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# The effects of instruction in and supervision through Academic Learning Time- Physical Education on the relationship between perceived and observed students' behavior

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THE EFFECTS OF INSTRUCTION IN AND SUPERVISION THROUGH ACADEMIC  
LEARNING TIME-PHYSICAL EDUCATION ON THE RELATIONSHIP  
BETWEEN PERCEIVED AND OBSERVED STUDENTS' BEHAVIORS

by

Deborah Mae O'Brien

An Abstract

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

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## ABSTRACT

The effects of instruction in and supervision through Academic Learning Time-Physical Education (ALT-PE) on the relationship between perceived and observed students' behaviors in classes taught by pre-service physical educators were investigated. The subjects for the study were 30 secondary methods students enrolled at Ithaca College, Ithaca, New York. Each subject was videotaped on three separate occasions while teaching in a micro-peer setting. The three tapes that were made of each subject were coded using the ALT-PE instrument. Prior to every videotaped class and immediately following these classes, each subject filled out the Teacher's Questionnaire of the Students' Activities (TQSA). This instrument was used to record the perceived students' behavior. Subjects in both the treatment and control group received conventional feedback while viewing their films. In addition, the subjects in the treatment group received instruction in and supervision through ALT-PE while viewing their films. The subjects in the treatment group were also shown a comparison of their post-class estimates from the TQSA and the observed scores from ALT-PE. The third videotape was used along with the subject's post-class estimate of the TQSA for analysis. In the treatment group, significant canonical correlations were found for all the variables in the context level and learner involvement level. A one-tailed Fisher's  $z$  test was then performed on all the variables. This led to the rejection of the first hypothesis that there would be no

significant difference between the relationship of perceived and observed students' behaviors of those pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not. Multivariate analysis of variance was used to determine significant differences in the teaching behaviors between the groups. This led to the rejection of the second hypothesis that there would be no significant difference between the accrued ALT-PE of those students engaged in classes taught by pre-service physical educators who received ALT-PE feedback and those who did not receive the ALT-PE feedback. Univariate analysis of variance was performed on each of the ALT-PE variables to identify those variables that accounted for a significant amount of between-group difference. The variable which accounted for the between-group difference in the context level was transition/management, and in the learner involvement level the variables that accounted for the between-group difference were waiting, on-task, cognitive, and motor appropriate (ALT-PE). From the findings 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. It was 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 class whose teachers only received conventional feedback.

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A Thesis Presented to the Faculty of  
the School of Health, Physical  
Education, and Recreation  
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In Partial Fulfillment of the  
Requirements for the Degree  
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## DEDICATION

This thesis is dedicated to Mae and Leo O'Brien, my parents, for loving, caring, and giving me everything while never asking for anything in return.

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## Chapter 1

### INTRODUCTION

In an effort to improve teacher effectiveness, teachers have been provided with information on their teaching behaviors. In the past, subjective data from the principal and conventional feedback were used. This subjective feedback was unreliable and not valid as a measure of teaching behaviors. A problem in education was to find a technique that provided teachers with the needed objective feedback. One solution to the problem had been to put a trained observer into the classroom to record behaviors for the teacher's consideration and possible improvement (Squires, 1975).

Now, supervisory feedback that provides objective data to modify behaviors and increase effectiveness is available to the teacher. One tool that provides this supervisory objective feedback is interaction analysis. Various researchers have used interaction analysis as a feedback device. Getty (1977), Hendrickson (1975), Rochester (1976), and Vogel (1976) all used interaction analysis and studied its effects on teachers' behaviors. These researchers found the use of interaction analysis facilitated changes in teachers' behavior. Getty (1977) and Mancini, Frye, and Quinn (1982) investigated the lasting effects of interaction analysis training. Getty observed that the effects of interaction analysis were still evident 1-month post-training, while Mancini et al. (1982) observed the maintenance of its effects

up to 4 years following the training period.

Another observation instrument that provides teachers with information about their class is Academic Learning Time-Physical Education (ALT-PE). In a few short years, time-on-task research in physical education, known as ALT-PE, has made tremendous strides and provided valuable data for extending our knowledge base about teaching, learning, and teacher education (Rife & Dodds, 1983). The relationship between ALT and student achievement provides empirical support for the idea that student learning can be observed directly and immediately in the classroom. ALT-PE is directly related to student achievement which the teacher's behavior influences indirectly (Powell & Filby, 1983).

The ALT-PE instrument has been used by many researchers to determine the amount of ALT-PE accrued in various settings. The ALT-PE instrument has also been used in intervention and feedback studies to gather information to provide feedback. Birdwell (1980), Hart (1983), Metzler (1980b), Paese (1982), and Whaley (1980) all investigated the value of different interventions and forms of feedback on teaching. Birdwell studied how instruction and daily feedback can alter the ALT-PE of students. The results showed an increase in ALT-PE was attained by the students who were given the feedback and instruction. Paese (1982) investigated the effect of feedback given to two student teachers on their students' ALT-PE (Motor). Verbal and written feedback was found to be a valuable supervisory tool in helping student teachers improve

instructional performance and in increasing their pupils' achievement.

Giving teachers feedback will aid in increasing their effectiveness and awareness, since it was found that teachers are not aware of what actually occurs in the classroom (Good & Brophy, 1973; Martin & Keller, 1976; Withall, 1972). Beam (1972) investigated the effects of training in interpretation of classroom analysis with or without feedback on 33 science student teachers' displayed, perceived, and ideal teaching behaviors. It was found that teachers who were trained in the interpretation of classroom interaction analysis tended to reduce the difference between their displayed and ideal classroom behaviors, as well as their displayed and perceived behaviors. The teachers who received training in interaction analysis but received no feedback tended to increase the differences in displayed and perceived behaviors and their displayed and ideal classroom behaviors.

Withall (1972) found that 85% of the teachers from nursery through graduate school had little awareness of their behaviors or what effect it had on their students. Batchelder (1976) observed 25 elementary teachers who taught English, math, and physical education. She found that physical education teachers were inaccurate in 94% of their estimates of their process objectives, followed by English teachers with 84% and math teachers with 77%.

Van der Mars, Mancini, and Frye (1981) investigated the effects of instruction in and supervision through systematic

supervisory feedback on the relationship between perceived and observed teaching behaviors of 36 pre-service physical educators.

It was found that the subjects who received the systematic supervisory training were more indirect in their teaching and were more accurate in estimating their behaviors.

This study examined whether ALT-PE feedback can help teachers to estimate their students' behavior more accurately. As in the study by van der Mars et al. (1981), this study also investigated the relationship between perceived and observed behaviors of pre-service teachers. In addition, this study was designed to determine if ALT-PE feedback to teachers will increase their students' engaged time.

#### Scope of the Problem

This investigation was conducted to determine the effects of instruction in and supervision through ALT-PE on the relationship between perceived teaching behaviors and the observed teaching behaviors of pre-service physical educators. The subjects for the study were 30 secondary methods students enrolled at Ithaca College, Ithaca, New York. Each subject was videotaped on three separate occasions while teaching in a micro-peer setting. The first two videotapes of each subject were used as part of the treatment phase of the study for both the treatment and control groups; whereas, the third tape was used for data analysis. The teaching sessions were 10 minutes. The tapes made were coded using the revised ALT-PE instrument (Siedentop, Tousignant, & Parker, 1982). Each

subject filled out the Teacher's Questionnaire of the Students' Activities (TQSA) prior to and again immediately following the class.

The subjects in the control group viewed their film and received conventional feedback for the analysis of their lessons. The subjects in the treatment group viewed their films and received instruction and feedback in ALT-PE, in addition to the conventional feedback in analyzing their lessons. During the feedback sessions, the treatment group teachers were also shown a comparison of their estimated percentages from the TQSA and their observed percentages obtained from the ALT-PE results.

#### Statement of Problem

This investigation was conducted to study 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.

This study was also conducted to determine if there was any significant difference in the accrued ALT-PE of students engaged in classes taught by pre-service physical educators who received instruction and supervision through ALT-PE and those who did not receive feedback in ALT-PE.

#### Major Hypotheses

1. There will be no significant difference between the relationship of perceived and observed teaching behaviors of those pre-service physical educators who received instruction in and



supervision through ALT-PE and those who did not receive instruction in and supervision through ALT-PE.

2. There will be no significant difference between the accrued ALT-PE of students engaged in classes taught by pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not receive instruction through ALT-PE.

#### Assumptions of Study

The following assumptions were made relative to this study:

1. The subjects selected were representative of the population of pre-service physical education majors at Ithaca College.

2. The coding of three micro-peer teaching situations using ALT-PE was adequate to yield valid data on the observed teaching behavior for each subject.

3. The Teacher's Questionnaire on the Students' Activities provided valid data on the perceived behavior of the subjects.

#### Definition of Terms

The following terms were operationally defined for the purpose of this study:

1. Academic Learning Time (ALT) is the amount of time a student spends engaged in a relevant learning task with a high success rate (Marliave, Fisher, & Dishaw, 1972).

2. Academic Learning Time in Physical Education (ALT-PE) is the amount of academic learning time accrued by a student while in

a physical education class (Metzler, 1980b).

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

4. Conventional supervisory feedback is verbal input based on aspects of class control, organization, and management; class structure; and methodology (Mancini, Wuest, & van der Mars, 1984).

5. 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., 1984).

6. Micro-peer teaching is a method of instruction in teacher education which enables pre-service teachers to practice teaching skills by teaching their classmates (van der Mars, 1979).

7. Teacher's Questionnaire on Students' Activities (TQSA) is a 15-item questionnaire derived from the ALT-PE categories.

8. Perceived teaching behavior is the estimated teaching behavior of the teacher in the classroom as measured by the TQSA.

#### Delimitations of Study

The following were the delimitations of this study:

1. The subjects were secondary methods students enrolled in Curriculum and Methods in Secondary Physical Education, a course at Ithaca College, Ithaca, New York.

2. ALT-PE was the only instrument employed to record actual

student behavior.

3. The TQSA was the only instrument used in this study to record the teaching behaviors as perceived by the subjects.

4. All subjects taught their activities in a micro-peer situation.

#### Limitations of Study

The following were the limitations of this study:

1. The findings related to the observed student behavior may only be valid for comparison when the ALT-PE instrument is used for coding.

2. The findings related to the perceived teaching behaviors may only be valid for comparison when the TQSA is used for data collection.

3. The findings of this study should not be generalized beyond pre-service physical education teachers at Ithaca College.

## Chapter 2

### REVIEW OF RELATED LITERATURE

The review of related literature relevant to this study will focus on the following areas: (a) the use of feedback to modify teacher behavior, (b) Academic Learning Time-Physical Education, (c) teacher awareness in the classroom, and (d) summary.

#### The Use of Feedback to Modify

##### Teacher Behavior

Providing teachers with information on their teaching behaviors has been used as a means to modify and change their behaviors. In the past, conventional verbal feedback that only focused on aspects of class management, control, and methodology was used. Presently systematic supervisory feedback, which provides immediate objective descriptions of the class events, has become popular.

One means to provide teachers with systematic supervisory feedback is through the use of interaction analysis. Interaction analysis instruments focus on teachers' and students' interactions and give an event-by-event description of what happens in the class. Flanders' Interaction Analysis System (FIAS) (Flanders, 1960) and its modifications have been used frequently by researchers to investigate the effects of instruction and/or supervision in FIAS on teachers' behaviors. One study conducted by Love and Barry (1971) used the Timer-Love Adaptation of FIAS to investigate

the difference between those teachers trained using the instrument and those not trained. Results showed the student teachers who were trained in the system were able to analyze their own behavior, and were willing and had the ability to change their own behavior. Bondi (1970) also used FIAS to provide teachers in the treatment group with feedback from matrices and information sheets, while the control group received conventional feedback. The student teachers who received the systematic supervisory feedback were more indirect in their teaching, gave more praise, asked more questions, and accepted and clarified students' ideas more.

The Cheffers' Adaptation of FIAS (CAFIAS) has been used as a research tool in several studies to provide teachers with supervisory feedback and also as a means to assess its effects on teachers' behavior. Keilty (1975) investigated the effects of instruction and supervision in CAFIAS on the pre-service physical educators teaching in a micro-peer setting. The Teacher Performance Criteria Questionnaire (TPCQ) was used to assess teacher effectiveness. No significant difference for teachers' behavior or teacher effectiveness was reported. However, the teachers with the CAFIAS training were more indirect in their teaching style.

CAFIAS was also used by both Hendrickson (1975) and Rochester (1976) as the training instrument for pre-service teachers. In both studies the control and treatment groups received conventional supervisory feedback; in addition, the treatment group

subjects received instruction and feedback from CAFIAS. Hendrickson found the subjects who received supervisory feedback were more indirect in their teaching, were more student-oriented, accepted and praised students' ideas more, asked more questions, and used more individual and small group instruction. In Rochester's study, both the treatment and control groups received instruction and supervision in CAFIAS, but the treatment group also received training in the coding of CAFIAS. The treatment group had less teacher talk, more teacher questioning, and more student-initiated behavior occurring in their classes.

The effect of systematic supervisory feedback on student teachers was investigated by Vogel (1976) and by Getty (1977). The subjects in Vogel's study received 10 hours of training while the subjects in Getty's study received 15 hours of CAFIAS training. In both studies the results indicated the subjects given systematic supervisory feedback were more indirect in their teaching style, used more praise, and made better use of questions. In Getty's study the differences that were observed in the student teachers' behavior following training were still evident 1 month after the ending of the training period with no additional training. With the same set of subjects Mancini, Morris, and Getty (1979) used the TPCQ to determine the lasting effects of instruction and supervision in CAFIAS on teacher effectiveness. They found that the treatment group subjects scored higher on the TPCQ than the control group subjects and that teacher effectiveness could be

maintained 1 month after the training had ended.

Inturrisi (1979) investigated the effects of feedback and instruction in interaction analysis on the teaching behaviors and attitudes of student teachers. A significant difference in teacher use of questioning, pupil initiation, and acceptance and praise were observed, in favor of the teachers in the treatment group. Based on the results of the Teacher Situation Reaction Test (TSRT), the student teachers exposed to CAFIAS showed more positive teaching attitudes than the control group.

Mancini, Frye, and Quinn (1982) investigated the effects of interaction analysis up to 4 years post-training on 26 in-service teachers' behaviors, attitudes, and effectiveness. The teachers who were trained in CAFIAS as undergraduates were more indirect in their teaching, used more questions, and accepted and praised students more than those who received conventional supervisory feedback. The teachers with the interaction analysis training were also more effective and had a more positive attitude. The study concluded that the effects of interaction analysis training could be maintained 1 to 4 years post-training.

Grecic, Mancini, and Wuest (1984) employed the same subjects who were used in Quinn's study to investigate the lasting effects of training in interaction analysis on the students' Academic Learning Time-Physical Education (ALT-PE) during classes taught by in-service physical educators. The results revealed that the subjects trained in interaction analysis as undergraduates were

more efficient teachers and had greater student involvement in their classes. The students in their classes had twice as much ALT-PE as the control group students (40.1% compared to 21.3%).

Interaction analysis training was shown to increase teachers' effectiveness. Like interaction analysis, the ALT-PE instrument can also be used as a tool to increase teacher effectiveness.

#### Academic Learning Time-Physical Education

To understand Academic Learning Time-Physical Education (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 influential factors in creating favorable learning environments. In 1972 the Far West Laboratory for Educational Research and Development began a major research effort to identify the important teaching skills which are related to student learning. This effort came to be known as BTES.

As a consequence of the BTES studies, Berliner (1979) advocated the use of time-on-task for a product measure of actual achievement. The concept of time-on-task became known as Academic Learning Time (ALT) and was defined as the amount of time a student spends engaged in a relevant learning task with a high success rate (Marliave, 1976). ALT was used initially to monitor both teacher and student behavior.

The ALT model consists of four interrelated components measuring student achievement: allocated time (the time provided



for learning a task), engaged time (the percentage of allocated time students spent actively responding), task relevancy (the degree to which an activity can be viewed as contributing to an academic goal), and success rate (the amount of success experienced by the student for the engaged task) (Marliave, 1977). The BTES theory that ALT was significantly related to students' achievement received strong support from researchers (Berliner, 1978; Marliave, 1979; Ortiz, 1980).

In an effort to adapt this approach to physical education, the BTES model of ALT was modified by Siedentop, Birdwell, and Metzler in 1979. In this modification, ALT-PE was defined as the amount of time a student spends engaged in a relevant motor task at an easy level of difficulty (Siedentop et al., 1979).

The intent of ALT-PE was to observe participation levels of physical education students in respect to the context of the class and the difficulty of the activity. This initial system consisted of four major decisions: setting (instructional style), content (general or physical education-related), learner moves (engaged or non-engaged), and level of difficulty (easy or not easy). A 12-second interval recording format was used: the coder observed for 6 seconds, then recorded for 6 seconds.

The original ALT-PE was revised by Siedentop, Tousignant, and Parker in 1982 to make the instrument easier to use. The revised ALT-PE system consisted of only two major decision levels (context level and learner involvement) compared to the four in version I.

In version II there was no setting category to reflect the spectrum of teaching styles, but the inclusion of general content and subject matter motor makes possible a clearer picture of what the students are doing. Version II included a number of other changes; the warm-up category was added, non-academic instruction and other motor responses were deleted, and the learner moves grouping (engaged and not engaged) became motor engaged and not motor engaged. In version II student behavior was observed and recorded during each interval of observation, while in version I, if for example a content general category were coded in tier 2, no individual students were coded for learner moves and for level of difficulty. Version I and II both provide similar information about students' opportunities to learn physical activity skills. Also both versions are quite compatible with each other in terms of translating data from I to II (Rife, Shute, & Dodds, 1985).

Metzler (1980b) used the ALT-PE instrument to discover the amount of ALT accrued in a variety of physical education settings. Twenty-one physical educators teaching at the elementary, junior high, and high school levels were used in the study. A total of 32 classes were observed in 13 different activities, with two or three target students observed in each class. Descriptive statistics showed that students were involved in PE-Content 73.6% of the class time. ALT-PE occurred 26.8% of all class intervals, and ALT-PE(M) 7.5% of all intervals. Both ALT-PE(M) and ALT-PE were the highest at the elementary level, followed by the junior

high and high school level, respectively.

Metzler (1980a) used the same data to examine the levels of ALT-PE accrued by students in each of the 13 physical education settings. Results revealed the highest mean percentages were found in volleyball (59.4%) and soccer (40.3%); the lowest were found in football (14.1%) and gymnastics (12.3%). Students engaged in team activities tended to accrue more ALT-PE than did students engaged in individual activities. In addition, Metzler found that the ALT-PE did not increase as the teaching unit progressed.

The ALT-PE of college students was also examined by Metzler (1981). He found 45% of all coded intervals were ALT-PE, nearly twice the amount of ALT-PE exhibited in the 1-12th grade study. This indicated a substantially higher level of involvement on the part of the college students.

The amount of ALT-PE experienced by students in 30 elementary and 31 secondary physical education classes was investigated by Godbout, Brunelle, and Tousignant (1983). Content-PE time accounted for 65.7% of the class time in the elementary classes and 81.1% in the secondary classes. ALT-PE averaged 36.4% in the secondary classes and 31.3% of the class time in the elementary classes.

The differences in learning opportunities in traditional elementary physical education classes were investigated by Placek, Silverman, Shute, Dodds, and Rife (1982). ALT-PE percentages were derived for three classifications; high-, medium-,

and low-skilled students; girls and boys; and for different instructional units. The results revealed no significant difference in the ALT-PE accrued by girls and boys. High-skilled students accrued 15% ALT-PE(M) while the medium-skilled accrued 9% and the low-skilled accrued 8%. Shute, Dodds, Placek, Rife, and Silverman (1982) examined the differences in learning opportunities in elementary movement classes. Differences in ALT-PE between boys and girls, special and non-special need groups, and skill level were examined. Shute et al. found that equal opportunities existed for the different skill levels, for special need groups, and for boys and girls.

A comparison of the ALT-PE of regular and mainstreamed handicapped elementary students was undertaken by Aufderheide, McKenzie, and Knowles (1982). The teachers employed were identified as either users or nonusers of individual instruction. Findings indicated that users of individualized instruction provided a significantly greater amount of ALT-PE for their students, whether they were mainstreamed or regular. Students engaged in classes taught by teachers using individualized instruction were engaged 57.2% of class time compared with 48.94% for students of nonusers of individualized instruction.

McKenzie (1980) investigated the effects of publicly posting skill achievement on the ALT-PE of 5-to 7 year-old swimmers. Results showed all swimmers had an increase in total engaged time during the public posting of achievement. The two target swimmers

raised their ALT-PE(M) from 13.5% to 25.8% and from 8% to 20.8%. Additionally, two disruptive children were observed, and the effects of using time-out procedures on their behavior and their ALT-PE were examined. During the baseline period, one boy averaged 25.5% of time in disruptive behavior. During the intervention period, the boy's rate of disruptive behavior fell to 6.3%; however, when baseline conditions were reinstated, his disruptive behavior rose slightly to 11.6%.

The ALT-PE of students when different instructional strategies were utilized by their teachers has also been studied. During beginning fencing classes six instructional strategies were assessed by McKenzie, Clark, and McKenzie (1982). All the classes were taught by the same experienced teacher. ALT-PE(M) accrued during active learning periods ranged from 26.9% for bouting to 97.95% for machine-paced drilling. Feedback ranged from 18.7% for teacher-paced drilling compared with 54.8% for student-paced drilling. McKenzie et al. concluded that teaching strategies that maintain high levels of ALT-PE and allow more feedback were valuable.

Experimental Teaching Units (ETU) as a means of measuring ALT-PE was utilized by Young (1981) and Keller (1982). Both studies used a novel skill, in this instance a combined golf/hockey skill which involved hitting a ball into a hoop, in an effort to reduce the influence of prior learning. Young's study employed a pre-test, followed by a 20-minute lesson in which the content was

regulated but not the instructional style. After the lesson a post-test was given. Pre-test and post-test scores showed higher post-test scores correlated with increased ALT-PE, indicating student mastery of the ETU skill. Keller (1982) investigated the effects of two instructional methods, the lecture/demonstration and reverse chaining, on student achievement scores and whether student achievement can be indicated by ALT-PE(M). The findings showed no significant differences in the ALT-PE accrued by students taught by either the lecture/demonstration or reverse chaining instructional method.

A number of researchers examined the value of different interventions and forms of feedback on teaching. One of the initial studies that investigated the effects of feedback on ALT-PE of students was conducted by Whaley (1980). Twelve students taught by experienced teachers at four schools were observed daily for 7 weeks. Both teachers and students were made aware that more engaged time and motor response were desirable; however, the ways of achieving this was not shown. Graphic feedback was given to both teachers and students. The results indicated that feedback and daily monitoring had no effect on ALT-PE.

Birdwell (1980) studied the effects of instruction and daily feedback given to three in-service teachers on the ALT-PE of their students. The teachers attended a clinic and were made aware that changes in management and feedback were desirable and received instruction on how to attain it. Results showed ALT-PE increased

from 34.7% to 57.3% and ALT-PE(M) from 17.5% to 37.7%.

Metzler (1981) assessed the value of interventions to increase ALT-PE. Three students and a student teacher from each of the 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.

The effects of modification of teacher behavior on the ALT of selected students in physical education was investigated by Hart (1983). Four physical education teachers in elementary schools were trained as observers to collect data with the ALT-PE instrument. The teachers then measured their students' ALT-PE. Then the teachers attended short instructional clinics, were given daily systematic feedback, and were given a pre-set criterion level to meet. The relationship between the intervention and the behaviors at each school was examined. The intervention resulted in reducing student wait time and transition time and increasing the ALT-PE in three out of the four schools.

Paese (1982) investigated the effects of a university supervisor's feedback on the ALT-PE(M) of two student teachers' volleyball classes. The intervention used was verbal and written feedback, which consisted of information from the data collected from the ALT-PE instrument and strategies on how to reduce management time. ALT-PE was found to be a valuable supervisory tool

in helping student teachers improve instructional performance and in helping student teachers increase their pupils' achievement.

#### Teacher Awareness in the Classroom

Teachers' perceptions of what happens in the classroom and what actually occurs in the classroom are not always the same. Bondi (1970) stated how aware the teachers are of their own behavior and that of their students has been assumed to be related to the effectiveness of their teaching. The teachers who are aware of their behaviors are able to facilitate more learning in their class.

The analysis of various aspects of the teaching-learning environment has resulted in the development of a number of systematic observations techniques. The instruments provide teachers with feedback concerning the frequency and type of interactions with the students. "An assumption underlying this use of observation techniques is that teachers are unaware of certain aspects of their behavior in the classroom" (Martin & Keller, 1976, p. 47).

Withall (1972) found that 85% of the teachers from nursery through graduate school had little awareness of their behavior or what affect it had on their students. In an attempt to determine the reasons why teachers apparently lack awareness Good and Brophy (1973) summed up three factors:

1. The interaction in the classroom takes place at a rapid pace.



2. The teachers have not been trained to monitor and study their own behavior.

3. Teachers rarely receive systematic feedback from supervisors.

These three factors which hinder teachers' abilities to perceive the class activities hold true particularly in physical education.

From the CAFIAS categories Batchelder (1976) developed the Teachers Questionnaire on Objectives (TQO). She observed 25 elementary teachers who taught English, math, and physical education. Each teacher filled out the TQO for 3 areas (pupil interaction, class structure, and variety of teaching agency) before they taught their classes. Two reliable observers coded the classroom interactions. After comparing the TQO to the observed teachers' classroom behaviors, she found only one of the 17 objectives that were observed to be significantly correlated (pupil initiation, teacher suggested ratio). Physical education teachers were inaccurate in 94% of the estimates of their process objectives; whereas, English teachers were inaccurate in 84% and math teachers in 79%.

CAFIAS and a modified version of the TQO was employed by Scriber (1977) to investigate 16 school health educators on the relationship between perceived teaching behavior and observed teaching behavior. The TQO was filled out by the teachers before and again after teaching. The results indicated four of the 20 variables studied were significantly related. The conclusion was

that school health educators' perceptions of the class behaviors were different than the actual observed behaviors.

Martin and Keller (1976) studied 30 classrooms with each classroom being observed for 1 day to observe dyadic interactions between the teachers and the students. The teachers were told the amount of contacts they had with individual students and were asked to estimate the percentages that were in each of the five categories (response opportunities, recitation and reading, procedural contact, work contacts, and behavior contacts). Results revealed teachers were unable to accurately estimate the number of contacts in each category.

Beam (1972) investigated 33 science teachers' displayed, perceived, and ideal teaching behaviors to determine the effects of training in IA. The subjects were divided into three groups who received training in IA in conjunction with videotape feedback, training in the interpretation of IA, and no training. Each teacher was asked to fill out a questionnaire concerning his/her intended teaching behaviors (ideal behaviors) and those behaviors actually used (perceived behaviors). The displayed behaviors were assessed by FIAS. The student teachers who received videotape feedback plus IA tended to reduce the difference between their displayed and ideal behaviors and between their displayed and perceived behaviors. The group of subjects that only received the training in the interpretation of interaction analysis tended to increase the differences in both cases. The control group subjects

showed no differences.

Van der Mars, Mancini, and Frye (1981) investigated the effects of instruction in and supervision through interaction analysis on the relationship between perceived and observed teaching behaviors of 36 pre-service physical educators. Prior to and immediately following teaching, the teachers filled out the TQO. The control and treatment groups received conventional feedback; in addition, the treatment group received feedback through CAFIAS. The treatment group also were shown a comparison of their questionnaire to their observed scores from CAFIAS. The subjects who received the systematic supervisory feedback were more indirect in their teaching style and were better able to make accurate estimates of their class behaviors.

#### Summary

Research showed that training in interaction analysis had an immediate effect on the teachers' behaviors and that the effect was still maintained up to 4 years after the training by Getty (1977), Grecic et al. (1984), and Mancini et al. (1982). Therefore, interaction analysis is a valuable tool in the teacher training program and in modifying teachers' behaviors.

Recent research showed that increased involvement or attention to the learning tasks increases learning. The BTES used time-on-task, specifically ALT, for a product measure of actual achievement (Berliner, 1979). Siedentop et al. (1979) modified ALT for use in the physical education setting; this became known

as ALT-PE. Then, Siedentop et al. (1982) revised the ALT-PE instrument for easier use. Many researchers have used ALT-PE in the teaching environment to determine the amount of ALT-PE accrued by students. The effects of interventions and feedback on ALT-PE have been studied by Birdwell (1980), Hart (1983), Metzler (1981a), Paese (1982), and Whaley (1980).

Teachers' perceptions of the classroom events and the actual classroom behaviors are not always the same (Batchelder, 1976; Good & Brophy, 1973; Martin & Keller, 1976; Whittall, 1972). Interaction analysis training and feedback were found to decrease the difference between perceived classroom behaviors and observed classroom behaviors by Beam (1972) and van der Mars et al. (1981).

## Chapter 3

### METHODS AND PROCEDURES

This chapter describes the methods and procedures used in this investigation. Included is selection of subjects, testing instruments, treatment of subjects, procedure, methods of data collection, scoring of data, treatment of data, and summary.

#### Selection of Subjects

The subjects for this investigation were 30 randomly selected junior physical education majors enrolled in either the 1984 fall or 1985 spring semester class of Curriculum and Methods in Secondary Physical Education at Ithaca College, Ithaca, New York. The subjects were assigned to either the treatment group or the control group by a flip of a coin.

#### Testing Instruments

The revised Academic Learning Time-Physical Education (ALT-PE) (Siedentop et al., 1982) observation instrument was used to code the amount of time students spend working directly on meaningful learning tasks. Version II, the revised version, consists of two major decision levels. The context level focuses on the class as a whole and is divided into general content, subject matter motor, and subject matter knowledge. There were 13 categories within the context level. The second level, learner involvement level, looked at the individual students in the class. It consisted of two subdivisions (not motor engaged and motor engaged), and it had

eight further categories. The recording format used was 6-seconds observe, 6-seconds record.

The second instrument used in this study was the Teacher's Questionnaire on the Students' Activities (TQSA). It was necessary to develop the questionnaire in order to compare the teachers' perception of the class events to the observed students' behaviors as measured by ALT-PE. The questionnaire was modeled after Batchelder's (1976) Teacher Questionnaire on Objectives (TQO). The researcher used the ALT-PE, version II categories as a basis to develop the instrument's questions (Siedentop et al., 1982).

The first draft of the TQSA was discussed with the members of the researcher's thesis committee, and revisions were made. After the changes were made, the second draft was presented to the Analysis of Teaching and Coaching Behaviors graduate class at Ithaca College, Ithaca, New York. The graduate students were familiar with ALT-PE version I (Siedentop, Birdwell, & Metzler, 1979) and version II (Siedentop et al., 1982). The graduate students gave oral responses and interpretations for each question to determine clarity. The thesis committee also evaluated the questionnaire.

Based upon the recommendations of the thesis committee and the graduate students, the instrument was further modified. Once the questionnaire was revised it was again presented to the graduate students for evaluation. The revised version was also shown to three experts in the use of ALT-PE. Lastly, the TQSA was

given to the students enrolled in secondary methods at Ithaca College, Ithaca, New York, to determine if they fully understood each question and the directions. The final revision is presented in Appendix A.

#### Intraobserver Agreement

Intraobserver agreement (IOA) was assessed using the scored-interval agreement method, as recommended by Hawkins and Dotson (1973). During two independent coding sessions, four randomly selected videotapes were coded by Dr. Victor Mancini, an expert in descriptive-analytic techniques. IOA was calculated on an interval-by-interval basis and was computed by dividing the number of intervals on which there was agreement by the number of agreements plus disagreements and then multiplying the results by 100 (Herson & Barlow, 1976). The formula is given below:

$$\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ of agreement or IOA.}$$

When both coding sheets showed the target behavior as occurring during the interval, agreement was recorded. When the behavior recorded during the same interval did not concur for both coding sheets, it was determined to be in disagreement.

#### Treatment of Subjects

All subjects involved in this investigation were each videotaped on three separate occasions while teaching a 10-minute lesson in a micro-peer setting. The first and second videotape of each subject served as part of the treatment phase of the study for

control and treatment groups. The third videotape was used for data analysis.

Each subject received instructions on how to fill out the TQSA before each subject's first teaching experience and received additional information while filling out post-class estimates immediately following the videotaped class. The questionnaire was filled out prior to each subject's teaching and also immediately following each class for each subject's teaching.

Subjects in both treatment and control groups received conventional supervisory feedback while viewing their films. This feedback focused on class control, organization, use of equipment, and methodology. In addition to the conventional supervisory feedback, the subjects in the treatment group received information on ALT-PE categories, explanation of their results from the ALT-PE coding, and comparison of their post-class estimates to their actual percentages in ALT-PE categories.

#### Procedures

Each subject was videotaped three times throughout the semester while teaching in a micro-peer setting. The length of each teaching session was 10 minutes. The activity taught and the type of style were the teacher's choice.

The subjects in both groups were asked to fill out the TQSA before and again after their teaching. Detailed instructions were given to all subjects on the content of the questionnaire.

As part of the treatment phase, the control group received



only conventional supervisory feedback while viewing their videotapes. In addition to the conventional feedback, the subjects in the treatment group received instruction and feedback in ALT-PE. Also, the treatment group teachers were shown a comparison of their estimated percentages from the questionnaire to their actual observed percentages from the ALT-PE categories during the treatment phase.

#### Methods of Data Collection

The third videotape made on every subject served as data for the analysis. The videotapes were coded by an expert coder using ALT-PE. The TQSA was filled out by each subject before the teaching session and again after the teaching. Only the post-class estimates were used for analysis.

#### Scoring of Data

Data collected from the coding of ALT-PE were hand scored and transposed into percentages for the 21 variables identified by the ALT-PE instrument. Percentages were also tabulated for the questions on the TQSA, so a comparison of the percentages was possible.

#### Treatment of Data

To determine the relationship between the perceived percentages recorded on the TQSA and the observed percentages recorded through ALT-PE, canonical correlations were performed on the four variables from the context level (transition/management, technique, break, and subject-matter motor) and on the five

variables from the learner involvement level (waiting, on task, cognitive, motor engaged, and motor supporting) for both the treatment and control groups. Fisher's  $z$  test for two independent correlations was used to indicate significant difference between the treatment and control groups on each of the correlations for the categories of variables.

Multivariate analysis of variance (MANOVA) was performed to determine whether differences in teaching behaviors as identified by ALT-PE existed between the treatment and control groups. The percent that each variable contributed to the significant difference was calculated using discriminant function analysis. An univariate analysis of variance (ANOVA) was then used to identify which of the ALT-PE variables independently contributed to significant differences between the two groups. For all tests the .05 level of significance was set prior to the data collection.

#### Summary

The subjects who served in this study were 30 junior physical education majors who were randomly assigned to either the treatment or control group. The subjects in the treatment and control groups received conventional feedback while viewing their videotaped classes. In addition, the treatment group subjects received instruction and supervision through ALT-PE. All subjects filled out the TQSA pre-teaching and again post-teaching. Only the post-class estimates were used for data. The first two teaching sessions served as the treatment phase while the third

tape of each subject was used for data. The observed teaching behaviors were coded by an expert coder using ALT-PE. The data collected were hand scored and transposed into percentages.

Canonical correlations were used to determine the relationship between perceived percentages from the TQSA and observed percentages recorded through ALT-PE for both the treatment and control groups. MANOVA was performed to determine significant differences in the pre-service teachers' behaviors of the treatment and control groups. Then, a discriminant function analysis was utilized to determine the percent that each variable contributed to the significant difference. ANOVA was then executed to identify which of the ALT-PE variables, when independently identified, contributed significantly to any difference between the groups.

## Chapter 4

### ANALYSIS OF DATA

The effects of instruction in and supervision through Academic Learning Time-Physical Education (ALT-PE) on the relationship between perceived students' behaviors and observed students' behaviors in classes taught by pre-service physical educators were studied. Thirty secondary methods students enrolled at Ithaca College, Ithaca, New York, participated in this study.

This chapter presents the results of the statistical analysis of the data in the following four sections: (a) intraobserver agreement, (b) relationship between perceived and observed students' behaviors, (c) differences in students' behaviors, and (d) summary.

#### Intraobserver Agreement

Intraobserver agreement (IOA) scores were computed using the scored-interval method (Hawkins & Dotson, 1973). Four randomly selected videotapes, two from the control group and two from the treatment group, were coded during two independent coding sessions by Dr. Victor H. Mancini, an expert in descriptive-analytic studies. To determine reliability for each of the categories of the ALT-PE recording instrument the number of agreements was divided by agreements and disagreements and multiplied by 100 (Herson & Barlow, 1976). IOA scores ranged from 94.7% to 100% which were sufficient to indicate the coder was reliable.

Relationship Between Perceived and  
Observed Students' Behaviors

In order to assess the relationship between the variables from the Teacher's Questionnaire on Students' Activities (TQSA) and the corresponding percentages for both the treatment group and the control group, the canonical correlation technique was used. The canonical correlation technique was chosen since it is a multivariate type of comparison, and each question had multiple responses. At the context level and the learner involvement level for the treatment group, all variables showed significant correlations. The results for the control group showed no significant correlations for either the context level or the learner involvement level. The results are shown on Table 1 and Table 2.

Correlation coefficients were computed for each of the ALT-PE variables at the context level and the learner involvement level. For the control group, the amount of variance shared by the perceived and observed scores at the context level ranged from .01% (transition/management) to 19.23% (technique) (see Table 3). For the treatment group, the shared variance between the perceived and the observed scores at the context level ranged from 77.61% (break) to 99.25% (technique). At the learner involvement level, for the control group the amount of shared variance ranged from .29% (motor appropriate) to 21.89% (cognitive) (see Table 4). For the treatment group, shared variance ranged from 87.61% (on-task) to 99.68% (motor appropriate).

Table 1

Analysis of Canonical Correlations on the Relationship Between  
Perceived and Observed Students' Behaviors at the Context Level

Variables	Eigenvalue	Canonical Correlation	Chi-square	df	Significance
Treatment Group ( <u>n</u> = 15)					
1	.99570	.99778	146.42151	16	.000
2	.99034	.99516	94.94427	9	.000
3	.97206	.98593	50.86179	4	.000
4	.83076	.91144	16.87441	1	.000
Control Group ( <u>n</u> = 15)					
1	.61683	.78538	12.70071	16	.695
2	.22925	.47880	3.58767	9	.936
3	.09158	.30263	1.11395	4	.892
4	.02098	.14485	0.20144	1	.652

Table 2

Analysis of Canonical Correlations on the Relationship Between  
Perceived and Observed Students' Behaviors at the Learner  
Involvement Level

Variables	Eigenvalue	Canonical Correlation	Chi-square	df	Significance
Treatment Group ( <u>n</u> = 15)					
1	.99968	.99984	9999.00000	25	.000
2	.99093	.99546	101.31823	16	.000
3	.94239	.97077	61.34145	9	.000
4	.91739	.95781	37.08192	4	.000
5	.84571	.91963	15.88597	1	.000
Control Group ( <u>n</u> = 15)					
1	.77096	.87804	19.25148	25	.785
2	.39857	.63133	6.72369	16	.978
3	.15079	.38831	2.40187	9	.983
4	.09448	.30738	1.01257	4	.908
5	.01968	.14029	0.16896	1	.681

Table 3

Correlation Coefficients for Perceived Versus Observed Scores  
at the Context Level

Variables	Correlation Coefficients	Squared Correlation Coefficients	Shared Variance
Treatment Group ( $\underline{n} = 15$ )			
Transition/Management	.98522	.97065	97.06
Technique	.99624	.99249	99.25
Break	.88098	.77612	77.61
Subject Matter Motor	.99185	.98376	98.38
Control Group ( $\underline{n} = 15$ )			
Transition/Management	.00708	.00005	0.01
Technique	.43857	.19234	19.23
Break	.09231	.00852	0.85
Subject Matter Motor	.37707	.02021	2.02



Table 4

Correlation Coefficients for Perceived Versus Observed Scores  
at the Learner Involvement Level

Variables	Correlation Coefficients	Squared Correlation Coefficients	Shared Variance
Treatment Group ( $\underline{n} = 15$ )			
Waiting	.96778	.93659	93.66
On-Task	.93630	.87609	87.61
Cognitive	.98507	.97036	97.04
Motor Appropriate	.99838	.99676	99.68
Motor Supporting	.99384	.98771	98.77
Control Group ( $\underline{n} = 15$ )			
Waiting	.26414	.06976	6.98
On-Task	.10545	.01111	1.11
Cognitive	.46783	.21886	21.89
Motor Appropriate	-.05379	.00289	0.29
Motor Supporting	.46333	.21467	21.47

A one-tailed Fisher's z test for independent correlations was used to test the first hypothesis that there would be no significant difference between the relationships of perceived and observed students' behaviors of those pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not receive instruction in and supervision through ALT-PE. A z value of 1.96 was needed at the .05 level of significance to reject this hypothesis. The results are shown on Table 5. At the context level, the hypothesis was rejected for all four variables: (a) transition/management, (b) technique, (c) break, and (d) subject matter motor. This hypothesis was also rejected for all the variables in the learner involvement level: (a) waiting, (b) on task, (c) cognitive, (d) motor appropriate, and (e) motor supporting.

#### Differences in Students' Behavior

Multivariate analysis of variance (MANOVA) was performed on 10 variables identified through the use of ALT-PE, five variables from learner involvement level and five variables from context level. In Table 6, the cell means for the treatment and control groups on the 10 variables from the third videotape are presented. The MANOVA procedure resulted in a value of  $F(5,24) = 4.89$ , for the context level, and a value of  $F(5,24) = 17.43$ , for the learner involvement level, which were both significant at the .05 level of significance. The findings of this significant between-group difference led to the rejection of the second hypothesis that there

Table 5

One-tailed Fisher's Z Test for Independent Correlations  
on Differences Between Treatment and Control Group Correlations

Variable	Treatment Group $\frac{z}{r}$	Control Group $\frac{z}{r}$	$\underline{z}$
Context Level			
Transition/Management	2.99	1.06	4.73 *
Technique	2.65	.52	5.20 *
Break	2.09	.32	4.35 *
Subject Matter Motor	1.19	.15	2.55 *
Learner Involvement Level			
Waiting	3.00	1.35	4.00 *
On-Task	2.99	.74	5.51 *
Cognitive	2.09	.41	4.10 *
Motor Appropriate	1.88	.32	3.80 *
Motor Supporting	1.58	.14	3.52 *

\*  $p < .05.$

Table 6

Cell Means for the ALT-PE Variables

Variables	Treatment Group <u>M</u>	Control Group <u>M</u>
Context Level		
Transition/Management	9.80	19.00
Technique	22.53	28.53
Break	0.27	0.73
Skill Practice	52.53	46.07
Scrimmage/Game	12.93	3.67
Learner Involvement Level		
Waiting	2.60	7.80
On-Task	7.60	5.60
Cognitive	28.07	41.00
Motor Appropriate	54.00	31.20
Motor Supporting	6.13	2.60

would be no significant difference between the accrued ALT-PE of students engaged in classes taught by pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not receive instruction in and supervision through ALT-PE.

The discriminant function analysis identified the percentage of contribution to the between-group difference for each of the five context level variables and each of the five learner involvement level variables. These results are shown in Table 7. At the context level, transition/management accounted for 54.83% of the between-group variance. This was followed by technique (5.98%), scrimmage/game (5.12%), break (3.08%), and practice (2.4%). At the learner involvement level, motor appropriate accounted for 34.51% of the variance. This was followed by on-task (21.34%), cognitive (16.3%), waiting (6.65%), and motor supporting (2.11%).

The univariate analysis of variance (ANOVA) on the five variables from the context level and the five variables from the learner involvement level are presented in Table 8. The ANOVA identified the variables that independently contributed to the significant between-group difference. In the context level, transition/management was the only variable to independently contribute to the significant between-group difference. In the learner involvement level four variables independently contributed to the significant between-group difference. These four variables were waiting, cognitive, motor appropriate, and on-task.

Table 6 shows the difference in the mean percentage of

Table 7

Discriminant Function Analysis

Variables	Canonical Coefficients	Squared Canonical Variables	Percent of Contributions
	Context Level		
Transition/Management	.74048	.54831	54.83
Technique	.24461	.05983	5.98
Break	.17566	.03085	3.08
Skill Practice	-.15486	.02398	2.40
Scrimmage/Game	-.22621	.05117	5.12
	Learner Involvement Level		
Waiting	.25782	.06647	6.65
On-Task	.46198	.21342	21.34
Cognitive	.40374	.16300	16.30
Motor Appropriate	-.58745	.34509	34.51
Motor Supporting	-.14516	.02107	2.11

Table 8

Univariate Analysis of Variance Contrasting Treatment  
and Control Groups

Variables	$F^a$	Significance Level
	Context Level	
Transition/Management	15.668	.000
Technique	1.710	.202
Break	0.882	.356
Skill Practice	0.685	.415
Scrimmage/Game	1.46226	.237
	Learner Involvement Level	
Waiting	6.760	.015
On-Task	21.705	.000
Cognitive	16.578	.000
Motor Appropriate	35.097	.000
Motor Supporting	2.143	.154

<sup>a</sup>df = (1,28) for all tests.

occurrence<sup>4</sup> for each of the 10 ALT-PE variables. In the context level, the students in the treatment group teachers' classes had more time in practice and scrimmage/game and less time in transition, technique, and break than the students in the control group teachers' classes. At the learner involvement level, the students in the treatment group teachers' classes had more motor appropriate and motor supporting behavior and had less waiting time, cognitive behavior, and on-task behavior than the students in the classes taught by teachers in the control group.

#### Summary

IOA was established by the scored-interval method using four randomly selected class sessions videotapes which were coded at two different viewings. IOA ranged from 94.7% to 100%.

The canonical correlation technique was performed for the multivariate comparisons on the variables from the TQSA and their related ALT-PE categories to determine the relationship between perceived and observed teaching behaviors in both groups. The treatment group showed significant canonical correlations for all variables in the context level and learner involvement level. In the control group no significant canonical correlations were found. A one-tailed Fisher's  $z$  test for independent correlations was performed on all categories of variables in order to reject the first hypothesis that there would be no significant difference between the relationship between perceived and observed students' behaviors of those pre-service physical educators who received



instruction in and supervision through ALT-PE and those who did not receive instruction in and supervision through ALT-PE. At the .05 level of significance this hypothesis was rejected for all variables in both the context level and learner involvement level.

MANOVA was used to determine whether significant differences existed in the students' behavior between the treatment and control group. The MANOVA procedure resulted in a  $F(5,24) = 4.89$  for the context level, and  $F(95,24) = 17.43$  for the learner involvement level, which were both significant at the .05 level of significance. This led to the rejection of the second hypothesis that there would be no significant difference between the accrued ALT-PE of students engaged in classes taught by pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not receive instruction in ALT-PE. Discriminant function analysis identified the percent of contribution to the between-group difference for each of the ALT-PE variables. In the context level, transition/management accounted for the greatest amount of the variance, 54.83%. In the learner involvement level motor appropriate behavior accounted for 34.51% of the variance.

The ANOVA identified the variables that independently contributed to the significant between-group difference. In the context level, transition/management was the only variable that independently contributed to the significant between-group difference. In the learner involvement level, waiting, on-task, cognitive behavior, and motor appropriate behavior all contributed

to the significant between-group difference.

## Chapter 5

### DISCUSSION OF RESULTS

The purpose of this investigation was to study the effects of instruction in and supervision through Academic Learning Time-Physical Education (ALT-PE) on the relationship between perceived and observed students' behaviors in classes taught by pre-service physical educators. The Teacher's Questionnaire on Students' Activities (TQSA) was used to measure teachers' perceptions of the class events. ALT-PE was used to measure the actual students' behaviors.

This chapter discusses the results of this investigation and compares them with the results of previous studies. The chapter has been divided into four sections. The first section compared and contrasted the results of this investigation with earlier studies on the relationship between perceived and observed students' behaviors. The second section compared the results of this study with those of earlier studies using systematic supervisory feedback. The third section compared the results of this study with other studies using ALT-PE. The fourth section presents a summary of the discussion.

#### Relationship Between Perceived and Observed Teaching Behaviors

Martin and Keller (1976) stated that teachers are unaware of their behaviors in the class. Withall (1972) found that 85% of

the teachers she investigated had little awareness of their behaviors or what affect it had on their students. This past research indicates that awareness of the class events is a problem to most teachers. This investigation also supports the belief that teachers are unaware of the class events. The canonical correlation technique was used to assess the relationship between the variables from the TQSA and their ALT-PE percentages. The control group showed no significant correlations for the learner involvement level or the context level. Correlation coefficients were computed to determine the amount of shared variance by the perceived versus the observed scores. In the control group the shared variance ranged from .01% to 21.89%, in the treatment group the shared variance ranged from 77.61% to 99.68%. This implies that the subjects who did not receive instruction in and supervision through ALT-PE were not aware of their students' behaviors. Receiving supervisory feedback helped the pre-service teachers in the treatment group to be more aware of their behaviors and those of their students.

This present study was the first to use ALT-PE as the observation instrument for data collection and as a supervisory feedback tool. Therefore, direct comparisons are not possible, but certain observations can be made between this study and other studies using systematic supervisory feedback.

Batchelder (1976), in a study involving 25 in-service elementary school teachers, investigated the relationship between

perceived teachers' behaviors and observed teachers' behaviors. Batchelder developed the Teacher Questionnaire on Objectives (TQO) from the CAFIAS categories to measure the perceived teaching behaviors. Out of the 20 variables from CAFIAS, she found only the pupil initiation, teacher-suggested ratio was significantly correlated for the perceived versus observed CAFIAS categories. Scriber (1977) used a modified version of the TQO and CAFIAS to study the relationship between perceived and observed teaching behaviors of 16 school health educators. Similiar to Batchelder's findings, he found that only 4 of the 20 variables were significantly related.

Van der Mars, Mancini, and Frye (1981) also used the TQO and CAFIAS to investigate the effects of instruction in and supervision through interaction analysis on the relationship between perceived and observed teaching behaviors. Like the present study, the investigators used pre-service physical education teachers as their subjects. The researchers found that the subjects who received the systematic supervisory feedback using CAFIAS and who were shown a comparison of their perceived to their observed CAFIAS scores were able to make more accurate estimates of their observed scores. Beam (1972) also found that instruction in interaction analysis and feedback helped to make teachers more aware of their classroom behaviors.

In this investigation, the canonical correlation technique showed that the variables in the context level and learner

involvement level, for the treatment group, were significantly correlated. This indicates that the subjects who received the ALT-PE feedback were better able to predict their behaviors and those experienced by their students. This investigation and that of Beam (1972) and van der Mars et al. (1981) supports the position that teachers who receive systematic supervisory feedback and are shown comparisons of their perceived to observed scores are better able to predict their class behaviors than those without such feedback.

Bondi (1970) implied that teachers' awareness of their behaviors and those of their students is related to the effectiveness of their teaching. Therefore, if one educational goal is to enhance teachers' effectiveness, one way to accomplish this purpose is to provide teachers with systematic supervisory feedback to increase their awareness of the behaviors of themselves and their students.

#### Systematic Supervisory Feedback Studies

In the past, most studies have used Flanders' Interaction Analysis (FIAS) (Flanders, 1960) and its modifications to gather data to provide systematic supervisory feedback. Therefore, direct comparison of the present study which used the ALT-PE instrument to these studies is not possible, but similar findings were observed in a few studies.

Hendrickson (1975) and Rochester (1976) both used the Cheffers' Adaptation of FIAS (CAFIAS) as their observation and feedback tool. Hendrickson found that the subjects who received

instruction in and feedback from CAFIAS were more indirect in their teaching, were more student-oriented, accepted and praised students' ideas more, and asked more questions than those teachers who did not receive instruction and feedback in CAFIAS. Rochester found that subjects with CAFIAS training had less teacher talk, more teacher questioning, and more student-initiated behavior than those teachers who were not supervised using CAFIAS.

Getty (1977), Inturrisi (1979), and Vogel (1976) also used CAFIAS as their observation instrument and feedback tool. Their results supported the findings of Hendrickson (1975) and Rochester (1976). These researchers found that CAFIAS feedback was effective to bring about desired changes in the teachers' behavior. In this study, a multivariate analysis of variance (MANOVA), followed by a discriminant function analysis, and an univariate analysis of variance were performed on the five variables in the learner involvement level and on the five variables in the context level were both significantly different. This showed that the teachers who received instruction in and supervision through ALT-PE designed their instruction to allow students to accrue more ALT-PE than those students who teachers did not receive the ALT-PE feedback. The findings of this study and those of Getty (1977), Hendrickson (1975), Inturrisi (1979), Rochester (1976), and Vogel (1976) support the idea that systematic supervisory feedback can produce desired changes in both the students' behaviors and the teachers' behaviors.

Academic Learning Time-Physical Education Studies

The effects of different interventions and forms of feedback on students' ALT-PE were studied by a number of researchers. Whaley (1980) attempted to increase the engaged time and motor response time of his students by daily feedback. Whaley's findings indicated that the treatment had no significant effect on the ALT-PE of the students. In contrast, this study found the ALT-PE feedback produced a significant difference in the ALT-PE of the students in the classes taught by teachers who received the ALT-PE feedback.

Metzler (1981) investigated the use of interventions to increase students' ALT-PE. He found that a simple intervention of moving archery targets further apart (thus, allowing two students to shoot at the same time) increased motor engaged percentages from 15.4% to 35% and ALT-PE(M) from 11.8% to 29.5%. Hart (1983) investigated the effects of short instructional clinics and daily systematic feedback given to teachers on their students' ALT-PE. The teachers were also trained to collect the ALT-PE data. The intervention resulted in reducing students' wait time and transition time and in increasing the ALT-PE of the students in three out of the four schools investigated.

Birdwell (1980) investigated the effects of instruction and daily feedback given to three in-service teachers on their students' ALT-PE and ALT-PE(M). Both of these categories increased with the feedback. These increases are comparable with the results obtained from Paese's (1982) study. Paese successfully used verbal



and written feedback to increase the students' motor engaged time and their ALT-PE(M).

This investigation also found differences in students' ALT-PE. Students taught by teachers in the treatment group accrued more ALT-PE than students taught by teachers in the control group, 54% versus 31.2%. The students in the treatment group classes also had less waiting time than the students in the control group classes. At the context level, the treatment group students had more time in subject matter motor, 65.46% compared to 49.74% in the control group classes. The discriminant function analysis revealed transition/management contributed the greatest amount to the between-group difference at the context level, and motor appropriate behavior contributed to the greatest between-group difference at the learner involvement level.

The findings of this present study and the findings of Birdwell (1980), Hart (1983), and Paese (1982) all support the contention that interventions and ALT-PE feedback can produce higher engaged time for the students and reduce waiting time. The value of ALT-PE feedback is apparent from these findings. Since the ALT-PE feedback was found to increase engaged time, perhaps ALT-PE training and feedback should be included in teacher training programs. Including ALT-PE training and feedback in undergraduate teacher preparation programs may produce more effective teachers in the future.

Summary

Pre-service physical educators who receive instruction in and supervision through ALT-PE showed a tendency to perceive classroom behaviors significantly more accurately than those teachers who did not receive the ALT-PE feedback. The findings of this study seem to support earlier findings by Beam (1972) and van der Mars et al. (1981) on the effects of instruction in and supervision using systematic observation on teachers' awareness. The findings that teachers in the control group were less aware of their behaviors seem to coincide with results from earlier studies (Batcheler, 1976; Martin & Keller, 1976; Scriber, 1977; Whitall, 1972).

MANOVA followed by discriminant function analysis and univariate analysis of variance resulted in the findings of significant differences between the treatment group and control group. The mean percentages of each ALT-PE variable showed that the students in the treatment group had more motor appropriate behavior (ALT-PE) and less waiting time than the students in the control group classes. These results are in congruence with earlier findings that physical educators who are provided with systematic-supervisory feedback are able to change their behaviors and their students' behaviors (Birdwell, 1980; Getty, 1977; Hart, 1983; Hendrickson, 1975; Rochester, 1976; Vogel, 1976).

The results of this investigation supports the inclusion of ALT-PE instruction and supervision in the undergraduate teacher training curriculum. Pre-service teachers who had received

instruction and supervision in ALT-PE became more aware of their students' behaviors and their students accrued more ALT-PE than those teachers who were not provided with ALT-PE feedback. From the results of this investigation, it appears that the use of ALT-PE feedback has the potential to assist pre-service teachers to be more effective teachers.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

FOR FURTHER STUDY

Summary

The effects of instruction in and supervision through Academic Learning Time-Physical Education (ALT-PE) on the relationship between perceived students' behaviors and observed students' behaviors were studied. The subjects for this investigation were 30 secondary methods students enrolled at Ithaca College, Ithaca, New York. ALT-PE was used as the testing instrument to collect data on the observed students' behaviors. This information provided by ALT-PE was used for feedback to the subjects in the treatment group. The Teacher's Questionnaire on Students' Activities (TQSA) was used to collect data on the perceived students' behaviors.

Each subject was videotaped while teaching in a micro-peer setting three times throughout the semester. Prior to every videotaped class and immediately following these classes each subject filled out the TQSA. The three tapes made for each subject were coded using ALT-PE. Both the control group subjects and the treatment group subjects received conventional supervision while viewing their films. In addition, the treatment group subjects received instruction in and supervision through ALT-PE and were shown a comparison of their estimated scores from the TQSA and the

observed scores from the ALT-PE percentages. For analysis of the data the third videotape of each subject was used, along with the subject's post-class estimates of each of the subjects' third teaching.

The use of the canonical correlation technique for the ALT-PE variables, multivariate in character, resulted in the findings of significant canonical correlations for the treatment group for all the variables in the context level and learner involvement level. No variable in the control group produced a significant correlation. Fisher's  $z$  test for independent observations was used to test the hypothesis that there would be no significant difference between the relationship of perceived and observed teaching behaviors of those pre-service physical educators who received instruction in and supervision through ALT-PE and those that did not receive instruction in and supervision through ALT-PE. The hypothesis was rejected for each variable in the context level and learner involvement level at the .05 level of significance.

Multivariate analysis of variance was used to determine significant differences in the students' behaviors between the treatment and control group. The second hypothesis that there would be no significant difference between the accrued ALT-PE of students engaged in classes taught by pre-service physical educators who received instruction in and supervision through ALT-PE and those who did not receive instruction or feedback in ALT-PE was rejected at the .05 level of significance. Discriminant function

analysis identified the percentages of contribution of each individual variable to the between-group difference. In the context level, the major contributors were transition/management, technique, and scrimmage/game. The major contributors in the learner involvement level were motor appropriate behavior, on-task, and cognitive. In the context level, transition/management was the only variable that independently contributed to the significant between-group difference. In the learner involvement level the four variables that were found to show significant differences between the two groups were waiting, cognitive, motor appropriate behavior, and on-task.

The findings for the treatment group related to the first hypothesis seem to support findings in earlier studies by Beam (1972) and van der Mars et al. (1981) about the effects of instruction in and supervision through systematic supervisory techniques. The subjects who received instruction and supervision using systematic supervisory techniques tended to be significantly more accurate in their estimates of their behaviors and those of their students than those subjects who did not receive instruction and supervision through interaction analysis and ALT-PE.

The findings related to the second hypothesis also coincide with earlier researchers' findings (Birdwell, 1980; Getty, 1977; Hart, 1983; Hendrickson, 1975; Rochester, 1976; Vogel, 1976). Interventions and supervisory feedback can have a positive influence on students' ALT-PE.

### Conclusions

From the findings provided by this investigation the following conclusions were drawn:

1. Pre-service physical educators instructed in and supervised through ALT-PE were significantly more accurate in estimating observed students' behaviors.

2. Pre-service physical educators receiving conventional supervision were not able to accurately perceive students' behaviors.

3. Instruction in and supervision through ALT-PE were found to be beneficial in making pre-service physical educators more aware of their students' behaviors.

4. Pre-service physical educators instructed in and supervised through ALT-PE had students who accrued more ALT-PE than those students whose teachers only received conventional feedback.

### Recommendations for Further Study

The following recommendations are suggested for further study:

1. A study of the effects of instruction in and supervision through ALT-PE on the relationship between perceived and observed students' behaviors using in-service teachers.

2. A study of the effects of the training in the actual use of the ALT-PE instrument on the relationship between perceived and observed students' behaviors and teacher effectiveness.

3. A follow-up study using the same subjects to determine the long term effects of instruction in and supervision through ALT-PE.

Appendix A

TEACHER'S QUESTIONNAIRE ON THE STUDENTS' ACTIVITIES

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

PLEASE FILL IN THE SPACE BESIDE EACH QUESTION WITH ONE OF THE FOLLOWING:

0%, 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%,  
70%, 75%, 80%, 85%, 90%, 95%, 100%

For each of the following questions estimate the percent of class time each of the activities occur. The total for the eight questions should equal 100%. These first eight questions refer to the activities of the whole class.

For questions 1 and 2 the focus is on class time devoted to the general content areas.

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
<p>1. What percentage of class time was devoted to <u>managerial tasks</u>, such as taking roll call, or in transition, such as selecting teams, moving from station to station, changing equipment, or moving out to the playing field?</p>	_____	_____
<p>2. What percentage of class time was spent on warm-up activities such</p>		



## Appendix A (continued)

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
as stretching, calisthenics, or routine exercises?	_____	_____
Questions 3-6 refer to class time when the primary focus is on the <u>knowledge of the sport or activity</u> , not movement.		
3. What percentage of class time was used for explanation of <u>rules</u> and regulations of the game or activity such as violations, scoring in bowling, or the specific rules in basketball?	_____	_____
4. What percentage of class time was used for giving information on <u>background</u> , history, rituals, heroes, or the importance of the activity for later years, such as team records or the fitness values?	_____	_____
5. What percentage of class time was spent on <u>demonstration</u> or an <u>explanation</u> on how to execute a skill such as watching a film; listening to a speaker, or	_____	_____

## Appendix A (continued)

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
listening to a lecture?	_____	_____
6. What percentage of class time was spent on giving information on the <u>strategy</u> of the game or physical activity such as an explanation of offense and defense or the progressions in a dance or a gymnastic routine?	_____	_____
Questions 7-8 refer to the class time students are <u>actively involved or participating in</u> skill practice, scrimmage, or a game.		
7. What percentage of class time was spent on <u>control skill practice</u> such as circle drill in passing a volleyball, dribbling around cones, practicing skills on the balance beam, or practicing a step in dance?	_____	_____
8. What percentage of class time were <u>skills applied</u> in a modified game, scrimmage, or the entire game such as a volleyball game, a complete balance beam		

## Appendix A (continued)

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
routine, a relay race, 100 yard		
dash, or a complete dance routine?	_____	_____
Total should equal 100%      TOTAL	_____	_____

PLEASE FILL IN THE SPACE BESIDE EACH QUESTION WITH ONE OF THE

FOLLOWING:

0%, 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%,  
70%, 75%, 80%, 85%, 90%, 95%, 100%

For each of the following questions estimate the percentage of class time each of the situations occur. The total for the seven questions should equal 100%. These seven questions refer to the specific type of individual student(s) involvement in the class.

Questions 1 and 2 refer to the percentage of time the student(s) were actively involved or participated in skill practice, scrimmage, or an entire game.

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
1. What percentage of class time was the student <u>actively involved</u> in a skill practice, a scrimmage, or an entire game play?	_____	_____

## Appendix A (continued)

	Before Class	After Class
	<u>Estimate</u>	<u>Estimate</u>
2. What percentage of class time during the physical activity was the student <u>acting as an assistant or a supporting role</u> such as spotting in gymnastics; feeding the balls to a hitter in tennis; or clapping to keep beat while others are dancing?	_____	_____
Questions 3-7 refer to the percentage of time the learners are <u>not</u> involved in a motor activity or game.		
3. What percentage of class time was the student not receiving information but waiting for the next instructions or opportunity to respond, such as <u>waiting in line</u> for the balance beam, waiting as a substitute to play in a game; or waiting for further directions?	_____	_____
4. What percentage of class time was the student <u>receiving information</u> by lecture or watching a demonstration such as listening to instructions or having a		

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