total items in the checklist for students in Group A.

It was hypothesized that students in Group B would show little change in their mean checklist ratings between the baseline and first intervention phase, then show greater improvement between the first and second intervention phases. The data indicate that, in the first comparison period, Group B students showed significant improvement on only two of the 20 items selected for analysis and on only four out of the total 68 items. Between the first and second intervention phases, significant improvement was observed on five of the 20 items and on eight of the total checklist items. Thus, while students in Group B more than doubled the number of items showing highly significant improvement, the effect was not as large as anticipated.

These findings suggest that after teachers received the ALT training and feedback from the checklist data source, they became more aware of the dynamics involved in teaching, i.e., lesson flow, alerting students to both the intent of the instructional activity and the value of their contribution to it. However, any conclusions drawn from the available data must be viewed tentatively because of the limited number and magnitude of the differences and the restricted evaluative range of the checklist rating scale.

The attitude scale was initially administered to both groups at the end of the first intervention phase, after students in Group A had received both the ALT training and three computer-based performance evaluations; at that point, students in Group B had received the alternate training and field note feedback exclusively. The attitude scale was administered again at the conclusion of the study, after both groups had received the ALT training.

Both groups expressed highly positive opinions regarding the field note feedback throughout the study. Students, in general, indicated that the supervisors were skillful in providing field note feedback, that field note feedback was helpful in improving their teaching skills, and that this information provided them with ideas of things they needed to do to improve their teaching. They also stated that they felt comfortable with this form of performance evaluation and that field note feedback should be retained as part of the field supervision program. Two reasons most frequently cited in their comments were that this type of feedback is more situation-specific and also is more personally relevant than the computer-based feedback.

On the first administration of the attitude scale, students in Groups A and B diverged significantly in their responses to the computer observation system items. Group A students indicated that they understood the observational categories significantly more often than Group B students. Since the sole experimental manipulation regarding this item involved the differential training received by the students, it can be assumed that the ALT training influenced the more positive response to this item. Students in Group A also indicated that the computer feedback helped them improve their teaching significantly more often than Group B students.

None of the students reported feeling threatened by the microcomputer observation system. However, when asked whether this form of feedback should be retained as part of the field supervision program on the first attitude scale administration, Group B students answered in a negative direction, whereas Group A students felt significantly more positive about retaining it. This difference between the groups disappeared after the second ALT training. These results indicate that, when students understood and were trained to use the information to improve their teaching, they perceived it in a more positive manner.

Results also indicated that the groups differed significantly in their perceptions of the checklist item feedback following the first intervention phase. Students in both groups indicated that the observers' ratings of checklist items were helpful in improving their teaching skills. However, students in Group B felt that the checklist feedback system was too confusing to be useful, a seemingly contradictory response. Some students in this group noted that the 3-point scale was not sensitive enough, i.e., that it did not specify what was wrong or how it could be improved. Perhaps this criticism influenced them to answer the second item in a more negative direction.

Results from the initial administration of the attitude scale indicated that students who had received the ALT training expressed significantly more positive attitudes about retaining the checklist feedback system than students who had received the alternate training. This difference disappeared after both groups had received the ALT training and computer-based feedback.

To summarize, student responses to the attitude scale items appear to indicate that thorough training is essential to the acceptance and understanding of the computer-based observational feedback. When students lack an adequate knowledge base regarding the quantitative feedback, they view it with some annoyance and little understanding. More importantly, they are unable to see its contribution to their professional development. However, when they understand the relationship between the observational data and their teaching performance, they are able to use it in a way that significantly increases their use of more effective teaching behaviors. At the same time, students still value field note feedback provided by competent observers. This information allows them to place their lessons in context, something missing in the more quantitative performance evaluation. Both groups unanimously indicated that both forms of feedback should be utilized in the undergraduate field supervision program after the ALT training and feedback had been provided.

While the results obtained in this study clearly indicate that training is essential in the application of specific knowledge to improve individual teaching skills and to student acceptance of a novel yet effective form of performance feedback, the study could have been improved by incorporating certain changes. One would have been to increase the number of observations. Since this study was conducted within the constraints of an existing preservice teacher education program, this alternative was impossible. It has been noted repeatedly that naturalistic observations are the greatest expenditure in field research (Johnston & Bolstad, 1978). This factor certainly contributed to the relatively small number of observations upon which this study was based. If the basic design were to be replicated with a greater number of student observations, time series analysis could be utilized to further illuminate the relative effects of experience, differential feedback, placement, and training.

Second, a more accurate performance evaluation may have been obtained using a less obtrusive observation technique. Because these observations were conducted in naturalistic settings, the situation did not allow unobtrusive observation conditions, e.g., one-way mirrors where teacher trainees were unaware they were being observed. The intent of this study was to inform these trainees of more effective teaching techniques as identified in the research literature, and to provide feedback regarding their use in natural situations. This goal was accomplished, so perhaps covert observations would not have been an appropriate technique to use during this phase of their professional development.

Third, more field reliabilities could have been obtained. Again, cost and time factors proved prohibitive within the constraints of the present study. However, were the study to be replicated, this would represent a significant improvement. Indeed, replication is strongly suggested, for it is unwise to accept the observed relationships as real on the basis of only one study, no matter how significant the results (Borg & Gall, 1983).

Finally, the checklist and attitude scale items did not undergo sufficient field testing, so the issues of rating reliability and item validity need to be examined. These scales were primarily intended to gauge qualitative performance and attitude change in the students as a function of the different experimental treatments. All reported results should be viewed with this purpose in mind. Future studies can and should determine individual item reliability and scale validity.

CONCLUSION AND IMPLICATIONS

The results of this study clearly demonstrate the potency of a specific training program in conjunction with an objective feedback system for significantly increasing specific preservice teaching behaviors. The present data both support and extend effects observed with inservice special education teachers (Semmel et al., 1976; Rieth & Frick, 1978). Providing teachers with research-based information and objective performance feedback results in significant improvements in their use of more effective teaching behaviors. This study also demonstrated that high levels of student engagement were dependent upon teachers' displaying higher levels of active instruction and lower levels of passive instruction and transition. However, a direct relationship between increased levels of ALT teaching behaviors and student engagement was not found.

Future studies should be undertaken to determine if the effects observed in this study are replicated in different settings. This would also help to validate the observation system as well as the checklist and attitude scale items. Expanding the rating scale for the checklist items should be considered. Otherwise, it might be omitted from further investigation, proving too subjective an instrument to be an effective evaluation tool.

The observation system could be expanded to include other instructional procedures which have been empirically related to increased student academic achievement. One example might involve including information and observational feedback about students' application of specific behavior management techniques as well as their effect on pupil behavior. Another might examine teachers' lesson structure, e.g., review procedures, clarification/explanation period, demonstration, provision of successful practice, etc.

Finally, normative data should be collected, both on preservice teacher behavior rates as well as current teachers who have been identified by their peers as "master" teachers at all educational levels. This information would provide ranges of optimal criterion levels for future observational feedback. The use of such an expert systems approach, objectively examining what good teachers do as they go about their teaching as well as what students do in response to these actions, would go a long way toward obtaining various profiles of truly effective teachers. Once a series of profiles had been established, it could be empirically validated and serve as a model for preservice teachers.

Student participants involved in this study were very interested in becoming more effective teachers. Further clarification of what constitutes good teaching, the provision of specific information and consistent, objective feedback to teacher trainees would add great credibility to existing teacher education programs.

Teaching is more than an art, it is the thoughtful execution of a number of specific behaviors, behaviors which can be mastered by prospective teachers. This study has demonstrated one way this might be accomplished.

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Appendix A: Standard Field Note Feedback Form

INSTRUCTIONAL OBSERVATION

Student Observed Sally Student Date January 20, 1986

Subject/Grade level History/Junior High Time 1:30 to 2:00 p.m.

Focus for Observation general

Sally was working with a small group of three boys and two girls, reviewing facts from a previous history lesson. Sally would ask each a question in turn. If that student could not answer it, others would raise their hands to answer. This procedure was followed for about 20 minutes, then Sally provided a 10-minute explanation of some homework she wanted the students to complete for the next day.

\+ You maintained good eye contact with the students who were answering the questions.

\+ Touching Jimmy on the knee when his attention wandered half way through the lesson was effective in "bringing him back" into the group.

\- When one student was answering a question, I noticed that the others, especially the ones farthest away from you, were not paying attention to the answer. Perhaps if you had asked the questions randomly, the students would have paid closer attention, thinking that they might be called on next.

\- The homework explanation was not very clear. You could have brought in some examples of what you were describing, to show the students exactly what you wanted. I noticed many students doing other work while you were describing the assignment, and wondered if they were hearing what you wanted, and if they would be able to do the work.

Observed by Observer 13

Student Copy (white)
...sing Teacher Copy (yellow)
...ty Supervisor Copy (pink)

Appendix B. Training Material Showing Relationship Between Various Levels of Teacher Behavior and Subsequent Effects on Student Performance

Period:	JUN 30, 1982 to SEP 01, 1985
Student Number:	
Name:	
Special Education Status:	MAJOR
Number of Observations (in summary):	7
Amount of Observation Time (in summary):	237.4 minute(s)

OBSERVATION CODE SUMMARY

GROUP STRUCTURE	PERCENT	MINUTES
NULL	.3%	(.6)
WHOLE GROUP RESPONSIBILITY	56.7%	(134.5)
PARTIAL GROUP RESPONSIBILITY	22.2%	(52.6)
PART GRP RESPONS WITH ADDTL MONITORING	9.0%	(21.4)
INDIVIDUAL RESPONSIBILITY	11.9%	(28.2)

EDUCATIONAL ACTIVITY	PERCENT	MINUTES
NULL	.2%	(.6)
ACTIVE INSTRUCTION	99.5%	(236.1)
TRANSITION	.3%	(.7)

TEACHER INSTRUCTIONAL BEHAVIOR	PERCENT	MINUTES
NULL	.2%	(.5)
STRUCTURING+DIRECTING	2.0%	(4.8)
EXPLANATION+QUESTIONING-PLANNED	79.8%	(189.3)
EXPLANATION+QUESTIONING-NEED	8.0%	(19.0)
EVALUATIVE FEEDBACK	6.5%	(15.4)
TASK ENGAGEMENT FEEDBACK	2.3%	(5.4)
BEHAVIORAL FEEDBACK	1.2%	(3.0)

STUDENT(S) BEHAVIORS (TARGET GROUP)	PERCENT	MINUTES
NULL	.2%	(.5)
ENGAGED-ACTIVE	96.1%	(228.1)
ENGAGED-PASSIVE	1.7%	(3.9)
NON-ENGAGED-ACTIVE	1.4%	(3.4)
NON-ENGAGED-PASSIVE	.6%	(1.5)

STUDENT(S) BEHAVIORS (MONITORED GROUP)	PERCENT	MINUTES
ENGAGED-ACTIVE	100.0%	(21.1)

Appendix C. Sample Computer Observation Data Feedback

```
======================
        STEEL
  Observation System
        Report
Date: 09/24/85
Observer: 07
Subject: 145
======================
  Observation Codes
Total Time:  0: 8: 8
------------- ------- -
   GROUP STRUCTURE
PART GRP W/MON  :100.0%
----------------------
     ED ACTIVITY
ACTIVE INSTR    : 49.4%
PASSIVE INSTR   : 50.6%
----------------------
    TCHR INSTR BEH
OBSERV MONITOR  : 20.3%
STRUCTURE/DIRECT:  2.3%
EXP/QUEST-PLAN  : 41.6%
EXP/QUEST-NEED  :  7.8%
EVALUATIVE FDBK :  5.3%
TASK ENGAGE FDBK: 14.3%
BEHAVIORAL FDBK :  8.4%
----------------------
   PRI STUDENT BEH
ENGAGED/ACTIVE  : 43.0%
ENGAGED/PASSIVE : 49.2%
NON-ENGAGE/ACT  :  3.9%
NON-ENGAGE/PASS :  3.9%
----------------------
   SEC STUDENT BEH
ENGAGED/ACTIVE  : 55.9%
ENGAGED/PASSIVE : 30.5%
NON-ENGAGE/ACT  :  7.0%
NON-ENGAGE/PASS :  6.6%
======================
   Checklist Codes
IMP OF CURR CONT: HI
DEG OF TSK-ORIEN: HI
SEQ OF INSTR    : HI
USE OF DIFF MODE: MED
ACK OF PUP INPUT: HI
ENHANCE PUP KNOW: HI
AGE-APPROP      : HI
LEGIB OF WRITING: MED
AWARE OF CLS DYM: MED
CLARIF BEH EXPCT: HI
USE OF NON-VRB 0: HI
ADAPT TO CHG SIT: MED
ABLTY TO RELATE : HI
POS INTER W/PUPS: MED
DEG STU TSK ORIE: MED
LVL OF GRP PART : MED
RELEV OF PARTICP: MED
VARIETY PART MOD: MED
======================
    End of Report
======================
```

```
======================
        STEEL
  Observation System
        Report
Date: 03/17/86
Observer: 14
Subject: 169
======================
  Observation Codes
Total Time:  0: 4:22
----------------------
   GROUP STRUCTURE
WHOLE GROUP     :100.0%
----------------------
     ED ACTIVITY
ACTIVE INSTR    : 43.1%
PASSIVE INSTR   : 56.9%
----------------------
    TCHR INSTR BEH
OBSERV MONITOR  : 49.6%
STRUCTURE/DIRECT:  6.9%
EXP/QUEST-PLAN  : 19.5%
EXP/QUEST-NEED  :  3.4%
EVALUATIVE FDBK :  4.6%
TASK ENGAGE FDBK:  3.1%
BEHAVIORAL FDBK : 13.0%
----------------------
   PRI STUDENT BEH
ENGAGED/ACTIVE  : 25.2%
ENGAGED/PASSIVE : 64.5%
NON-ENGAGE/ACT  :  6.5%
NON-ENGAGE/PASS :  3.8%
----------------------
   SEC STUDENT BEH
NULL            :100.0%
======================
   Checklist Codes
IMP OF PUP PERF : HI
ORG OF PRESENT  : HI
PROV OF FEEDBACK: MED
EDUC RELEVANCE  : HI
AGE-APPROP      : HI
STIMULUS-VALUE  : HI
AWARE OF CLS DYM: HI
ADAPT TO CHG SIT: HI
MODERATE VOICE  : MED
DEG STU TSK ORIE: HI
VARIETY PART MOD: MED
======================
    End of Report
======================
```

Appendix D

Student Evaluation of Observation System

1. The field-note feedback was helpful in improving my teaching skills
2. The supervisors were skillful in providing field-note feedback.
3. The computer was always used during the observations.
4. I always received the computer summary from the observers.
5. The computer-based feedback was helpful in improving my teaching skills.
6. I clearly understand the various categories on the observation system.
7. The supervisors clearly explained the computer summaries of my teaching behaviors.
8. The checklist feedback (High-Medium-Low) was helpful in improving my teaching skills.
9. The supervisors were skillful in explaining the checklist feedback.
10. The computer observation feedback should be retained as part of the undergraduate field supervision program.
11. The field note feedback should be retained as part of the undergraduate field supervision program.
12. The checklist feedback system should be retained as part of the undergraduate field

supervision program.

13. Being evaluated with the computer observation system is a threatening experience.

14. The field note feedback doesn't provide me with clear ideas of what specific things I need to do to improve my teaching.

15. I feel the checklist feedback system too confusing to be useful.

16. I feel comfortable with supervisors using the computer observation system to evaluate my teaching.

17. I feel comfortable with supervisors using the field note method to evaluate my teaching.

For the following items, feel free to include other comments on the back of the page if you need more space:

19. What things do you like about the field-note feedback?

20. What things do you dislike about the field-note feedback?

21. What things do you like about the computer-based observation feedback system?

22. What things do you dislike about the computer-based observation feedback system?

23. In your estimation, what would be the most helpful type of feedback regarding your practice teaching performance?

24. Did your feelings regarding the computer-based feedback change as a result of the training you received? In what way(s)?