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The lasting effects of instruction in and supervision through Academic Learning Time-Physical Education on teaching behaviors as measured by Cheffers' Adaptation of Flanders' Interaction Analysis System

Stuart L. Dean
Ithaca College

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THE LASTING EFFECTS OF INSTRUCTION IN AND SUPERVISION
THROUGH ACADEMIC LEARNING TIME-PHYSICAL
EDUCATION ON TEACHING BEHAVIORS AS
MEASURED BY CHEFFERS' ADAPTATION
OF FLANDERS' INTERACTION
ANALYSIS SYSTEM

by
Stuart L. Dean

An Abstract
of a thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in the Division
of Health, Physical Education,
and Recreation at
Ithaca College

September 1991
Thesis Advisor: Dr. Victor H. Mancini

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ABSTRACT

This study investigated the long-term effects of instruction in and supervision through Academic Learning Time-Physical Education (ALT-PE) on teaching behaviors as measured by Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS). Twenty-six undergraduate physical education students participating in their secondary phase of their student teaching assignment were subjects. The placement of subjects to either the control or treatment group was based on whether they had received conventional supervisory feedback (control group) as part of O'Brien's study (1985) or systematic supervisory feedback (treatment group) as part of O'Brien's study. Each subject was videotaped on three separate occasions while teaching secondary physical education at his/her respective school. An expert coder used CAFIAS to code each videotaped session to provide the data on teaching behavior and interaction patterns as they occurred in the classroom. The CAFIAS codings were then computer analyzed, and percentages were determined for the major CAFIAS parameters and predominant interaction patterns. Descriptive statistics were calculated, and visual comparisons were made to determine the relative standings of both groups on each CAFIAS variable. Analysis of the major CAFIAS parameters revealed that those teachers in the treatment group used significantly more teacher acceptance and praise (TTAPR) and teacher use of questions (TTQR); they also utilized more group and individual class structure (P) in their classes. Students in the treatment teachers' classes exhibited more student-initiated behaviors, both teacher-suggested (TSITSR) and student-suggested (TSISSR). The control group teachers were more critical (7) of their students' ideas and efforts, they spent significantly more time giving directions (6)

and information (5) which led to predictable type responses from the students (8). From the findings it was concluded that physical education student teachers that received instruction in and supervision through ALT-PE during their undergraduate training had significantly different behaviors and interaction patterns than those student teachers that received only conventional supervisory feedback during their undergraduate training. This led to the rejection of the major hypothesis that stated there would be no significant differences in teaching behaviors between those physical education student teachers who received instruction in and supervision through ALT-PE during their undergraduate training and those student teachers who received only conventional supervisory feedback during their undergraduate training. It was also concluded that the effects of instruction in and supervision through ALT-PE were still maintained up to 1 year following the cessation of training and thus could be considered long-lasting.

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A Thesis Presented to the Faculty of
the Division of Health, Physical
Education, and Recreation
Ithaca College

In Partial Fulfillment of the
Requirements for the Degree
Master of Science

by
Stuart L. Dean
September 1991

Ithaca College
Division of Health, Physical Education, and Recreation
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of
Stuart L. Dean

submitted in partial fulfillment of the requirements
for the degree of Master of Science in the Division of
Health, Physical Education, and Recreation of Ithaca
College has been approved.

Thesis Advisor: _____

Committee Member: _____

Candidate: _____

Chairman, Graduate
Programs in Physical
Education: _____

Dean of Graduate
Studies: _____

Date: _____

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DEDICATION

My thesis is dedicated to my loving wife, Terri, for without her understanding and support attainment of this professional goal would not have been possible. She has not asked for anything in return for all that she has done for me. For this, I say, "Thank you and I love you."

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Chapter 1

INTRODUCTION

Today's educators, now more than ever, are coming under fire as questions arise as to the effectiveness of teachers in accomplishing their goal of educating the youth of today. In the past, typical efforts to evaluate or improve teacher effectiveness involved observation by the principal followed by conventional, subjective feedback. Unfortunately, this supervisory feedback often was unreliable, subjective in nature, and not a valid measure of teaching behaviors. In an effort to correct this situation, researchers have developed systematic observation instruments that provide the supervisor with objective data to modify behaviors and increase the effectiveness of the teacher. These instruments utilize a trained observer, recording systematically and objectively, a detailed description of in-class events as they occur in the classroom. A number of systematic observation instruments are now being used in the field of physical education in an effort to provide the teacher with an accurate description of what is taking place in the gymnasium. Darst, Mancini, and Zakrajsek (1983a) stated that the use of observation systems provides objective information and explains what is going on in the teaching of physical education. Through the use of these observational systems and the information they provide, the teaching process can be more clearly examined and explained. Teachers can become more effective in the classroom, as they become more aware of their behaviors and interactions with their students.

Interaction analysis (IA) is one such type of systematic observation instrument that provides objective information about teachers' and students' behavior patterns.

Darst, Mancini, and Zakrajsek (1983b) state that teaching behaviors can be developed, improved, and controlled through the use of IA. One IA system frequently used to provide supervisory feedback to improve teacher effectiveness is Cheffers' Adaptation of Flanders' Interaction Analysis System or CAFIAS (Cheffers, 1983). Cheffers' (1972) system was developed with the physical education setting in mind; nonverbal as well as verbal behaviors of both the teacher and the students are recorded, in addition to the class structure, the teaching agent, and the type of student responses. CAFIAS can be used to provide objective supervisory feedback to the teacher, and the teacher can then use this information to make the necessary adjustments in his/her teaching behavior to meet the needs of the students.

Over the past few years a number of researchers have used IA as an instrument in providing supervisory feedback to teachers. Hendrickson (1975), Vogel (1976), and Getty (1977) investigated the effects of instruction and supervision in IA on teaching behaviors in the gymnasium. Rochester (1976) and Inturrisi (1979) considered the effects of IA on teacher effectiveness, attitudes, and perceived teaching behaviors. The results of these studies indicated that those teachers trained in IA displayed more indirect teaching behaviors; they exhibited more teacher praise and acceptance and used more questioning in their classes compared to those teachers who did not receive IA training. In addition, these teachers were found to be more effective, to have more positive attitudes, and were more able to give an accurate estimate of classroom interaction.

Getty (1977), Mancini, Morris, and Getty (1979), and Mancini, Frye, and Quinn (1982) attempted to measure the lasting effects of instruction and

supervision in IA on teaching behaviors. Getty (1977) found the effects of training in IA could be maintained 1 month after completion of the training period. Mancini et al. (1979) also found this to be the case in relation to teacher effectiveness. Mancini et al. (1982) were one of the first to investigate the lasting long-term effects of instruction and supervision in IA on teaching behaviors, effectiveness, and attitudes of in-service physical educators up to 4 years following the completion of undergraduate teacher training. Their findings revealed that the teachers trained in IA were more indirect in their teaching style, were more effective, and had more positive attitudes; these effects were maintained 1 to 4 years later and, thus, could be considered long-lasting.

Another type of observational system developed for use in physical education classes is the Academic Learning Time-Physical Education (ALT-PE) instrument. The Beginning Teacher Evaluation Studies (BTES) revealed that it was possible to use student time-on-task for a measure of actual student achievement; this was named Academic Learning Time (ALT) (Fisher et al., 1978). This concept was later modified by Siedentop, Birdwell and Metzler (1979) to permit coding of physical education activity. This modification provided a means to measure the amount of ALT accrued by a student while participating in a physically active setting (ALT-PE).

A number of intervention and feedback studies have used the ALT-PE instrument to identify the amount of ALT-PE accrued in different settings. Birdwell (1980), Whaley (1980), Metzler (1980a), and Paese (1982) all used the ALT-PE instrument to describe events as they occurred in the classroom and as a means of providing and/or assessing the effects of supervisory feedback on teachers'

behaviors. Results indicated that feedback, both verbal and written, provided the teachers with valuable information to improve their instructional performance and thereby increase their students' achievement as measured by accrued ALT-PE. Grecic, Mancini and Wuest (1984) used the same population as Mancini et al. (1982) to investigate the lasting effects of instruction and supervision in IA on student ALT-PE during classes taught by in-service physical educators. This study revealed that the effects of instruction and supervision in IA on student ALT-PE were maintained 1 to 4 years after cessation of the training period. O'Brien (1985) investigated the effects of instruction and supervision through ALT-PE by studying the relationship between the perceived teaching behaviors and the observed teaching behaviors of 30 pre-service physical education teachers involved in micropeer teaching. It was revealed that those pre-service physical education teachers that received instruction and supervision through ALT-PE had students who accrued more ALT-PE in their classes than those students in the classes whose teachers only received conventional supervisory feedback. It was also found that those pre-service physical educators instructed in and supervised through ALT-PE were more accurate in estimating observed students' behaviors.

This study serves as a follow-up to O'Brien's (1985) study to determine the long-lasting effects of instruction and supervision through ALT-PE on the teaching behaviors of physical education student teachers. Will the teachers who received systematic supervisory feedback as part of O'Brien's study display different teaching behaviors than those teachers who received only conventional supervisory feedback as part of O'Brien's study? Additionally, will these effects be long-lasting?

Scope of the Problem

This investigation was conducted to determine the lasting effects of instruction and supervision using ALT-PE on the teaching behaviors of pre-service physical education student teachers. CAFIAS was the instrument used to record the behaviors and interaction patterns of the teachers and their students as they occurred in the classroom. Twenty-six undergraduate students participating in their secondary phase of their student teaching assignment while attending Ithaca College, Ithaca, New York, were videotaped on three separate occasions while teaching their secondary physical education classes at their respective schools. These subjects had participated in a prior study by O'Brien (1985) which investigated the effects of instruction in and supervision through ALT-PE on the relationship between perceived teaching behaviors and observed teaching behaviors of pre-service physical educators. The 78 videotaped sessions, 39 from each group, were then coded by an expert coder using CAFIAS. The data for analysis were collected from the videotapes, and the codings were then computer analyzed to determine the percentages of the major CAFIAS parameters and predominate interaction patterns. Descriptive statistics were calculated, and visual comparisons were made to determine the relative standings of both groups on each CAFIAS variable.

Statement of the Problem

This investigation was conducted in order to study the lasting long-term effects of instruction in and supervision through ALT-PE on the teaching behaviors of pre-service physical education student teachers.

Major Hypothesis

There will be no significant difference in teaching behaviors, as recorded by CAFIAS, between those physical education student teachers who received supervision and instruction ALT-PE during their undergraduate teacher training and those student teachers who did not receive supervision and instruction in ALT-PE during undergraduate training.

Assumptions of the Study

The following assumptions were made relative to this study:

1. The subjects selected were representative of the population of physical education student teachers at Ithaca College, Ithaca, New York.
2. The coding of three classes for each subject using CAFIAS was sufficient to yield valid data on the observed teaching behavior for each subject.

Definition of the Terms

1. Interaction Analysis (IA) is an observational technique that records the frequency of teacher-pupil interpersonal behaviors (Amidon & Hough, 1967).
2. Flanders' Interaction Analysis System (FIAS) is a system specifically designed to objectively analyze the verbal interaction between teachers and pupils as it occurs in the classroom (Amidon & Flanders, 1971).
3. Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) is a validated extension of FIAS developed to record verbal and nonverbal behaviors and specifically designed to describe teacher-pupil interaction in classes of physical activity (Cheffers, Amidon, & Rodgers, 1974).
4. Verbal behaviors are observable and audible human behaviors (Cheffers, 1972).

5. Nonverbal behaviors are observable human behaviors that are not expressed verbally (Cheffers, 1972).

6. Academic Learning Time-Physical Education (ALT-PE) is the amount of academic learning time accrued by a student while in a physical education class. Accrued ALT-PE is the amount of time a student is successfully engaged in a relevant motor task (Metzler, 1980b).

7. Pre-service student teachers are undergraduate students in physical education who have not yet participated formally in student teaching (van der Mars, 1979).

8. Student teachers are undergraduate students in physical education who are presently teaching their physical education practicum in a public school in order to fulfill the necessary requirements to receive their teaching certificate.

9. Conventional supervisory feedback is verbal input based on aspects of class control, organization, and management; class structure; and methodology (Mancini, Wuest, & Van der Mars, 1985).

10. Systematic supervisory feedback is verbal input based on data obtained through the use of a systematic observation instrument and is directed at teaching methodology and specific teacher and student behaviors (Mancini et al., 1985).

Delimitations of the Study

The following were the delimitations of this study:

1. The subjects were 26 physical education student teachers at Ithaca College, Ithaca, New York.

2. CAFIAS was the only instrument used to record the actual teaching behaviors.

Limitations of the Study

The following were the limitations of this study:

1. The findings of this study should not be generalized beyond student teachers of physical education similar to the subjects in this investigation.
2. The findings related to the observed teacher behavior may only be valid for comparison when CAFIAS is used for coding.

Chapter 2

REVIEW OF RELATED LITERATURE

The review of the related literature will focus on the following areas: (a) the use of systematic feedback to modify teaching behavior, (b) supervisory studies involving CAFIAS, and (c) supervisory studies involving ALT-PE. A summary is also provided.

The Use of Systematic Feedback To Modify Teaching Behavior

Supplying teachers with information on their teaching behaviors has been used as a method to modify and change their behaviors. In the past, this was typically accomplished through the use of conventional verbal feedback that only concentrated on aspects of class control, management, and methodology and was subjective in nature. Although this method did have some value, it did not provide the teacher with objective descriptions of the classroom events. Presently, the use of systematic observation systems, which provide immediate, objective descriptions of class events, has become popular. These instruments provide data on classroom teachers' and students' behaviors. The data are then used to supply the teacher with supervisory feedback; this technique is referred to as systematic supervisory feedback.

One means to provide teachers with systematic supervisory feedback is through the use of IA. IA instruments focus on teachers' and students' behaviors and interactions and provide an event-by-event objective description of what takes place in the classroom. IA, therefore, enables the supervisor and the teacher to select and modify the teaching behaviors that require attention.

One of the first to employ this technique of IA in an effort to modify teacher behaviors was Love and Barry (1971). They used the Love adaptation of Flanders' Interaction Analysis System with pre-service physical education students. Each student was videotaped four times over a 6-week period, with each tape being coded by all student teachers and a supervising instructor. The findings indicated that the student teachers were better able to examine their own teaching behaviors following training in IA. They also demonstrated the desire and ability to change these behaviors and developed a sense of cooperation among each other throughout the course of the training period.

Hughley (1974) used the OSU Teaching Behavior Scale to observe pre-service physical education teachers and to classify their behaviors as they taught. Hughley gave daily systematic supervisory feedback to four student teachers. The findings indicated that receiving daily feedback helped teachers display an increase in positive teaching behaviors.

Boehm (1974), Darst (1976), and Hamilton (1974) evaluated the effects of competency-based intervention modules on the behaviors of student teachers. Pre-service teachers at the elementary, junior high, and senior high levels served as subjects for these studies. Their results indicated that goal setting, cueing, graphic feedback, and reinforcement were effective in changing the rates of negative behavior interaction and increasing positive behavior interaction.

Dodds (1975) developed a peer intervention model in which student teachers observed and coded a lesson taught by a peer. Following the lesson, verbal and graphic feedback and reinforcement of positive behaviors were provided. The

peers demonstrated the ability to be both reliable and successful in providing feedback to create more positive behaviors.

Student teachers were instructed in applied behavioral analysis in an attempt to contribute to their own supervision. Dessecker (1976) investigated the effects of self-intervention on student teachers' behaviors. Three student teachers taught one lesson a day while wearing a small audiotape recording device. The tapes were coded following each lesson, and percentages were tallied for various teacher behaviors. The data were then sent to the college supervisor. The findings indicated that self-assessment is an effective technique for producing an increase in positive teaching behaviors and decreasing negative teaching behaviors.

Cotten (1976), Cramer (1978), and Hutslar (1977) studied the effects of training cooperating teachers in applied behavioral analysis on selected student teachers' behaviors at The Ohio State University. In order for comparisons to be made, control and treatment groups were established. The treatment group received instruction and supervision from the cooperating teacher; the control group student teachers did not. It was concluded that cooperating teachers can reliably code behaviors and successfully bring about desirable behavior changes in student teachers.

The effects of a planned intervention on student teachers' verbal feedback behaviors was studied by Metzler (1981). The intervention consisted of feedback sessions, reading sheets, and establishment of certain behavioral goals. Two recording techniques were utilized-- placheck and event-recording-- to establish baseline rates of selected behaviors. Results showed an increase in positive skill attempt feedback and positive non-skill feedback following intervention.

Another investigation that utilized a peer feedback system was conducted by McMillan (1979). Twenty-one pre-service physical educators attended a peer observation training course. Once reliability was established, each pre-service teacher observed and recorded selected target behaviors using placheck, duration, and event recording techniques. Feedback was then given to each observed pre-service teacher. The findings revealed that 69% of the behaviors that were intervened upon were changed in a positive fashion. Using the Observation System for Content Development-Physical Education (OSCD-PE), Gusthart (1982) investigated the teaching behaviors of 20 pre-service teachers during a five-stage, 2-year, supervised field experience. The results suggested that subjects in the study showed improvement, from their original levels, in the following areas: activity time, positive reinforcement, specific feedback, and individualized tasks as a result of their field experience.

Davis (1980) used both self-evaluation and cooperating teacher evaluation in an investigation to determine the value of the combined forms of feedback. The interventions attempted to increase positive feedback statements, increase specific content information, increase information statements, and decrease negative statements. Three groups of 10 randomly selected elementary level student teachers served as subjects. One group received only self-evaluation feedback, the second group received self-evaluation feedback plus cooperating teacher feedback, and the third group served as the control group and received only conventional feedback. The results indicated that the group that received both forms of feedback changed the selected teaching behaviors in the desired manner. The two remaining groups were inconsistent in their efforts to change behaviors; however, all three groups

showed an increase in the mean percentage of positive feedback as a result of intervention.

Using the Feedback Description System (FCDS), Arena (1980) attempted to increase the rate of augmented feedback of three student teachers. The findings revealed substantial increases in augmented feedback behaviors by the student teachers.

The Physical Education Teaching Assessment Instrument (PETAI) has been used to help change teachers' behavior through intervention with systematic observation. The PETAI instrument measures three teacher behavior variables and three student behavior variables. Regimbal (1986) investigated the effects of intervention on teacher behavior, engaged skill learning time, and student achievement. Selected for inclusion in this study were 12 physical education teachers and 12 fifth-grade students. The teachers were randomly assigned to control and treatment groups. The data for teacher and student were collected using the PETAI, videotape recording, and a 5-item skill test. The control group received conventional supervisory feedback, and the treatment group participated in a 7-week in-service program consisting of systematic supervisory feedback. It was determined that teacher behaviors can be changed in a positive manner through intervention with regards to engaged skill learning time and student management time. However, no relationship was found between changes in engaged skill learning time and student achievement or changes in teachers' behaviors and student achievements.

Supervisory Studies Involving CAFIAS

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) (Cheffers, 1972) was developed to record the interaction patterns and teaching behaviors in a physically active setting. CAFIAS is one of the most widely utilized IA systems in physical education. This systematic observation instrument was adapted from the Flanders' Interaction Analysis System (FIAS) (Flanders, 1960). Cheffers cited three major limitations of FIAS:

1. It was concerned with verbal behaviors only.
2. It was concerned only with classes that were conducted with the class structure as a whole.
3. It was concerned with the teacher as the sole teaching agent.

The use of CAFIAS allows for a more complete description of the behaviors and interaction patterns that occur in physical education classes by permitting the recording of both the verbal and nonverbal behaviors of the teacher and the student. CAFIAS is a valid extension of FIAS to record verbal and nonverbal behaviors. It is specifically designed for use in describing teacher-student interactions in predominantly physical activity settings (Cheffers et al., 1974).

CAFIAS consists of 10 nonverbal categories in addition to Flanders' 10 verbal categories; moreover, CAFIAS includes additional categories, such as the eight (8) to account for interpretive student behavior. CAFIAS also provides for the description of overall class structure and the teaching agency. The class structure can be coded as whole (W), where the entire class functions as one unit; or part (P), where the class is either into small groups or students are working individually; or (I), where no teacher influence is present.

Several studies have used CAFIAS to provide teachers with supervisory feedback and also as a method to study its effect on teachers' behaviors. Keilty (1975) investigated the effects of instruction and supervision in CAFIAS on pre-service physical educators. In this study the treatment group of teachers received 15 hours of instruction and supervision in CAFIAS, while the control group of teachers received only conventional feedback. The Teacher Performance Criteria Questionnaire (TPCQ) was used to measure teacher effectiveness. Keilty determined that no significant differences existed between the groups although information provided from the Pupil Opinion Questionnaire indicated that the teachers in the treatment group were perceived by their students to be more indirect in their teaching technique than those teachers in the control group.

Hendrickson (1975) investigated the effects of instruction and feedback through CAFIAS on the teaching behaviors of pre-service physical education teachers. The subjects in the control group viewed videotapes of their micro-peer teaching sessions along with conventional supervisory feedback. The treatment group subjects viewed their videotapes plus received instruction in CAFIAS and feedback in the form of computer printouts. The results indicated that those pre-service teachers who received instruction in and feedback through CAFIAS praised and accepted students' ideas more, asked more questions, were more student-oriented, used more small group and individual instruction, and were more indirect in their teaching compared to those pre-service teachers who received only conventional feedback. A similar type study involving 36 undergraduate student teachers was undertaken by Rochester (1976). In this investigation the assignment of subjects to treatment and control groups was done randomly. The subjects in

each group received instruction in and supervision through CAFIAS; however, the treatment group received additional training in the coding of CAFIAS. She found that pre-service teachers that received the additional training in the coding of CAFIAS had less teacher talk, more teacher questioning, and more student-initiated behavior compared to those student teachers in the control group. In addition, there was found to be a significant correlation between teacher effectiveness, as measured by the TPCQ, and teacher behavior, as measured by CAFIAS.

Vogel (1976) investigated the difference in behaviors of student teachers trained in CAFIAS and those student teachers not trained in CAFIAS. The treatment group of student teachers received 10 hours of instruction in the understanding and use of CAFIAS; the control group received no instruction in CAFIAS. He found that student teachers trained in CAFIAS allowed for greater contribution and used a greater amount of verbal praise and acceptance as well as nonverbal questioning of their students. Getty (1977), in a similar study, increased the time of training in CAFIAS to 15 hours for the treatment group while at the same time providing 15 hours of conventional feedback for the control group. The results obtained by Getty were very similar to those found by Vogel. They indicated that classes taught by teachers who received instruction in and supervision through CAFIAS produced more student-initiated behavior and used more questioning, both verbal and nonverbal, than those student teachers who received only conventional type feedback. Getty also found that the differences that were observed in the treatment group still existed 1 month after the training had concluded. In a follow-up study conducted by Mancini et al. (1979) using the same set of subjects, the lasting effects of IA on teaching behaviors was investigated.

The TPCQ was used to determine the lasting effects of instruction and supervision in CAFIAS on teacher effectiveness. They found that the treatment subjects were more effective and scored higher on the TPCQ than those subjects in the control group who received only conventional feedback. They also concluded that teacher effectiveness could be maintained 1 month after the training period had ended.

Stevens (1980) studied the effects of instruction and supervision in CAFIAS on the teaching behaviors of experienced elementary physical educators. Two males and two females served as subjects for this study; each was randomly assigned to control and treatment groups. CAFIAS was used to identify the teachers' behaviors as they occurred. The control group received only conventional supervisory feedback, and the treatment group received instruction, supervision, and feedback in CAFIAS and analysis of a CAFIAS computer printout for each observed lesson. Results indicated that the teachers who received instruction in and supervision through CAFIAS used more verbal and nonverbal praise and acceptance; used more verbal questioning; and had classes that exhibited more verbal and nonverbal student-initiated behavior, both teacher-suggested and student-suggested.

Inturrisi (1979) investigated the effects of feedback and instruction in CAFIAS on the teaching behaviors and attitudes of physical education student teachers. Each of the 28 student teachers that served as subjects for this study was randomly assigned to control and treatment groups. The subjects in the control group received only conventional supervisory feedback while those subjects in the treatment group received conventional feedback plus feedback from CAFIAS analysis. The results indicated that those student teachers who received feedback

and interpretation in CAFIAS had more positive teaching behaviors and attitudes than those who received only the conventional feedback.

Van der Mars (1979) studied the effects of instruction in and supervision through CAFIAS on the relationship between perceived and observed teaching behaviors of pre-service physical education teachers. Assignment of subjects to control and treatment groups was done randomly. Before and after each videotaped class session, each subject completed the Teacher Questionnaire on Objectives (TQO). This was to record perceived teaching behaviors. The subjects in both the control and treatment groups received conventional supervisory feedback; in addition, the treatment group subjects were shown a comparison of their post-class estimates from the TQO and observed scores from the CAFIAS computer printout. The findings revealed that those subjects in the treatment group were more accurate in their estimates of classroom interaction and were also more indirect in their teaching behaviors than those subjects in the control group.

Mancini, Wuest, Vantine, and Clark (1983) conducted a study to investigate the effects of instruction and supervision in CAFIAS on the ALT-PE of burned-out secondary physical education teachers. Six burned-out physical educators were randomly selected from a group of 10 teachers that scored high on the Maslach Burnout Inventory (MBI). From this group, three were randomly assigned for the control group and the remaining three were assigned to the treatment group. All teachers were videotaped nine times. The control group received conventional supervisory feedback; the treatment group received conventional supervisory feedback plus instruction, supervision, and feedback in CAFIAS in the form of computer printout of each videotaped class session. Results showed that the

treatment group teachers were characterized by increased use of praise and acceptance, use of teacher questioning, and teacher empathetic behavior, along with increased student-to-student interaction. These researchers demonstrated that systematic supervisory feedback can modify burned-out teachers' behaviors.

Mancini et al. (1982) were one of the first to investigate the lasting effects of instruction and supervision through CAFIAS on teaching behaviors, effectiveness, and attitudes. Sixteen in-service physical education teachers who had received their pre-service training no more than 4 years earlier served as subjects. Assignment of subjects to control and treatment groups depended on the type of supervisory feedback they had received as part of their undergraduate training. Control group subjects received only conventional supervisory feedback, while those in the treatment group received conventional supervisory feedback plus instruction and supervision in CAFIAS. All subjects were videotaped during two teaching sessions. The TPCQ was used to measure teaching effectiveness, and attitudes toward teaching were measured using the Teacher Situation Reaction Test (TSRT). The results revealed that those teachers who received instruction in and supervision through CAFIAS during undergraduate training used more verbal and nonverbal praise and acceptance, used more questioning, and were more indirect in their teaching style. In addition, the students in these classes exhibited more verbal and nonverbal initiated behavior. It was concluded that all these effects could be maintained 1 to 4 years after the completion of training in CAFIAS, thus these effects could be considered long-lasting.

Grecic et al. (1984) investigated the lasting effects of instruction and supervision in IA on student ALT-PE during classes taught by in-service physical

educators. The study was conducted to determine if there was any significant difference in the ALT-PE of students engaged in classes taught by in-service physical educators who received instruction and supervision in IA during teacher training and those who did not receive instruction and supervision in IA during teacher training. The subjects were 26 in-service physical educators who were placed into control and treatment groups depending on the type of supervisory feedback they received during undergraduate training. Each teacher was videotaped during two classes, and the videotapes were later coded using ALT-PE. Three randomly selected students were observed in each class. Results indicated that those teachers who received the systematic feedback through CAFIAS spent significantly less time involved in organizational and managerial activities which in turn led to an increase in accrued ALT-PE for their students.

Supervisory Studies Involving ALT-PE

In order to understand ALT-PE it is necessary to start with the Beginning Teacher Evaluation Studies (BTES). Carroll (1963) stated that the degree to which a student was involved in learning, as measured by time, was one of the most important factors in creating a favorable learning environment. In 1972 the Far West Laboratory for Education Research and Development in San Francisco identified time as the most important variable that was directly related to student learning; this research effort came to be known as BTES. As a result of the BTES studies, Berliner (1979) suggested that the time-on-task could be used as a product measure of actual student achievement. The concept of time-on-task was termed Academic Learning Time (ALT) and defined as the amount of time a student spends engaged in relevant tasks with a high degree of success. The BTES concept of

ALT was modified by Siedentop et al. (1979) to provide an observation instrument that would allow the coding of ALT in physical activity. This modification of ALT was named ALT-PE and was defined as the amount of ALT accrued by a student involved in a physical education class. A subcategory of ALT-PE, ALT-PE(M) is the amount of time a student is successfully engaged in a relevant motor task.

One of the first investigations that studied the effects of feedback on the ALT-PE of students was conducted by Whaley (1980). Twelve students from four schools were observed in their daily physical education class for 7 weeks. Teachers and students both were made aware that more engaged time and motor responses were desirable; however, the means of accomplishing this was not discussed. Daily feedback to both teachers and students continued throughout the study. The findings indicated that daily monitoring and feedback had no significant effects on the accrued ALT-PE or teaching behavior.

A similar study was initiated by Birdwell (1980). Three in-service physical educators received instruction and daily feedback in an effort to increase students' ALT-PE and ALT-PE(M). The teacher was not only made aware that changes in management, feedback, and student nonengaged time were desirable but also instructed them as to how this might be achieved. The results indicated a significant increase in both ALT-PE and ALT-PE(M) for all classes observed. ALT-PE increased from a average of 34.7% to 57.3%, and ALT-PE(M) increased from 17.5% to 37.7%.

Paese (1982) evaluated the effects of feedback on the ALT-PE and ALT-PE(M) of two student teachers teaching volleyball classes at the secondary level. Both teachers received verbal and written feedback following each of their observed

classes. The use of feedback led to an increase in motor engagement from an average of 18.5% during baseline to 43% after introduction of feedback. An increase was also seen in the amount of accrued ALT-PE(M); this changed from 7.5% to 19%.

Beamer (1983) investigated the effects of feedback on the ALT-PE of nine physical education students at the junior high level and their two teachers. Teachers were asked to increase large group monitoring, to organize the class into activities faster, and to give more feedback to the low-skilled students. The results indicated that through intervention an increase in ALT-PE was observed at one school but not at the other. The factors that affected ALT-PE were the nature of the activity, the amount of activity time available, and the efficient use of activity time.

Metzler (1981) assessed the value of interventions to increase ALT-PE. Three students and a student teacher from each of two archery classes served as subjects. The baseline measurements showed low percentages of ALT-PE(M), motor responding, and motor engagement. After the intervention, an increase in motor engagement and ALT-PE(M) was observed, along with a decrease in the student waiting time.

Griffin (1986) studied the effects of conventional supervisory feedback and systematic supervisory feedback on the teaching behaviors of 44 pre-service physical education teachers. Each subject was videotaped two times while teaching in a micro-peer setting. Subjects were randomly assigned to control and treatment groups. The subjects in the control group received conventional supervisory feedback while viewing their videotape. The subjects in the treatment group received instruction and supervision in ALT-PE in addition to the conventional

feedback. Results indicated that the students of the teachers in the treatment group accrued more ALT-PE, spent less time in transition and management behaviors and more time in game play. In addition, the teachers who received instruction and supervision in ALT-PE were more effective and provided more opportunity for their students to be actively involved.

O'Brien (1985) investigated the effects of instruction in and supervision through ALT-PE on the relationship between the perceived teaching behaviors and the observed teaching behaviors of 30 pre-service physical educators. Each subject was videotaped on three separate occasions while teaching in a micro-peer setting. Each tape was coded using ALT-PE. Prior to and following each videotaped class, each subject filled out the TQSA. Based on the ALT-PE categories, the TQSA was used to record the perceived students' behaviors. The treatment group received instruction and supervision through ALT-PE and the control group received conventional supervisory feedback. The subjects in the treatment group were also shown a comparison of their post-class estimates from the TQSA and the observed scores from the ALT-PE instrument. The results indicated that pre-service physical educators instructed in and supervised through ALT-PE provided their students with more opportunities to accrue ALT-PE than those students in the classes taught by the teachers that received only conventional feedback.

In a follow-up study to O'Brien's (1985) study, Higgins (1991) investigated the lasting effects of instruction and supervision through ALT-PE on the relationship between perceived and observed behaviors of physical education student teachers and their students. Twenty-six physical education student teachers, who had earlier participated in O'Brien's study, served as subjects for this

investigation. The assignment of subjects to control and treatment groups was based on the type of supervisory feedback they received as part of O'Brien's study. Each subject was videotaped on three separate occasions while teaching his/her regularly scheduled classes. Before and immediately following each videotaped class, each subject filled out the TQSA to record the perceived students' behaviors. Only the post-class estimates from the TQSA were used for analysis. Higgins concluded that physical education student teachers who received instruction and supervision through ALT-PE were significantly more accurate in estimating their students' behaviors. It was also revealed that physical education student teachers who had been instructed in and supervised through ALT-PE during O'Brien's study had students who accrued more ALT-PE than those students whose teachers only received conventional supervisory feedback. Finally, it was concluded that the effects of instruction and supervision through ALT-PE were still maintained up to 1 year following cessation of training.

Summary

The literature relevant to this study suggests that the use of systematic supervisory feedback is an effective means of modifying teaching behaviors. A number of researchers have used CAFIAS feedback in an attempt to alter student teachers behaviors. Getty (1977), Hendrickson (1975), and Vogel (1976) revealed that those student teachers who received instruction in and supervision through CAFIAS demonstrated more indirect teaching behaviors than those student teachers who received only conventional feedback. Inturrisi (1979), Rochester (1976), and van der Mars (1979) found these student teachers to be more effective, to have more positive attitudes, and to be more perceptive relative to classroom interactions.

Several studies have used the ALT-PE instrument to measure the amount of accrued ALT-PE in a physical education setting. The effects of various interventions and supervisory feedback on the accrued ALT-PE of students has been investigated by Birdwell (1980), Griffin (1986), Metzler (1981), Paese (1982), and Whaley (1980). These investigations revealed that teachers who received intervention and supervisory feedback provided more opportunities for accrued ALT-PE by their students. O'Brien (1985) investigated the effects of instruction in and supervision through ALT-PE on the relationship between perceived and observed teaching behaviors of pre-service physical educators. Results revealed that the pre-service physical educators who received instruction and supervision through ALT-PE were significantly more accurate in estimating observed students' behaviors in addition to providing their students with more accrued ALT-PE than those students whose teachers only received conventional feedback.

Studies that investigated the lasting effects of systematic supervisory feedback were conducted by Getty (1977), Grecic et al. (1984), and Mancini et al. (1982). They showed that the effects of instruction and supervision in CAFIAS on teaching behaviors and teacher effectiveness could be maintained up to 4 years following the cessation of the training period. Higgins (1991) found the effects of instruction and supervision through ALT-PE could be maintained up to 1 year following the completion of the training period.

Chapter 3

METHODS AND PROCEDURES

This chapter concerns itself with the methods and procedures utilized to gather data for this investigation. Included are selection of subjects, testing instrument, treatment of subjects, procedures, methods of data collection, coder reliability, scoring of data, treatment of data, and a summary.

Selection of Subjects

The subjects for this investigation were 26 physical education student teachers enrolled in either the 1985 fall or 1986 spring secondary phase of their student teaching assignment at Ithaca College, Ithaca, New York. These subjects had participated previously in a study by O'Brien (1985) that investigated the effectiveness of two types of supervisory feedback, conventional and systematic, on pre-service teachers' behaviors during micro-peer teaching. All subjects signed an informed consent form (see Appendix A).

Testing Instrument

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) (Cheffers, 1972) was used to measure the behaviors and interaction patterns between the teacher and their students. CAFIAS is a system developed primarily for use during physical activity classes to objectively record both verbal and nonverbal behaviors exhibited by a teacher and his/her students in a class setting. Behaviors are recorded every 3 s or any time a change in behavior occurs.

Treatment of Subjects

All subjects involved in the study were videotaped three separate times while teaching their regularly scheduled classes. The subjects were divided into two groups: those who had received conventional supervisory feedback as part of O'Brien's (1985) study (control group) and those who had received systematic supervisory feedback as part of O'Brien's study (treatment group).

Procedures

Twenty-six physical education student teachers participated in this study. Each subject was videotaped three times while teaching their normally scheduled classes. During the videotaping each subject wore a wireless microphone. The length of each videotaped teaching session was approximately 40 min. The activity chosen for each particular lesson, in addition to the type of teaching style, was decided by the student teacher. The subjects were divided into two groups; those subjects who had received conventional supervisory feedback were placed in the control group, and those subjects who had received systematic supervisory feedback were placed in the treatment group. A total of 78 classes were videotaped, 39 from each group.

Methods of Data Collection

Three videotapes of each subject provided data for the analysis. The videotapes were coded by an expert coder, Dr. Victor H. Mancini, using the CAFIAS instrument.

Coder Reliability

The reliability of the coder was determined by randomly selecting one videotape from the control group of teachers and one videotape from the treatment group of teachers. Each tape was coded during two independent observation sessions by Dr. Victor H. Mancini, an expert coder in the use of CAFIAS. The top 10 cells were ranked, and the Spearman rank-order correlation was utilized.

Scoring of Data

Data collected from the coding of CAFIAS were analyzed using a computer. The matrices, tabulated ratios, and the percentages of behavior exhibited were indicated on the computer printouts.

Treatment of Data

Descriptive statistics were calculated. Visual comparisons of the data were used to determine the differences in teaching behaviors between the control and the treatment teachers. The mean percentage of behaviors for the major CAFIAS parameters, CAFIAS variables, and predominant interaction patterns were compared to aid in the decision making.

Summary

Twenty-six physical education student teachers enrolled in either the 1985 fall or 1986 spring student teaching practicum at Ithaca College, Ithaca, New York served as subjects. The subjects were divided into two groups: those who had received conventional supervisory feedback as part of O'Brien's (1985) study (control group), and those who had received systematic supervisory feedback as part of O'Brien's study (treatment group).

Each subject was videotaped on three separate occasions while teaching his/her regularly scheduled classes.

The 78 videotaped sessions, 39 from each group, were then coded by an expert coder, Dr. Victor H. Mancini, using CAFIAS. The data for analysis were collected from the videotapes, and the codings were then computer analyzed to determine the percentages of the major CAFIAS parameters and predominate interaction patterns. Descriptive statistics were calculated, and visual comparisons were made to determine the relative standings of both groups on each CAFIAS variable.

Chapter 4

ANALYSIS OF DATA

Presented in this chapter are the results that were found when comparing the teacher behaviors and interaction patterns of the control group of student teachers and the treatment group of student teachers. CAFIAS was used to measure the behavior and interaction patterns between the teacher and his/her students. This chapter has been divided into the following sections: (a) coder reliability, (b) analysis of behaviors and interaction patterns, and (c) summary.

Coder Reliability

In order to determine the reliability of the coder for this investigation one videotape from the control group of teachers and one videotape from the treatment group of teachers were randomly selected from 78 tapes. Each tape was coded during two independent observation sessions. The top 10 cells were ranked and the Spearman rank-order correlation was applied to the rankings. Stability-reliability for the CAFIAS coding was established at .97, indicating that the coder, Dr. Victor H. Mancini, was reliable.

Analysis of Behaviors and Interaction Patterns

Table 1 indicates the percentage of the major CAFIAS parameters for both the control group of teachers and the treatment group of teachers. The treatment group of teachers exhibited more questioning to the students (TTQR), using questions 16.2% of the time as opposed to 5.4% by the control group. One of the most significant differences found between the groups was in the area of teachers' use of acceptance and praise (TTAPR) which occurred 71.1% of the time for the

Table 1

Use of Major CAFIAS Parameters by the Control and Treatment Teachers

CAFIAS Parameters	Control Group	Treatment Group
Total Teacher Contribution (TTC)	50.1	49.1
Total Student Contribution (TSC)	36.2	37.8
Total Silence and/or Confusion (SC)	13.7	13.1
Total Teacher Use of Questions (TTQR)	5.4	16.2
Total Teacher Use of Acceptance and Praise (TTAPR)	26.5	71.1
Total Student Initiation, Teacher Suggested (TSITSR)	56.3	80.1
Total Student Initiation, Student Suggested (TSISSR)	4.2	7.5
Content Emphasis, Teacher Input (CETI)	38.2	34.1
Teacher as Teacher (TT)	99.9	99.7
Other Student as Teacher (ST)	0.0	0.3
Environment as Teacher (ET)	0.0	0.0
Verbal Emphasis (VE)	50.1	47.9
Nonverbal Emphasis (NVE)	49.9	52.1
Class Structure as One (W)	96.5	91.1
Class Structure as Part (P)	3.5	8.9
Teacher Empathy to Students' Emotions (TE)	0.1	0.1

treatment group compared to 26.5% of the time for the control group, reflecting a difference of 44.5%. This would indicate that the treatment group of teachers exhibited a greater amount of praise and acceptance of their students' efforts and ideas.

Students in the treatment teachers' classes tended to exhibit more student-initiated behavior, with a significant difference found in the teacher-suggested category (TSITSR). Students in the treatment teachers' classes initiated behavior through teacher suggestion 80.1% of the time, and the control group students exhibited this behavior only 56.3% of the time. The difference was only moderate with regards to student-initiated behavior, student-suggested (TSISSR); the treatment group exhibited this type of behavior 7.5% of the time compared to 4.2% by the control group. A moderate degree of difference occurred between the groups in the area of content emphasis-teacher input (CETI); in this instance, the control group teachers exhibited this behavior 38.2% compared to 34.1% of the time for the treatment group, representing a difference of 4.1%. The teachers in the control group gave slightly more verbal (VE) information to their students, 50.1% to 47.9%, and the treatment group teachers utilized slightly more nonverbal information (NVE), 52.1% to 49.1%, compared to the control group. The control group teachers favored teaching their classes as one unit (W); this was done nearly the entire time or 96.5%. The treatment group, while still teaching the majority of the time as one unit (91.1%), did incorporate the use of small groups and individual work (P) 8.9% of the time as compared to 3.5% of the time by the control group, for a difference of 5.4%. Only minimal differences occurred in the areas of total teacher contribution (TTC), total student contributions (TSC), total

silence and confusion or student-to-student interaction (SC), and teacher empathy to students' emotions (TE).

Table 2 shows the predominant interaction patterns for both the control group of teachers and the treatment group of teachers. This shows the most predominant sequences in which behaviors occurred throughout the classes. The predominant interaction pattern for both groups was the extended student-to-student interpretive drills, scrimmage, or game playing (8-10-8). This pattern occurred 22.7% of the time in the treatment group and 19.5% of the time in the control group. The next most predominant interaction pattern for the control group was extended teacher information-giving (5-5). This pattern occurred 16.9% of the time compared to only 7.6% of the time for the treatment group. Another frequent pattern for the control group was teacher information-giving followed by teacher direction followed by student predictable response followed by more teacher directions (5-6-8-6). This pattern occurred 15.5% of the time or nearly three times as often as the treatment group teachers who displayed this pattern 5.6% of the time. Extended student-to-student predictable response (8-10-8) and teacher direction followed by student predictable response followed by more teacher direction (6-8-6) were also frequent patterns exhibited by the control group of teachers.

The second highest pattern exhibited by the treatment group was student interpretive behavior followed by teacher acceptance followed by further interpretive behavior by the student (8-3-8). This pattern occurred 10.7% of the time compared to only 1.4% of the time in the control group. Teacher information-giving followed by student interpretive behavior followed by further information-

Table 2

Summary of the Most Frequent CAFIAS Interaction Patterns and Percentages of Occurrence Between Control and Treatment Teachers

Control Group		Treatment Group	
Interaction patterns	Percentage	Interaction Patterns	Percentage
8\10-8\	19.5	8\10-8\	22.7
5-5	16.9	8\3-8\	10.7
5-6-8-6	15.5	5-8\5	8.7
8-10-8	7.5	5-5	7.6
6-8\6	6.4	8\2-8\	5.8
5-8\5	5.6	5-6-8-6	5.6
5-8-5	5.4	6-8\6	3.8
8\3-8\	1.4	8-10-8	3.2
8\2-8\	1.4	4-8\4	2.5
4-8-4	1.3	4-8-4	2.2

(table continues)

Interaction Pattern Description

- 8\10-8\ Extended student-to-student interpretive drills, scrimmage, or game playing.
- 8\3-8\ Student interpretive behaviors followed by teacher acceptance followed by further interpretive behavior.
- 5-5 Extended teacher information-giving.
- 5-8\5 Teacher information-giving followed by student interpretive behavior followed by further information-giving.
- 8\2-8\ Student interpretive behavior followed by teacher praise followed by more student interpretive behavior.
- 5-6-8-6 Teacher information-giving followed by teacher direction followed by student predictable response followed by more teacher direction.
- 6-8\6 Teacher direction followed by student predictable response followed by more teacher direction.
- 8-10-8 Extended student-to-student predictable response.
- 5-8-5 Teacher information-giving followed by student predictable response followed by further teacher information-giving.
- 4-8\4 Teacher question followed by student interpretive behavior followed by further teacher question.
- 4-8-4 Teacher question followed by student predictable response followed by further teacher question.

giving (5-8-5), extended teacher information-giving (5-5), and student interpretive behavior followed by teacher praise followed by more student interpretive behavior (8-2-8) were also frequent patterns exhibited by the treatment teachers' classes.

Table 3 shows the percentage of occurrence of the major CAFIAS variables for both the control group of teachers and the treatment group of teachers. The CAFIAS variable that occurred the greatest percentage of the time for the control group was teacher information-giving (5); this took place 26.1% of the time. Interpretive student response (8), predictable student response (8), and silence/confusion or student-to-student interaction (10/20) were the next most frequently occurring CAFIAS variables, occurring 19.5%, 15.8%, and 13.7% of the time, respectively.

Within the treatment group the CAFIAS variable that occurred the greatest percentage of the time was interpretive student response (8); this took place 28.1% of the time. Teacher information-giving (5), silence/confusion or student-to-student interaction (10/20), and teacher use of acceptance (3) were the next most frequently occurring CAFIAS variables.

Summary

In order to determine coder reliability for this study, one videotape was randomly selected from the 39 control group tapes and one videotape was randomly selected from the 39 treatment group tapes. Each tape was coded using CAFIAS during two independent observation sessions by Dr. Víctor H. Mancini, an expert coder of CAFIAS. The top 10 cells were ranked and then subjected to the Spearman rank-order correlation technique. The mean correlation of .97 was

Table 3

Percentage of Occurrence of Major CAFIAS Variables

CAFIAS Variables	Control Group	Treatment Group
Teacher Use of Praise (2)	3.1	8.2
Teacher Use of Acceptance (3)	2.9	11.7
Teacher Information-Giving (5)	26.1	17.5
Teacher Directions (6)	13.6	6.6
Teacher Criticism (7)	3.0	1.5
Predictable Student Response (8)	15.8	7.5
Interpretive Student Response (8\)	19.5	28.1
Student Initiated Behavior (9)	0.8	2.3
Silence/Confusion or student-to- student interactions (10/20)	13.7	13.1

Note. These calculations were based on 35,136 behaviors for the control group and 41,474 behaviors for the treatment group.

sufficient to indicate that the coder was reliable.

Analysis of the use of major CAFIAS parameters (see table 1) revealed total student initiation, teacher suggested (TSITSR), total teacher use of questions (TTQR), total teacher use of acceptance and praise (TTAPR), and total student initiation, student suggested (TSISSR) were used more frequently by the treatment group teachers compared to the control group teachers. Content emphasis, teacher-input (CETI) and verbal emphasis (VE) occurred more frequently with the control group teachers. The control group preferred to teach the class as a whole unit (W), whereas the treatment group utilized both whole (W) and part unit (P) teaching structures. The control group had less student-suggested student-initiated behaviors (TSISSR) and considerably less teacher-suggested student-initiated behaviors (TSITSR). In addition, the control group used a significantly less amount of teacher acceptance and praise (TTAPR).

The most frequent interaction pattern (see table 2) for both the control and treatment groups was extended student-to-student interpretive drills, scrimmage, or game playing (8\10-8\). The next frequent interaction pattern for the treatment group was student interpretive behavior followed by teacher acceptance followed by further interpretive behavior (8\3-8\). Also predominant for the treatment group was teacher information-giving followed by student interpretive behavior followed by further information-giving (5-8\5). The next most predominant interaction pattern for the control group was extended teacher information giving (5-5). This pattern was followed closely by teacher information-giving followed by teacher direction followed by student predictable response followed by more teacher directions (5-6-8-6).

The most frequently occurring CAFIAS variable (see table 3) for the treatment group of teachers was interpretive student response (8) followed by teacher information-giving (5). The highest occurring CAFIAS variables for the control group of teachers were teacher information-giving (5) and interpretive student response (8).

The results and subsequent analysis of the CAFIAS data led to the rejection of the major hypothesis that there would be no significant differences in behaviors between those teachers who received systematic supervisory feedback through ALT-PE as part of O'Brien's study (treatment group) and those teachers who received only conventional supervisory feedback as part of O'Brien's study (control group), as measured by CAFIAS. The results indicate that differences between the control and treatment groups of teachers do indeed exist. The treatment group teachers used considerably more praise and acceptance of students' ideas and efforts; they asked more questions and provided for more student-initiated behaviors. The control group teachers were more critical of their students' ideas and efforts and spent significantly more time giving directions that produced predictable student responses. Analysis of the data indicates that the changes in teachers' behaviors produced by systematic supervisory feedback were sustained even 1 year after the cessation of training.

Chapter 5

DISCUSSION OF RESULTS

The purpose of this investigation was to study the lasting effects of instruction in and supervision through ALT-PE on the teaching behaviors of physical education student teachers. CAFIAS was the instrument used to identify teacher and student behaviors and interaction patterns. An overview of the results of this study and a comparison of these results with the findings of other related studies relative to the effects of systematic supervisory feedback on teaching behaviors using CAFIAS and ALT-PE, and their lasting effects, will be discussed. A summary of results is also provided.

Analysis of the use of CAFIAS parameters (see table 1) for both the treatment group of teachers and the control group of teachers showed significant differences between the groups in several areas. The greatest difference between groups occurred in the area of teacher use of acceptance and praise (TTAPR). The treatment group teachers exhibited over twice the amount of acceptance and praise of students' efforts and ideas as compared to the control group. Student-initiated behavior was also significantly greater in the treatment group as evidenced by the high incidence of student-initiated behavior, teacher suggested (TSITSR) and student-initiated behavior, student suggested (TSISSR). A considerable difference was also found in the area of class structure; the control group teachers taught almost exclusively to the class as a one unit (W), whereas the treatment group teachers utilized individual and small group instruction (P) to a much greater degree.

The most frequent interaction patterns of the treatment and control group teachers (see table 2) yielded information as to the sequence of behaviors and the percentage of their occurrence. Extended student-to-student interpretive drills, scrimmage or game playing (8-10-8) was the highest occurring interaction pattern for both groups, occurring 22.7% of the time in the treatment group compared to 19.5% of the time for the control group teachers. It is at this point that the similarities between the groups end. Although both groups highest occurring interaction pattern was interpretive drills, scrimmage, or game playing, it was the sequence of interaction patterns that led up to this pattern and the pattern that followed that produced the differences between groups. The control group teachers next two most frequently occurring patterns involved the use of information. They gave information in an extended manner (5-5) as well as information preceding directions leading to a predictable student response followed by further directions (5-6-8-6). In contrast, the treatment group teachers next most frequent pattern involved student interpretive behaviors followed by acceptance followed by further interpretive behaviors (8-3-8).

A number of behaviors and interactions were characteristic of the treatment group of teachers. Their students received significantly more praise and acceptance of their efforts and ideas as compared to those students in the control group. They asked more questions of their students and utilized more individual and small group instruction. Their students had more interpretive responses and more initiated behaviors than those students in the control group. The control group teachers were more traditional in their approach to teaching. They spent a good deal of their time giving directions and information that led to predictable responses by their

students. The control group teachers were more critical of their students' ideas and efforts and spent nearly the whole time teaching to the class as one unit. The descriptive data provided from this study indicates that differences do exist, with regards to teacher behavior, between those student teachers who received instruction in and supervision through ALT-PE (treatment group) and those student teachers who received only conventional supervisory feedback (control group).

CAFIAS has often been used as a research tool and as part of a teacher preparation program for physical education majors. In addition, several researchers have used CAFIAS as an intervention in studies involving the effects of instruction and supervision in IA on teaching behaviors. In this study, however, CAFIAS was not used as the intervention but solely to describe the effects of ALT-PE on teachers' behaviors. Direct comparison of this present study, which used ALT-PE as the instrument for intervention, to these studies is not possible. However, since CAFIAS was used to measure teacher and student behavior and interaction patterns in this study, some similarities to other CAFIAS studies can be discussed. Keilty (1975) investigated the effects of 15 hours of instruction and supervision in CAFIAS on teacher effectiveness. The findings showed no significant difference for teacher behaviors or teacher effectiveness as a result of the training, unlike this investigation where considerable differences were recorded.

The findings of this study are congruent with those of Hendrickson (1975) who used CAFIAS to train pre-service physical educators during micro-peer teaching. Control and treatment groups were assigned. The treatment group received instruction in and feedback through CAFIAS and the control group received only conventional feedback. The findings revealed that those pre-service

teachers from the treatment group used more teacher praise and acceptance, asked more questions, and used more individual and small group instruction. Rochester (1976) also used instruction in and supervision through CAFIAS on pre-service teachers. She established that those student teachers who received additional CAFIAS coding experience in addition to the CAFIAS feedback asked more questions of their students, talked less, and had more student-initiated behavior. These findings are in accordance with this investigation. Teachers in the treatment group asked more questions and had more student-initiated behaviors, both teacher- and student-suggested.

Vogel (1976) studied the effects of instruction and supervision in CAFIAS on physical education student teachers. He found that those student teachers who received systematic supervisory feedback in CAFIAS used more acceptance and praise, asked more questions, and permitted more verbal and nonverbal student-initiated behaviors. These results are similar to the findings of this investigation.

The results of this study are in accordance with the findings of Stevens (1980) who investigated the effects of instruction and supervision in CAFIAS on teaching behaviors. The data revealed that the treatment group teachers showed an increase in praise, acceptance, questioning, and student interpretive behavior. The effects of feedback and interpretations of CAFIAS on the attitudes and teaching behaviors of physical education students were investigated by Inturrisi (1979). Treatment and control groups were assigned relative to the type of feedback each subject received. The treatment group received additional systematic supervision through CAFIAS, and the control group received only conventional type feedback. Teacher attitudes were assessed using the TSRT. Results showed that those student teachers who

received feedback and interpretation in CAFIAS had more positive teaching behaviors and attitudes than those student teachers in the control group who received only conventional supervisory feedback.

Several researchers have used ALT-PE to provide teachers with systematic supervisory feedback. In this investigation ALT-PE was used as intervention while CAFIAS was used to describe teachers' behaviors. Direct comparison of this present study which combined the use of ALT-PE and CAFIAS to these studies which used ALT-PE is not possible. However, since ALT-PE was used as the intervention in this study, some similarities to other ALT-PE studies can be discussed. The effects of different interventions and forms of feedback on students' ALT-PE were studied by several researchers. O'Brien (1985) investigated the effects of instruction in and supervision through ALT-PE on the relationship between perceived and observed students' behaviors in classes taught by pre-service physical education teachers. The TQSA was used to record the perceived students' behaviors. Treatment and control groups were assigned, with the control group receiving conventional feedback and the treatment group received instruction in and supervision through ALT-PE. It was concluded that pre-service physical educators who were instructed in and supervised through ALT-PE were significantly more accurate in estimating observed students' behaviors. These teachers also had students who accrued more ALT-PE than those students in the classes taught by the control group teachers. This appears to be similar to the findings of this study. In this study, the control group teachers spent considerably more time giving directions and information, students spent more time waiting, were less active, and had less opportunity to accrue ALT-PE.

The findings of this study are in accordance with the findings of Griffin (1986) who investigated the effects of conventional supervisory feedback and systematic supervisory feedback received through ALT-PE. Control and treatment groups were randomly assigned, with the control group receiving conventional feedback and the treatment group receiving systematic supervisory feedback in ALT-PE. The findings revealed that students of teachers in the treatment group accrued more ALT-PE, spent less time in transition and management behaviors and more time in game play. Students of teachers in the control group spent more time waiting around inactive than those students in the treatment group. The teachers in the treatment group were more effective and provided more opportunities for their students to be actively involved in class.

The use of ALT-PE and CAFIAS to gather data to provide systematic supervisory feedback has been used in a number of studies in the past. Only a few researchers have investigated whether the changes in teachers' and students' behaviors produced by systematic supervisory feedback are specific to the instrument used.

Mancini et al. (1983) conducted a study to assess the effects of instruction and supervision in CAFIAS on the ALT-PE of high-burnout secondary physical education teachers. Treatment and control groups were assigned, with the control group receiving conventional supervisory feedback and the treatment group receiving instruction, supervision, and feedback in CAFIAS. Students in the control group exhibited an increase in accrued ALT-PE from 21% to 26%, while the treatment group students saw an increase in accrued ALT-PE from 27% to 46%. As a result; it was determined that systematic supervisory feedback using

CAFIAS can modify teachers' and students' behaviors and can also have an effect on the accrued ALT-PE.

In a study that mirrors the procedures used in this investigation, Grecic et al. (1984) investigated the lasting effects of training in CAFIAS on the ALT-PE of students taught by in-service physical educators. As was the case in this study, the subjects in their study had participated in a previous intervention study during undergraduate training. Assignment of subjects to control and treatment was based on what type of supervisory feedback each had received during teacher training. The findings revealed that treatment group students were more actively involved in class and accrued nearly twice as much ALT-PE, 40.1% compared to 21.3% for the control group students. They concluded that the instruction and supervision in CAFIAS was responsible for the significant differences observed in the accrued ALT-PE. In addition, it was determined that the effects of instruction and supervision in CAFIAS on student ALT-PE were maintained 1 to 4 years after cessation of the training period. Their findings are congruent with the findings of this investigation which revealed significant differences in teacher behaviors as a result of the systematic supervisory feedback using ALT-PE received during undergraduate training. It was determined in this investigation that these effects on teachers' behaviors were maintained 1 year after cessation of the training period.

Although numerous researchers have compared the effects of conventional and systematic supervisory feedback, only a few researchers have conducted follow-up investigations to determine whether the effects are long-lasting. Getty (1977) found that teachers who have systematic supervisory feedback in CAFIAS asked more questions of their students, used more acceptance and praise of

students' ideas and efforts, and allowed more student-initiated behavior compared to teachers who received conventional supervisory feedback. In addition, he determined that these effects on teaching behaviors from instruction and supervision in CAFIAS could be maintained 1 month after training had ended. Mancini et al. (1979) used the TPCQ on the same set of subjects to study the lasting effects of instruction and supervision in CAFIAS. They found that the treatment group subjects scored higher on the TPCQ than those subjects in the control group. Teacher effectiveness could also be maintained over a 1-month period.

The findings of this study are in accordance with the findings of Mancini et al. (1982) who investigated the lasting effects of instruction and supervision in CAFIAS on teaching behaviors, effectiveness, and attitudes of in-service physical educators up to 4 years following cessation of training. They found that teachers who received systematic supervisory feedback in CAFIAS during teacher training were more indirect in their teaching style and made more use of verbal and nonverbal acceptance praise and questioning in their classes than those teachers who received only conventional supervisory feedback during teacher training. In addition it was concluded that these effects could be maintained 1 to 4 years after the cessation of training in CAFIAS.

The findings of this study are congruent with those of Higgins (1991) who investigated the lasting effects of instruction and supervision through ALT-PE on the relationship between perceived and observed behaviors of physical education student teachers and their students. Twenty-six physical education student teachers, who had earlier participated in a study by O'Brien served as subjects. The assignment of control and treatment groups was based on the type of supervisory

feedback they had received as part of O'Brien's study. From the findings it was concluded that those student teachers who received instruction and supervision through ALT-PE had students who accrued more ALT-PE than those students whose teachers only received conventional supervisory feedback. In addition, it was concluded that the effects of instruction and supervision through ALT-PE were still maintained up to 1 year following cessation of training.

This present study was a follow-up to O'Brien's (1985) to determine the lasting effects of instruction in and supervision through ALT-PE on the teaching behaviors, as measured by CAFIAS, of physical education student teachers. The teachers who received instruction in and supervision through ALT-PE used more praise and acceptance of students' ideas and efforts, asked more questions of their students, encouraged more student-initiated behaviors, both teacher-suggested and student-suggested, and used more individual and small group class structures.

The findings from this investigation provide information in two areas that are substantiated by previous studies. Evidence suggests that the use of systematic supervisory feedback through CAFIAS or ALT-PE can produce a number of positive changes in teachers' and students' behaviors, not necessarily specific to the instrument used, resulting in a more effective and productive learning environment. Secondly, these positive behavior modifications produced from systematic supervisory feedback through CAFIAS or ALT-PE are long-lasting. The results of this investigation support the inclusion of ALT-PE and CAFIAS instruction and supervision in the undergraduate teacher training curriculum. Since the effects of systematic supervisory feedback were long-lasting, it would indicate that the use of

ALT-PE and CAFIAS feedback has the potential to assist pre-service teachers to be more effective in-service teachers.

Summary

Significant differences were found in teacher behaviors between those student teachers who received instruction in and supervision through ALT-PE (treatment group) and those student teachers who received only conventional supervisory feedback (control group). This led to the rejection of the major hypothesis which stated that there would be no significant difference in the behaviors of student teachers who received instruction in and supervision through ALT-PE and those student teachers who did not receive instruction in and supervision through ALT-PE.

The effects of instruction and supervision in ALT-PE were similar to a number of intervention and feedback studies that involved CAFIAS. The findings of this study closely resemble those of Hendrickson (1975), Inturrisi (1979), Rochester (1976), Stevens (1980), and Vogel (1976). They determined that the process of receiving systematic supervisory feedback was found to be effective in bringing about desired changes in teachers' and students' behaviors. Teachers who received systematic supervisory feedback through CAFIAS used a greater amount of praise and acceptance of students' ideas and efforts, asked more questions of their students, had less teacher talk, had more student-initiated behavior, used more individual and small group instruction, and had more student-to-student interpretive behavior than those teachers that received only conventional supervisory feedback.

The findings relative to the effects of instruction and supervisory feedback in ALT-PE were similar to those of O'Brien (1985) and Griffin (1986). These

researchers concluded that as a result of systematic feedback through ALT-PE teachers' and students' behaviors can be modified and more desirable behaviors produced. Teachers who had received ALT-PE feedback were found to be more accurate in estimating students' behaviors, spend less time in transition and managerial behavior, and provide more opportunity for accrued ALT-PE for their students than those teachers who received only conventional feedback.

Only a few researchers have addressed the question of whether or not the effects of systematic supervisory feedback are specific to the behaviors targeted by the instrument or produced a multitude of changes in teachers' and students' behaviors. More specifically, and relative to this and other related investigations, can systematic supervisory feedback using ALT-PE produce changes in teachers' and students' behaviors that are measurable using CAFIAS or, conversely, can systematic supervisory feedback using CAFIAS produce changes in students' involvement that are measurable by ALT-PE? Grecic et al. (1984), Mancini et al. (1983), and this researcher have sought answers to these questions. The results from these investigations indicate that the use of systematic supervisory feedback does indeed produce desirable changes in teacher and student behaviors, beyond those changes specific to the instrument. Grecic et al. (1984) and Mancini et al. (1983) revealed that teachers that received systematic supervisory feedback through CAFIAS had students who were more actively involved in class and accrued more ALT-PE than those students whose teachers received only conventional feedback. This investigation revealed that systematic supervisory feedback through ALT-PE produced desirable changes in student teachers' behaviors. They used significantly more praise and acceptance of students' ideas and efforts, more questions, and

allowed for more student-initiated behaviors than those student teachers who received only conventional feedback.

This investigation's findings coincide with past studies that investigated the lasting effects of systematic supervisory feedback. Getty (1977) and Mancini et al. (1979) showed that the effects of systematic supervisory feedback on teaching behaviors and teacher effectiveness could be maintained 1 month after cessation of training. Higgins (1991) showed that the effects of instruction and supervision in ALT-PE could be maintained 1 year following cessation of training. Mancini et al. (1982) showed that these effects could be maintained up to 4 years after cessation of training.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

This study was conducted to determine the lasting effects of instruction and supervision in CAFIAS on student teachers' behaviors and interactions with their students. The 26 student teachers selected for inclusion in this study participated in O'Brien's investigation in 1985. She investigated the effects of instruction in and supervision through ALT-PE on the relationship between perceived and observed students' behaviors in classes taught by pre-service physical educators. She concluded that pre-service physical educators instructed in and supervised through ALT-PE were significantly more accurate in estimating observed students' behaviors. She also concluded that pre-service physical educators instructed in and supervised through ALT-PE had students who accrued more ALT-PE than those students in the classes taught by teachers who received only conventional supervisory feedback. The subjects were divided into two groups for this study: those who had received conventional supervisory feedback were placed in the control group and those who had received systematic supervisory feedback were placed in the treatment group.

Data for analysis were collected from three videotapes made of each teacher while teaching their regularly scheduled classes. Using CAFIAS the videotapes were then coded to describe the teacher-student interactions and behaviors occurring

in each class. The CAFIAS codings were computer analyzed. Percentages were determined for the major CAFIAS parameters, predominant interaction patterns, and behaviors. Descriptive statistics were calculated, and visual comparisons were made to determine the relative standings of both groups on each CAFIAS variable.

Analysis of the major CAFIAS parameters revealed that total teacher use of acceptance and praise (TTAPR) and teacher use of questions (TTQR) occurred to a greater degree in the treatment teachers' classes. Students in the treatment teachers' classes exhibited more student initiated behaviors, both teacher-suggested (TSITSR) and student-suggested (TSISSR). The treatment group teachers utilized more group and individual structure (P) in their classes as opposed to the near exclusive use of the whole unit (W) teaching structure employed by the control group teachers. The control group teachers were more critical of their students' ideas and efforts (7). They spent considerably more time giving directions (6), nearly twice as much time as the treatment group teachers (13.6% compared to 6.6%). They also provided for significantly less student interpretive type responses (8) than the treatment teachers (19.5% compared to 28.1%).

The predominant interaction pattern for both the control and treatment groups was extended student-to-student interpretive drills, scrimmage, or game play (8-10-8). The next most frequent occurring interaction pattern for the treatment group was student interpretive behavior followed by teacher acceptance followed by further interpretive behavior (8-3-8); whereas, extended teacher information-giving (5-5) was the next most predominant interaction pattern for the control group.

Analysis of the individual CAFIAS variables revealed that the treatment group teachers provided for more student interpretive responses, were more inclined to accept students' ideas, were more supporting of the students' efforts, and asked more questions of their students. The control group teachers were more traditional in their teaching style. They spent more time talking which resulted in less activity for their students. The information and directions that they gave produced predictable type responses from their students in contrast to the higher percentage of student interpretive responses found in the treatment group teachers' students.

These findings led to the rejection of the major hypothesis that stated that there would be no significant difference in the behaviors of student teachers who received instruction in and supervision through ALT-PE and those student teachers who received only conventional supervisory feedback.

Conclusions

The results of this study led to the following conclusions regarding the lasting effects of instruction and supervision in ALT-PE on teachers' behaviors and interactions with students as measured by CAFIAS:

1. The teaching behaviors of the treatment group of teachers and the control group of teachers differed significantly. The treatment group of teachers gave more praise and acceptance of students' ideas and efforts, asked more questions of their students, and provided for more interpretive student response than the control group teachers. The control group teachers were more critical of their students ideas and efforts and spent more time giving directions and information than those teachers in the treatment group.

2. The effects of instruction in and supervision through ALT-PE were still maintained up to 1 year following cessation of training

Recommendations for Further Study

The following recommendations were made for further study:

1. A study of the long-term effects of instruction in and supervision through ALT-PE on different teacher subgroups, such as male and female, elementary and secondary, and by years of experience.

2. A follow-up study using the same subjects in this study to determine if the long-term effects of instruction in and supervision through ALT-PE are maintained beyond the year following training.

Appendix A

INFORMED CONSENT FORM:

STUDENT TEACHER COPY

1. Purpose. Research is being conducted to investigate the lasting effects of instruction and supervision in Academic Learning Time on student teachers' behaviors and interactions with students in their classes. The student teachers selected for inclusion in this investigation participated in a study last year where they received instruction and supervision in ALT-PE while viewing the videotapes of their micro-peer teaching. The results of the investigation revealed that those pre-service teachers who had received instruction and supervision in ALT-PE were significantly more aware of their behaviors and interactions with their students. This study is being conducted to determine whether the effects of systematic supervisory feedback on teachers' behaviors and interactions are long lasting by videotaping the subject 1 year after their training during their student teaching experience. The videotapes will be coded using the Cheffers' Adaptation of Flanders' Interaction Analysis System instrument.

Benefits. With the resulting information student teachers may hopefully become more aware of their behaviors and interactions with their students. Secondly, the information gained from this study will help evaluate the efficacy of providing pre-service teachers with systematic supervisory feedback, such as ALT-PE, as part of their professional preparation program by studying the effects of such feedback 1 year later during their student teaching experience.

2. Method. As a subject, you will be asked to participate in the following manner:
Permit the researcher, Stuart L. Dean, to videotape three of your classes. During this time, the only thing you will be asked to do is to wear a small wireless microphone. Each videotape will later be coded using the CAFIAS instrument.

3. Will this hurt? There are no apparent physical or psychological risks involved in participating in this study. At no time will your normal actions as a teacher be affected by the videotaping. The coding instrument which will be used is nonevaluative. The instrument describes the behaviors and interaction patterns occurring between teacher and pupil.

4. Need more information? If you wish to know more information about the study, please feel free to contact Stuart L. Dean or Dr. Victor H. Mancini at 274-3109 at Ithaca College.

5. Withdrawal from the study. Participation is voluntary, and your agreement to participate does not prevent you from discontinuing your participation at any time.

6. Will the data be maintained in confidence? Yes. It is assured that the names and schools in this study will be kept in the strictest confidence. Videotaping is solely for the purpose of this study and will be available only to the researchers, Stuart L. Dean and Dr. Victor H. Mancini, and the student teacher involved. When the study is completed, the tapes will be erased.

7. I have read the above and I understand its contents. I agree to participate in this study. I acknowledge that I am 18 years of age or older.

Thank you.

Signature

Stuart L. Dean
Graduate Student

Dr. Victor H. Mancini
Advisor-Ithaca College

Date

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