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THE EFFECTS OF MODIFICATION OF TEACHER BEHAVIOR ON THE ACADEMIC LEARNING TIME OF SELECTED STUDENTS IN PHYSICAL EDUCATION

The Ohio State University PH.D. 1983

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THE EFFECTS OF MODIFICATION OF TEACHER BEHAVIOR ON THE ACADEMIC LEARNING TIME OF SELECTED STUDENTS IN PHYSICAL EDUCATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements

for the Degree Doctor of Philosophy in the

Graduate School of The Ohio State University

By

Claire Lanier Hart, B.A., M.A.

* * * *

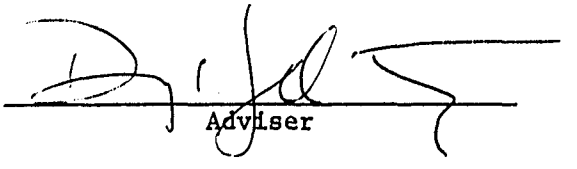
The Ohio State University

1983

Reading Committee:

Dr. Daryl Siedentop
Dr. William Heward
Dr. Charles Mand

Approved By



Adviser

Department of Physical Education

For My Husband, Michael
and
For My Daughter, Blaire Michele

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First, I would like to thank Dr. Daryl Siedentop for his support and guidance throughout this study. His leadership aided in my professional growth during my studies at The Ohio State University.

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VITA

December 4, 1949	Born - Miami, Florida
1971	B.A., Physical Education, University South Florida, Tampa, Florida
1971-1972.	Teacher, Casselberry Middle School, Winter Park, Florida
1972-1976.	Teacher - Coach, Pinellas County Maderia Beach Middle School, Maderia Beach, Florida
1975-1976.	M.A., Secondary Physical Education, University South Florida, Tampa, Florida
1976-1978.	Teacher-Coach, Pinellas County Pinellas Park High School, Largo, Florida
1978-1980.	Graduate Teaching Associate, School of Health Physical Education and Recreation, The Ohio State University, Columbus, Ohio
1980-1983.	Teacher, Pinellas County San Jose Elementary, Dunedin, Florida

PUBLICATIONS

"The Ohio State University Physical Education Teacher Education Program," (with Deborah Birdwell) in Vendien, L. and Rife, F. Physical Education Teacher Education (Introduction to Teaching), (in press).

PRESENTATIONS

AAHPERD 1978 National Convention, Kansas City, Missouri. Film "Concepts in Physical Education" representing physical education programs for high school level.

FIELDS OF STUDY

Major Field: Physical Education Teacher Education

Adviser: Dr. Daryl Siedentop

Minor Field: Applied Behavior Analysis

Adviser: Dr. William Heward

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CHAPTER I

INTRODUCTION

Student involvement in subject matter has been a persistent theme in educational literature. Early studies from the 1920's were based on classroom attention. The issues, at that time, were ones of efficiency and effectiveness as they related to teaching. There was little attempt to examine students in terms of involvement with learning. However, these studies provided the early knowledge base of what was and is perceived to be an important classroom variable.

In the 1940's, research on student involvement declined. It was not until the late 1950's that the topic re-emerged, and did so as one which was concerned with pursuing the underlying mental activity of students appearing to be engaged in learning. Bloom (1953) and his graduate students (Gaier, 1952; Schultz, 1951) were responsible for the re-emergence of the topic. From this time and into the early 1970's, research endeavors were concerned with validating the earlier observation studies by means of in-depth techniques, while at the same time trying to establish a link between student time-on-task and achievement.

In Life In Classrooms Philip Jackson (1968) reviewed the early research on student involvement. Speculating on the practical importance of student involvement as an object of concern, Jackson expressed the following sentiment.

> In education courses and in the professional literature, involvement and its opposite, some form of detachment, are largely ignored. Yet from a logical point of view few topics would seem to have a greater relevance for the teacher's work. Certainly no educational goals are more immediate than those that concern the establishment and maintenance of the student's absorption in the task at hand. Almost all other objectives are dependent for their accomplishment upon the attainment of this basic condition. Yet this fact seems to have been more appreciated in the past than it is today (p. 85).

In an attempt to identify correlates of effective teaching, research during the 1960's and early 1970's focused upon measured teacher classroom behaviors (processes) which correlated with measures of student achievement (product) in academic subjects. The majority of these studies related instructional processes directly to student achievement test scores (Filby and Cahen, 1977) which led researchers to focus primarily on the teacher and his/her activities with only secondary status given to student activity. Since this era began, the research emphasis has shifted from a primary concern with teacher behaviors per se, to a more intensive study of student activity.

The recent shift in research emphasis towards a more intensive study of student activity was provided by two important papers. First, Carroll's 1963 paper, "Model for School Learning" suggested that opportunity to learn was a crucial variable and that quality instruction was that which matches materials to student aptitude so that mastery can be achieved within projected time limits. According to Bloom (1974), by placing time as a central variable in school learning, Carroll generated a major shift in emphasis in research on teaching and learning. Carroll's notions of time, opportunity, and matching materials to aptitudes led to Bloom's work on mastery learning and refocused many

researchers' attentions on student time and quality of involvement with materials as importannt factors in achievement.

Secondly, in 1976, Harnischfeger and Wiley argued persuasively that student activity within the educational setting was the key to understanding the dynamics of learning. They claimed:

> A fruitful theory of teaching and learning must treat the pupil's activity as causally intermediate between the teacher's implementation of the curriculum and the pupil's learning. Pupil pursuits are therefore the focus of our conception of teaching - learning processes (p. 10).

Also at this time, studies focused on "content covered," such as pages of the textbook covered (Good, Grouws, and Beckerman, 1978), number of words taught per lesson (Beez, 1970) and number of mathematics problems covered (McDonald, 1976). Rosenshine (1971) and Armento (1977) noted that correlations between content covered and student achievement were greater than any observed teacher behavior variable.

Rosenshine and Berliner (1978) focused on what they termed "student variables" namely "Student Engaged Academic Time (SEAT)." The development of this concept, academic engaged time, was a product of combining content covered and the time a student is attending or engaged. Efforts were made to discover what contributed to SEAT, since SEAT affected student achievement.

This concept of academic engaged time was refined to become Academic Learning Time (ALT) from the work of Berliner et al. (1978, 1976) and the Far West Laboratory for Educational Research and Development through the Beginning Teacher Evaluation Study (BTES). The concept of Academic Learning Time (ALT) focuses on the amount of time a student is involved with task relevant material, while performing at a high rate of success.

> The variable used in BTES research is the accrued engaged time in a particular content area using materials that are not difficult for the student. This complex variable is called Academic Learning Time (ALT). Although the relationship is probably not linear, the accrual of ALT is expected to be a strong positive correlate of achievement. (Berliner, 1976, p. 124)

This emphasis on ALT led to a different research model. Whereas the process-product models related teacher activities directly to student achievement, the BTES researchers presented a model in which student activity (ALT) was a mediating link between the teacher's activities and the subsequent student achievement. The model appears below.

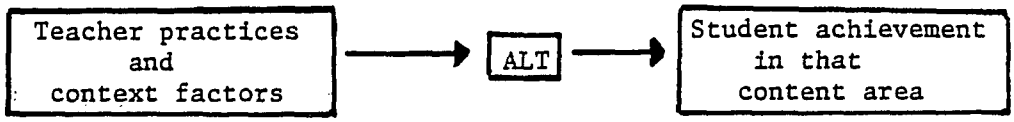


Figure 1. Model of ALT as Mediating Link

The BTES researchers found a consistent relationship between ALT and student achievement as measured by achievement testing (Marliave, et al, 1977).

Achievement is difficult to measure accurately in physical education. Valid, reliable measures of student achievement in physical education are hard to come by since physical education produces few permanent products, such as the classroom teacher regularly collects with tests and written assignments. No "standardized" tests exist that are at all analagous to those available for the classroom researcher.

Measurement in many sport skills is further complicated by the fact that the relevant skill performance is interactional. Therefore, this approach which suggests a mediating link (ALT) between teacher behavior

and student achievement is of great use in viewing the teaching and learning of motor skills in physical education.

Academic Learning Time-Physical Education (ALT-PE) is an application of the well-tested concept of Academic Learning Time (ALT) to the physical education area. In 1979 at the American Alliance for Health, Physical Education and Recreation, Siedentop, Birdwell, and Metzler (1979) presented the ALT-PE model, the coding format and coding conventions.

Metzler (1979) completed the first ALT-PE study, a descriptive study of physical education teachers using the ALT-PE system. Rate (1980) then conducted a similar study focusing on interscholastic athletic settings. Birdwell (1980) and Whaley (1980) followed with the first experimental studies utilizing ALT-PE as a criterion variable against which to evaluate changes in certain teachers' activities thought to be closely linked to levels of ALT-PE. Each of these studies was conducted at The Ohio State University.

The experimental study conducted by Birdwell (1980) had the first intervention on certain teacher activities thought to be closely linked to levels of ALT-PE. Interventions consisting of short instructional clinics and daily feedback were conducted on several teacher and student behaviors. The study demonstrated that mini-clinics and daily feedback to teachers were a successful and cost effective method for changing teacher behaviors and for helping teachers to change student behaviors. In noting the increase in ALT-PE and ALT-PE (motor) variables, it can be said that student achievement in physical education improved throughout

the duration of this study, implying that ALT-PE and ALT-PE (motor) are related to student achievement.

This study represented one of the initial efforts to analyze Academic Learning Time in physical education. It was an intent to conduct a systematic replication of Birdwell's (1980) study at the elementary level. In order to develop a science of teaching there must be the achievement of generality through systematic replication where one study builds upon another. How well a study replicates aides in generalization.

Each application of the replication helps one to better understand the technique. If one is to gain confidence in the reliability of a functional relationship and in the generality of that relationship, then there must be the repeated demonstration of a particular environment-behavior relationship across different subjects in different settings at different times (Siedentop, 1982). This study represents an effort to continue to analyze the relationship of teacher behavior to student academic learning time and to further develop the ALT-PE research.

Statement of the problem

The purposes of this study were:

1. To train physical education teachers in selected schools in the Pinellas County school system as observers to collect data with the revised 1982 ALT-PE instrument.
2. To measure the levels of ALT-PE at the elementary level in Pinellas County.
3. To intervene on teacher behavior and classroom condition in several physical education contexts in order to analyze the

relationship of teacher practices to the academic learning time of students.

There are two specific questions that this research attempted to answer:

1. Can selected behaviors of inservice physical education teachers be changed significantly through intervention?
2. Will these changes in teacher behavior be associated with increases in student academic learning time in physical education?

Limitations of the Study

This study was limited by the following factors:

1. The study was limited to observation of and intervention upon four inservice physical education teachers at the elementary level.
2. The study was limited to public schools in the Pinellas County school system. All schools were suburban type.
3. The study was limited to female inservice teachers - one with two years teaching experience, both at the elementary level; one with three years teaching experience, first year at the elementary level; one with thirteen years teaching experience, all at the elementary level; and one with sixteen years teaching experience, second year at the elementary level.
4. The study was limited to the observation of selected and precisely defined student behaviors.

5. The study was limited to observing three target students in each teacher's classroom in order to gain information regarding academic learning time.
6. The study was limited to observing each inservice teacher no less than 24 and no more than 28 times over a ten week period.
7. The study was limited to having the same observer in each school throughout the entire study. The observers were physical education teachers in each school.
8. The study was limited to having an investigator that was teaching full time at the elementary level. This placed certain time constraints throughout the study.

Assumptions of the Study

1. The student and teacher behaviors in this study were observable and measurable, and that the observers who recorded those behaviors did so in accordance with the behavioral definitions provided to them.
2. Teacher and student reactivity were satisfactorily reduced so that the observed behaviors were representative of each teacher's and student's actual day to day behavior.
3. The interval recording techniques employed in this study constitute a representative sample of student behaviors to be found in continuous observation of behavior (Hall, 1971).
4. Academic learning time percentage for each student was assumed to be fair estimate of achievement in physical education settings.

Definition of Special Terms

Several terms found in the text of this study will have restricted or special meanings. Included within these terms are the specific student behavioral definitions used in the observation instrument in the study. The reader is directed to Chapter III (page 41) for those definitions. The following terms are used frequently in the study:

Academic Learning Time-Physical Education (ALT-PE) - The amount of time a student spends engaged in a subject matter motor activity in such a way as to produce a high degree of success.

Inservice Teachers - Refers to the four public school teachers, certified K-12, teaching at the elementary level in Pinellas County, who were subjects for this study.

Interval Recording - The observational recording of several student behaviors within a specified period of time.

Reactivity - The potential disturbance of natural behavior patterns due to the interjection of an observer into the natural setting.

Reliability - The percentage of agreement for how often two trained observers watching one subject and equipped with the same definitions of behavior see it occurring or not occurring at the same standard time (Baer, 1977).

Summary

Within this chapter, the purposes of the study have been indicated. Questions to be addressed were enumerated, and limitations, assumptions and special terms were delineated. The next chapter is a review the related literature appropriate to the conducting of this study.

The literature review will focus on these specific topics:

1. Research on student engaged learning time (e.g. "student attention," "time-on-task," or "student engagement") in the context of research on teacher effectiveness
2. Teacher behavior change studies in physical education conducted in The Ohio State University Physical Education Teacher Education program
3. The Beginning Teacher Evaluation Study and the Juniper Gardens Childrens' Project on student attention and opportunity to respond
4. Research on Academic Learning Time-Physical Education with a review of the first descriptive study on ALT in physical education (Metzler, 1979) and on one of the first experimental studies utilizing ALT-PE as a criterion variable against which to evaluate changes in certain teacher activities thought to be closely linked to levels of ALT-PE in physical education classes (Birdwell, 1980)

CHAPTER II

REVIEW OF RELATED LITERATURE

This review begins with an introduction to research on "student engaged learning time" in the context of research on teacher effectiveness. The second part focuses on teacher behavior change studies in physical education, conducted in The Ohio State University Physical Education Teacher Education Program. The third part reviews the literature from the Beginning Teacher Evaluation Study (BTES) on Academic Learning Time and the Juniper Gardens Children's Project (JGCP) on student attention and opportunity to respond. Finally, research on Academic Learning Time-Physical Education is reviewed. An account of the first descriptive study (Metzler, 1979) and one of the first experimental studies on ALT in physical education (Birdwell, 1980) is made within this section.

Research on Teacher Effectiveness: Studies on Student Engaged Learning Time

Research on "student attention," "time-on-task" or "student engagement" has an extensive history that reflects a continuing concern for common phenomenon by both researchers and practitioners. Smyth (1981) undertook a survey of the research on the phenomenon of student engaged learning time and classified it into three phases:

1. An early era, in which both the problem and the approach were mechanistic and concerned with issues of efficiency and effectiveness as they related to teaching

2. A modern era, where the pre-occupation was with establishing a correlation association with the outcome measure of pupil achievement, and where the methodology reflected the need to verify data collected by observational means

3. A recent era, where the nexus with achievement has been unquestionably established, and where current efforts are being directed at isolating associated teaching and classroom-related variables (p. 135)

Early studies reflected the community concern with matters of efficiency and effectiveness during the "scientific management" era of the 1920's. French's (1924) study of elementary and junior high school classes during recitation, represented a pioneering study in the use of group attention scores as an index of teacher effectiveness. He demonstrated a high correlation between principal ranking of teacher ability and observer judgment of group attention, levels of attention being in excess of 90 percent. Morrison (1926) was notable for his contribution towards the methodology of obtaining class attention scores. He obtained class "attention scores" by scanning the class row by row each minute, noting on a scorecard students who were inattentive. Studies that followed French and Morrison's initial work maintained that teachers had to aim for 100 percent class involvement, or be considered delinquent in their duties (Bjarnason, 1925; Symonds, 1926; Knudsen, 1930; Olson, 1931).

Increased use of Morrison's technique produced studies designed to test his methodology of obtaining "class attention scores." Blume (1929) supported the technique concluding that "once the technique had been learned, the attention scores obtained had a high degree of reliability" (p. 43). On the other hand, Barr (1926) did not support the technique. He dropped attention scores as a method of evaluating

teacher effectiveness on the basis of unreliability. Despite finding attention levels in excess of 90 percent, Washburne, Vogel, and Gray (1926) questioned whether student eyes on the teacher or testbooks were indicators of attention to academic tasks. Morrison (1926) claimed that extended observation would resolve the problem of determining attentiveness in expressionless students, and that the scorecard could be amended accordingly. Knudsen (1930) argued that student "faking" attention was not a problem on the grounds that it would be relatively consistent from class to class. Based on correlations derived from three students, Shannon (1936, 1941, 1942) dismissed class attention scores as a valid form of measurement of teacher effectiveness. These early studies were practical in their orientations, but they suffered in both methodological and substantive nature. One should focus on how these studies were beginning to build a knowledge base of what was perceived to be an important classroom teaching and learning variable.

In the early 1940's, research on attention declined momentarily during the time when classrooms were promoted as democratic settings. Bloom (1953) and his graduate students (Gaier, 1952; Schultz, 1951) were responsible for the re-emergence of the topic during the early 1950's. They were concerned with pursuing the underlying mental activity of students appearing to be engaged in learning. They used a recall technique of recording classroom dialogue and then replayed it to students, and asking them about their thoughts at the time. Bloom found university students' thoughts to be on-task for 64 percent of lecture time and 55 percent of discussion time. Negative correlations between

observed attention and student self-reports of attentiveness were reported by Hudgins (1967) and Taylor (1968), however.

A second group of studies (Morch, 1956; Edminston and Rhoades, 1959; Lahaderne, 1968; Cobb, 1972; Ozcelik, 1973; Bloom, 1974; Samuels and Turnure, 1974; McKinney, Mason, Perkerson and Clifford, 1975 and Anderson, 1976) similarly conducted during this time, actively persued the linkage between a student's attention and achievement. They provided reasonably consistent findings that the amount of time actually spent on-task was predictive of student learning.

Stallings and Kaskowitz (1974) found a high positive correlation between time on-task and mathematics achievement in their study of third grade low achievers in mathematics. Hess and Takanishi (1973), in an effort to move toward the analysis of controllable variables, found a negative relationship between the size of student groupings and student engagement on-task. Research done during the 1950's and into the early 1970's was concerned with validating earlier observational studies by means of in-depth techniques, while at the same time trying to establish a link between student time-on-task and achievement.

In Spring, 1976, a special publication of the Journal of Teacher Education highlighted a series of studies presented at a National Institute of Education conference and a synthesis of these studies done by Cruickshank. Cruickshank noted a large number of studies on the "how" of teaching, which look at teacher behavior, but which leave largely unexplained the means by which student learning is affected. Teacher behavior is portrayed as somehow mysteriously and directly influencing student achievement (Fischer, et al., 1978).

Two papers led researchers to the growing realization that teacher behavior per se does not directly influence pupil achievement, and towards exploring the relationship between teacher controllable variables and the behavior and pursuits of students. First, Carroll's (1963) "Model of School Learning" had five elements:

1) aptitude - the amount of time needed to learn a task under optimal instructional conditions,
2) ability to understand instructions...
3) perseverance - the amount of time the learner is willing to engage actively in learning...
4) opportunity - time allowed for learning, and
5) the quality of instruction - a measure of the degree to which instruction is presented so that it will not require additional time for mastery beyond that required in view of aptitude (p. 729).

Carroll suggested that student opportunity to learn was a crucial variable and that quality of instruction is that which matches material to student aptitude so that mastery can be achieved within projected time limits. Secondly, in 1976, Harnischfeger and Wiley claimed:

> A fruitful theory of teaching and learning must treat pupil's activity as causually intermediate between the teacher's implementation of the curriculum and the pupil's learning. Pupil pursuits are therefore the focus of our conception of teaching - learning processes (p. 10).

Studies that focused on "content covered," such as pages of the textbook covered (Good, Grouws, and Beckerman, 1978), content of textbooks (Pidgeon, 1970), number of words taught per lesson (Beez, 1970), number of mathematics problems covered (McDonald, 1975) or books read (Harris, Morrison, Serwer and Gold, 1968) show significant relationships between content covered and student achievement gains. Rosenshine (1971) and Armento (1977) noted that correlations between content covered and student achievement were greater than any observed teacher behavior variable. Porter, Schmidt, Floden and Freeman (1978)

emphasized the need to measure and account for content covered in studies relating to student achievement.

Rosenshine and Berliner (1978) focused on what they termed "student variables," namely "Student Engaged Academic Time (SEAT)." SEAT was treated as a dependent variable, and efforts were made to discover what contributed to it since it affected student achievement. From this developed a new concept, academic engaged time, that is the product of combining the content covered and the time the student is attending or engaged. Rosenshine and Berliner (1978) supported the idea that student engagement was essential, maintaining that effective teachers were the ones who put students into contact with academic materials and kept them engaged.

The refinement of academic engaged time has resulted in Academic Learning Time (ALT) from the work of Berliner (1978, 1979), Fisher (1978), Fisher, Filby, Marliave, Cahan, Dishaw, Moore, and Berliner (1978 a), Marliave (1978) and the Far West Laboratory for Educational Research and Development through the Beginning Teacher Evaluation Study (BTES). The concept of Academic Learning Time (ALT) focuses on the amount of time a student is engaged in task relevant material, while performing at a high rate of success. The accompanying assumption is that the more ALT a student accumulates, the more it can be assumed a student is learning. A consistent relationship emerged across a number of studies between ALT and student achievement as measured by achievement testing (Rosenshine and Berliner, 1978; Fisher, Filby, Marliave, Cahan, Dishaw, Moore, and Berliner, 1978).

A similarity exists between studies which examined student attention and the ALT studies in that both examined student learning pursuits in the classroom, but a number of distinctions should also be noted. First, the earlier attention studies had a group focus within a classroom, in contrast to ALT studies which intensively study a sample of target students from within particular classrooms. Secondly, whereas the attention studies did not consider the academic content of pupil focus, this has been a prominent aspect of ALT investigations. Thirdly, attention studies were only concerned with the variable of student attention; ALT studies, while focusing on the pursuits of the student have sought to capture as well, teacher behaviors and classroom variables that appear to have an effect on the student. Finally, the attention studies were intended as an index for rating teacher performance or effectiveness, in contrast to the ALT efforts which have been directed towards the isolation of intervening teacher and classroom variables contributing towards enhanced student achievement. Further review of the BTES research and its impact will be discussed in the third portion of this chapter.

Behavior Change Studies in Physical Education

It is the research tradition associated with Skinnerian behaviorism that provides a programmatic behavior analysis research program in physical education at The Ohio State University with its theoretical orientation and methodology (Siedentop, 1978). Locke (1979) maintains that the studies which make up this programmatic effort have provided "the first absolute confirmation that it is possible to induce any specific behaviors in a group of working physical education teachers."

An integral part of the intervention packages used in The Ohio State University behavior change programs in physical education is systematic feedback providing direct information regarding teaching performance. Hughley (1973) provided daily feedback to student teachers based on systematic observation, as well as instructions, cuing, reinforcement and goal setting. Rife (1973) provided observation/feedback from a twice weekly supervisory format and included modeling in the intervention package. Several studies utilized a competency based framework (Darst, 1974; Hamilton, 1974; Boehm, 1974) to change teacher behaviors and packaged the intervention modules in a self-instructional format. A number of studies demonstrated that observation/feedback and other intervention procedures could be delivered by persons other than a university supervisor. Dodds (1975) and McMillan (1978) utilized peer feedback systems, Dessecker (1975) experimented with self-change systems, Cramer (1977) and Hutslar (1976) trained cooperating teachers to assume the observation/feedback function, and Birdwell (1980) used mini-clinics and daily feedback to change certain teacher activities thought to be closely linked to levels of ALT-PE in physical education classes.

In all of these studies, the subjects were physical education teachers or student teachers and the behaviors which were modified included: (1) positive reactions to on-task behavior, (2) positive reactions to on-task behavior with specific information, (3) negative reactions to off-task behavior, (4) general positive skill feedback, (5) specific positive skill feedback, (6) corrective skill feedback,

(7) use of student's first names, (8) classroom management time, and (9) reduction of student non-engagement.

With such a highly successful research effort, it would seem logical that these intervention technologies, particularly ones so cost-effective as providing instructions and immediate feedback, ought to demonstrate the effectiveness in changing the behavior of in-service teachers of physical education.

Research from the Beginning Teacher Evaluation Study and the Juniper Gardens Children's Project

The BTES was initiated in 1972 by the California Commission for Teacher Preparation and Licensing (CCTPL) and funded by the National Institute for Education. CCTPL believed that sponsorship would lead to findings that might be directly applied to making improvements in teacher training, and hence strengthen day-to-day education for students (Fisher et al., 1978). The purpose of the BTES was to examine various instructional factors that promote student learning from elementary school instruction in basic skills. The BTES was conducted in three separate phases. Phase I was strictly a planning year undertaken in 1972-1973. Phase II (1973-1974) consisted of a large field study, the development of instrumentation, and the generation of various research hypotheses. This phase was carried out by a team of researchers at Educational Testing Services and headed by Frederick McDonald (1974).

During Phase II the BTES researchers developed another tool to be used in the study of teacher effectiveness, the Experimental Teaching Unit (ETU). An ETU consists of a unit of instruction which provides a teacher with an introduction, rationale, performance objectives keyed to pre-post test items, a wide variety of instructional materials and

activities, and pre- and post-tests. (Ward and Tikanoff, 1976). The teacher is to instruct in any appropriate way. Achievement and teacher effectiveness are then determined by pre-post test correlations.

Phase III (1964-1978) consisted of a series of field studies designed and conducted by the Far West Lab for Educational Research and Development in San Francisco. The purpose of these field studies was to identify various classroom conditions and activities in grades two and five that lead to student learning in the basic skills of reading and mathematics.

A model of instruction (see Figure 2) was developed with the idea that for a given student there are certain instructional processes that lead to learning which is then reflected in achievement scores taking aptitude into consideration (Fisher, et al., 1976).

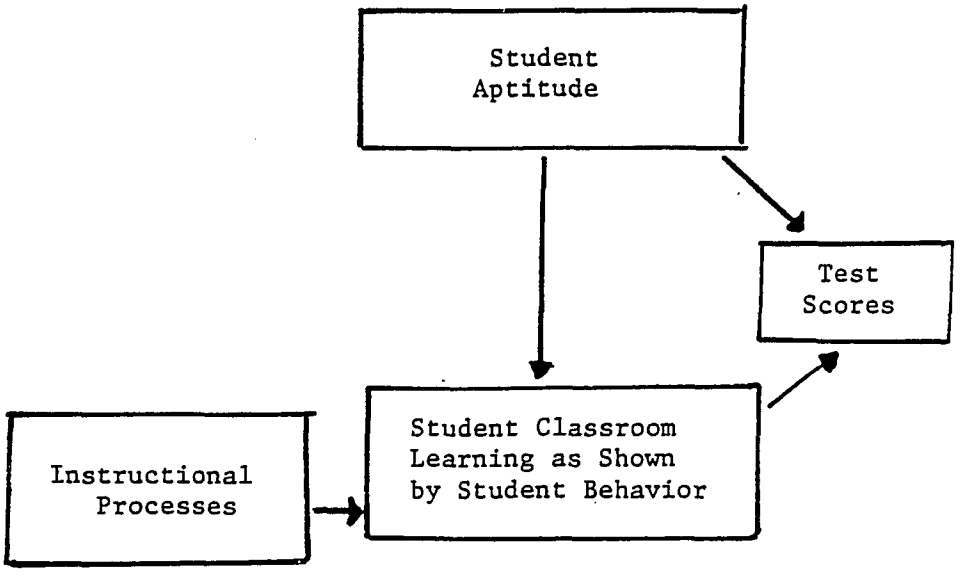


Figure 2. Model of Instruction

The Academic Learning Time Model, developed during Phase II to incorporate time as the important variable in the learning process (Wiley and Harnischfeger, 1974), is composed of three elements: allocated time, engaged time, and task difficulty in terms of success rate. Allocated time was defined as the time set aside by the teacher for instruction and practice of academic tasks. Engagement was the time that the student was actually involved in making academic responses, whether written, oral or covert. Task difficulty was defined in terms of success rate. High rates of success provide situations in which students make errors due to carelessness. Students having low rates of success simply do not have an understanding of the task at hand and have only a chance rate of success. Medium success rates are all those instances between high and low. Hence, academic learning time (ALT) can occur only when the student is engaged and is defined as the amount of time that a student spends engaged in a task that produces few student errors and which is directly related to a defined content area (Fisher, 1977).

The development of instrumentation to measure student engagement in specific content categories in reading and mathematics was conducted along with an effort to examine instructional processes, to ascertain which teacher behaviors have an impact on student achievement by influencing facets of Academic Learning Time (ALT) (Marliave, 1977). A model for conceptualizing the teacher behaviors that might influence ALT is presented in Figure 3 (Fisher et al., 1978).

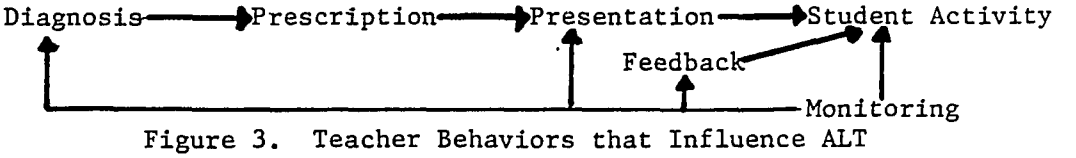


Figure 3. Teacher Behaviors that Influence ALT

From Phase III of the BTES there were fourteen major findings. These were reported in the Summary report of teaching and learning in the elementary schools (Fisher et al., 1978). Data for this report were collected over a period of one year in 25 grade two and 21 grade five classrooms in the content areas of reading and mathematics. There were two sets of findings. The first set examines the relationship between ALT and student achievement.

1. The amount of time teacher allocated to instruction in a curriculum area is positively associated with learning in that content area.

There were large differences in allocated time observed across all classes, grade levels and subject matter. In second grade math, the range was from 25 minutes to 60 minutes daily. In fifth grade reading, the range was from 60 minutes to 140 minutes daily.

2. The proportion of allocated time in which students are engaged is positively associated with learning. This rate of attention/engagement varied widely from an average of 50 percent to an average of 90 percent in some classes.
3. The proportion of time that reading and mathematics tasks provide a high success rate for a student is positively associated with learning.

Materials that were easy, with few errors, contributed to a high success rate for a student, and increased student self-esteem. The average student in the BTES spent about 50% of the time working on tasks at a high success rate.

4. The proportion of time spent in tasks providing low success rate is negatively associated with student learning.

5. Increases in ALT are not associated with decreases in attitudes toward school, math or reading. In fact, there was a slight positive trend in those students that experienced high success rates.

The final set of conclusions focus on the instructional processes and classroom environment. They try to answer the question regarding what teaching behaviors and classroom environmental characteristics have influence upon student achievement.

6. The teacher's ability to diagnose student skill level is related to student achievement and ALT.
7. The teacher's ability to prescribe appropriate tasks is related to student achievement and success rate.
8. More substantive interaction between the student and the teacher, i.e. presentation of content, practice, feedback, monitoring, is associated with higher levels of student engagement. The converse would certainly indicate that increased managerial time would be negatively associated with student engagement.
9. Academic feedback is positively associated with student learning.
10. The structuring of lessons and giving directions on task procedures are positively associated with student success rate.
11. Explanation specifically in response to student need is negatively associated with student success rate.
12. Frequent reprimands for inappropriate behaviors are negatively associated with student learning.

13. A teacher's value system is related to ALT and student achievement. The emphasis on academic goals is positively related to student learning. The teachers who were more businesslike and task-oriented achieved more student gains. Classes concerned with affect as a major objective spent less time on academic goals and hence produced less achievement.

14. A learning environment characterized by student responsibility for academic work and by cooperation on academic tasks is associated with higher student achievement. Those classes which were characterized as having a strong academic focus were also the ones in which students took responsibility for their work, their belongings, helped each other, and shared materials.

This major research effort contributed to the structure of the ALT-PE research model. ALT is of considerable practical importance in terms of its relationship to student achievement. Large differences in ALT are associated with significant changes in predicted achievement levels. Marliave (1978) reported that this ALT variable accounted for an average of 11% residual variance in second and fifth grade math and reading skills after preachievement effects were removed. In physical education, given the fact that there are, as yet, no useful standardized achievement tests by which student performance might be judged, utilizing student academic learning time might be a method to predict student achievement and thus judge teacher effectiveness.

The final results of the BTES Phase III described the actively involved "learning student" (Fisher et al., 1978). This student works on

tasks designed to increase skill, is attentive, spends a large proportion of time in practice and review, and, possibly, develops positive attitudes toward work. Many of these behaviors can be controlled directly by teachers. The results also clearly delineate certain teaching behaviors that tend to be associated with effective teachers, i.e. producing achievement in students. Effective teachers in the BTES study were skillful diagnosticians, were able to deliver the instruction clearly, monitored their classes, and provided feedback for learners' academic responses. This certainly gives perspective in the design of an intervention program for physical education teachers.

A smaller intervention study was conducted simultaneously with the larger investigation (Berliner et al., 1978). Four second grade classes were selected for clinical interventions. The variables of interest included wait time, transition time, total allocated time in reading and math, percent engaged time in reading and math, and ALT in reading and math. The interventions consisted of attempts to affect the five teaching functions (refer to Figure 3) that had been demonstrated to influence ALT. Conferences were held with the teachers. Although the interventions followed no set pattern, attention was given to time-on-task, management systems, teacher language behavior such as increasing feedback, provision for starting assignments, contingency management procedures, and various spatial considerations. Results showed that teachers could modify their teaching behaviors and subsequently show an increase in ALT in both reading and mathematics.

An interesting aspect of this study was that in addition to the intervention classrooms, a group of seven teachers attended two half-day

workshops on the importance of engaged time and other related variables. These teachers were able to increase ALT in their classrooms even more dramatically than the intervention group. This finding has important implications for training large numbers of teachers to be more effective by using such a series of brief, inexpensive workshops that also requires little in the way of teacher response-cost.

A research project was being carried out under the direction of R. Vance Hall at the same time that Far West Lab was conducting Phase III of the BTES. This project, the Juniper Gardens Children's Project (JGCP), was a community based research program sponsored by the Bureau of Child Research, the Department of Human Development and Family Life, and the Department of Special Education of the University of Kansas, and its research has direct relevance to the BTES as well as the development of the ALT-PE model.

This research program focused on motivation to learn in preschool (Risley and Hart, 1968; Hart and Risley, 1974), special classrooms (Wolf, Giles and Hall, 1968; Clark, Lachowicz and Wolf, 1968; , regular classrooms (Hall, Lund and Jackson, 1968; Harris, Harris and Hall, 1972), and homes (Hall et al., 1972; Hall, Copeland and Clark, 1975). Using the research methodology of applied behavior analysis, various achievement behaviors were intervened on directly through reinforcement of academic responses and also indirectly through decreased disruptions and increased time on task. As the program continued, it became evident that not only would increased systematic reinforcement contribute to achievement, but simply the provision of additional opportunity for academic responding was an

important element in increasing student learning. Hall et al. concluded:

> The realization we have come to at Juniper Gardens is that perhaps the basic element which has been lacking in the homes and classrooms of the inner-city is not motivation, per se, nor does it seem to necessarily be curriculum materials. Rather, it seems quite possible that the major factor may be a lack of opportunity to make active learning responses. (1977, p. 13)

The following are speculations as to the reasons for the lack of opportunity to respond in classrooms. Hall, et al. concluded: (1) it may not be obvious to teachers that students need to spend more time responding if they are to learn, (2) the curriculum training of the teaching system operating in the classroom may work against providing opportunities for students to make responses, (3) having pupils increase their rates of responding may be punishing to teachers, parents and students themselves, and (4) school policy and/or classrooms are not engineered to maximize responding.

Delquadri, Greenwood and Hall (1978) gave recognition to the relationship between "opportunity to respond," the BTES notion of "academic engaged time," and academic achievement. A descriptive field study was conducted with twelve elementary school students utilizing an interval recording system with rate of responding as the unit of measurement. Results closely paralleled those of BTES in that the amount of actual responding in academic areas was very low. It was discovered that over half of the day was spent in math and reading, and only a small proportion of that time was spent in active academic responding. In an average six hour day, the category Reading Aloud accounting for only 2.9 minutes.

If one assumes that student ALT and opportunity to respond are two different ways to view the same phenomenon, then the strong research findings from both the BTES and Juniper Gardens project represent substantial convergent validity (Johnson and Bolstad, 1973) for the concept of ALT as a variable related to student achievement.

Another important aspect of the research findings from Juniper Gardens is the emphasis on providing opportunities for students to increase academic responses without subsequently increasing the workload for the teacher. This feature of low response-cost for teachers is extremely important as interventions are developed for increasing student ALT in physical education.

Research on Academic Learning Time-Physical Education

In March, 1979, at the annual meeting of the American Alliance for Health, Physical Education and Recreation, Siedentop, Birdwell, and Metzler (1979) presented a series of papers aimed at explaining the ALT-PE model and presenting the coding format and conventions. At this time, the ALT-PE model grew from the Beginning Teacher Evaluation Study and the Juniper Gardens Children's Project.

The observation and systematic recording of ALT-PE (1979) involved four major category decisions: (1) Setting, (2) Content, (3) Learner Moves,and (4) Difficulty Level. The Setting categories described the basic format for instruction within the class using Mosston's (1966) spectrum of teaching styles. The Content categories were divided into two main groups, those reflecting a nonacademic focus and those reflecting a content-oriented physical education focus. This category was compared to allocated time in that it was to yield information about the

degree to which teacher planning was actually implemented. The involvement of the individual student, Learner Moves, was reflected in three categories of engagement and three categories of nonengagement. The Difficulty Level of the student involvement with subject matter was reflected in three categories based on the estimated error rate of student responses.

The observation format was an interval recording system used extensively in behavior analysis research (Cooper, 1974). For any single observation unit to be counted as an instance of ALT-PE, the observed student would have to be engaged in physical education content at a low error rate. This meant that ALT-PE was not attributed to observations in which (1) non-physical education content was recorded, (2) physical education content was recorded but the student was not engaged, and (3) physical education content was recorded in which the student was engaged but at a high or medium error rate.

Metzler (1979) completed the first ALT-PE study, a descriptive study of physical education teachers. The study included thirty three classrooms observed at the elementary level, junior high and senior high school levels in Ohio.

On the Setting level, only three of the six categories were observed and Direct Instruction and Task accounted for 99.6 percent of all intervals. There was a large decrease in Direct Instruction from elementary classes to upper grade levels (64% and 62%), and a corresponding (91.4%) increase in Task (8.6% -- 35% -- 38%). This suggested that while physical education teachers may be knowledgeable of several instructional modes, they implemented only two of them for classroom use.

The two highest percentage content activities were of physical education academic content: Skill Practice (28.7%) and Games (27.7%). The third most frequently occurring content level activity was Transition (16.1%). Combining the Wait, Transition, Management, Break and Non-Academic Instruction categories, students spent 26.4% of the class time in task irrelevant activities which were of a class organization nature. While some amounts of class time must be spent on these activities, this percentage was much too high and an area that could be reduced through improved planning by teachers.

The most frequently occurring category in Learner Moves was Not Engaged Waiting (20.3%). Cognitive Engagement (15.2%) was the next most frequently occurring category. Motor Responding occurred only 14%. The amount of Cognitive Responding exceeded the amount of Motor Responding at two of the grade levels and in the means of all observations. This seemed to suggest that classroom practices are incongruous with stated motor skill acquisition goals of physical education instruction.

The Not Engaged categories, at Learner Moves level, accounted for 37.7 per cent of class intervals while Engaged categories accounted for only 36 per cent of all intervals. Therefore, when students were in physical education content, they were not engaged more often than engaged. Some amounts of not-engaged time could be a function of limited facilities and equipment, but some amounts of not engaged time could be reduced through improved planning. Also the amount of time given to motor and cognitive responding is mostly controlled by the teacher. This needs to be altered to give students more time and opportunities to

make motor responses while reducing the amount of cognitive responding to minimal levels needed to facilitate motor skill acquisition.

Metzler (1979) found little evidence of task difficulty. He faulted problems in the design of the instruction because it limited students' opportunity to respond. A mean of 9.1 minutes of ALT-PE per class was recorded, and ALT-PE (motor) was less.

Prior to each observation, the teacher determined the percentage of class time for student skill practice and teacher demonstrations. This was called Allocated Time. Typically, the teacher estimated class management time and subtracted it from the total class time to arrive at allocated time. Total class time did not include before and after class changing time. Using allocated time, along with four other constructs of class time, Metzler (1979) found a "funneling effect" during physical education classes (See Figure 4).

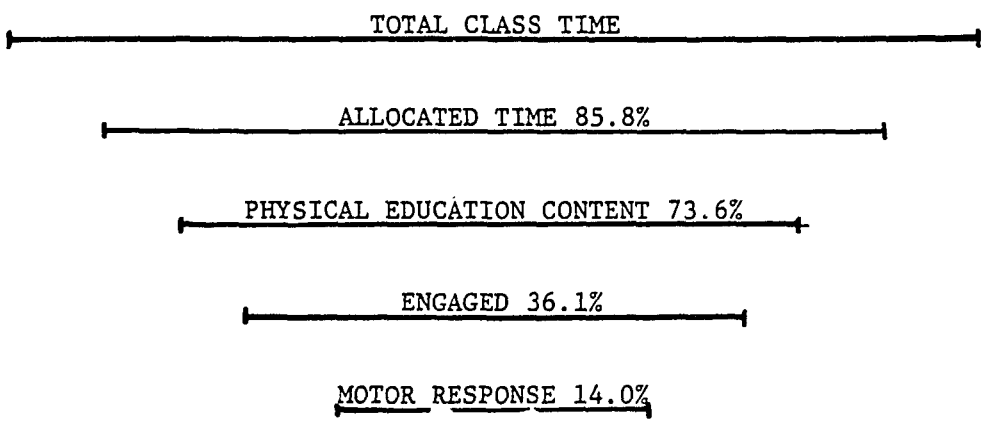


Figure 4. Observed "Funneling Effect" of Student Class Time Involvement

The top of the "funnel" is total class time, while the bottom of the "funnel" is the percentage of intervals in which students were

observed in skill practice. It is expected that not every minute of class time can be spent in productive physical education content, but the funneling effect at each tier seems more drastic than could be considered conducive to motor skill acquisition.

Metzler's descriptive study provided evidence that there was and is a need for improvement in the way physical educators manage their classes. The findings, in general, indicated that teachers must plan better so as to increase the actual amount of time allocated for instruction and practice, decrease the amount of managerial time, provide more engaged time for students and emphasize the motor response aspect to ensure that the goal of skill acquisition is realized.

In 1980, Birdwell conducted one of the first experimental studies utilizing ALT-PE as a criterion variable against which to evaluate changes in certain teacher activities thought to be closely linked to levels of ALT-PE in physical education classes. She adapted Metzler's (1979) ALT-PE coding instrument to closely mirror the original BTES instrument. The ALT-PE Teacher Behavior Observation System sampled the instructional setting, content of the instruction, student behavior in the form of engagement and difficulty level and teacher behavior. Teacher Behavior categories in the BTES instrument are similar or identical to those included in the ALT-PE Teacher Behavior System. They include substantive behaviors such as presentation (lecture and response to student need), monitoring, asking questions, and academic feedback and procedural behaviors such as giving directions and task engagement feedback (equivalent to behavior praise and nags).

Birdwell's study involved the collection of data in three physical education settings at the elementary, junior high and senior high levels. Three teachers, one at each level, served as subjects for the study. Interventions consisting of short instructional clinics and daily systematic feedback were conducted on several teacher and student behaviors. The variable ALT-PE and ALT-PE (motor) were examined but never subject to intervention. Some conclusions of the study were:

1. Intervention consisting of instructions and daily systematic feedback was successful in decreasing managerial time from a baseline mean of 26.1 to an intervention mean of 6.3 for Teacher 1; and from a relatively low baseline mean of 11.7 to an intervention mean of 4.1 for Teacher 2.
2. Intervention was successful in reducing a low percentage of student non-engagement in baseline of 21.2 to an intervention percentage of 16.0 for Teacher 1; from a baseline percentage of 36.6 to an intervention mean of 13.8 for Teacher 2; and from a baseline mean of 33.4 to an intervention mean of 10.4 for Teacher 3.
3. Although no statements of causality could be made, ALT-PE increased from a baseline mean of 41.6 to total intervention mean of 60.04; and ALT-PE (motor) increased from a baseline mean of 17.25 to an intervention mean of 39.26 for Teacher 1. ALT-PE increased from a baseline mean of 19.86 to total intervention mean of 49.34; and ALT-PE (motor) from a baseline mean of 12.18 to total intervention mean of 37.34 for Teacher 2. ALT-PE increased from a baseline mean of 43.32 to an

intervention mean of 62.8 and in ALT-PE (motor) from a baseline mean of 23.44 to an intervention mean of 42.46 for Teacher 3.

The study demonstrated that instructions (mini-clinics) and daily systematic feedback to teachers were a successful and cost effective method for changing teacher behaviors and for helping teachers to change student behaviors. In noting the increase in the ALT-PE and ALT-PE (motor) variables, it can be said that student achievement in physical education improved throughout the duration of this study, given the assumption that these variables are related to student achievement.

This study represented one of the initial efforts to change Academic Learning Time in physical education settings. It could also represent a model for conducting future experimental studies involving ALT-PE. It was the purpose of this study to conduct a systematic replication of this experimental study designed to analyze ALT-PE only at the elementary school level in Pinellas County with the revised 1982 ALT-PE model.

Summary

This chapter has reviewed the literature relevant to the scope and content of this study. The first part began with an introduction to research on "student engaged learning time" in the context of research on teacher effectiveness.

The second part focused on the teacher behavior change studies in physical education which were part of The Ohio State University Physical Education Teacher Education programmatic research effort. These studies provided a strong basis for the development of effective intervention procedures.

The third part examined the literature from the Beginning Teacher Evaluation Study and the Juniper Gardens Children's Project. A description of the major findings of the Phase III of BTES and their relationship to student achievement and teacher behavior was made. It was also these findings that formulated an intervention study conducted by Birdwell (1980).

The Juniper Garden Children's Project emphasis on the variable "Opportunity to respond" was reviewed. A relationship between this variable and Academic Learning Time was established.

The final part reviewed the beginning of the research on Academic Learning Time-Physical Education. An account of the first descriptive study (Metzler, 1979) and one of the first experimental studies on ALT in physical education (Birdwell, 1980) was given showing a sound base for more research efforts in this area.

The following chapters of this study describe the methods used to collect data for analysis, the intervention procedures, the results of the intervention and a discussion of the findings.

CHAPTER III

SOURCES OF DATA, PROCEDURES AND METHODS OF DATA ANALYSIS

The first part of this chapter describes how subjects for this study were selected and the settings in which the subjects were observed. The second part of this chapter provides a description of the observation instrument and procedures utilized to train observers to use the instrument. Included in this part is a short description of the establishment of inter-observer agreement. The third part describes the intervention phase of the study, and the final portion of this chapter delineates the methods of data analysis used in Chapter IV.

Subjects and Setting

The subjects of this study were four selected physical education teachers in public schools in the Pinellas County School District. All four teachers were university graduates, trained in physical education. Two of the four subjects were acquainted with the investigator before they were asked to participate in the study.

Subject One was a 26 year old female with two years teaching experience at the elementary level. The suburban school in which this subject taught can be characterized as lower middle to middle SES, with a racial balance of approximately 26% black, 74% white and an enrollment of 850 students.

A first grade class was selected for observation in this school. Total class size numbered 34 and from this total, three target students were randomly selected from a list provided by the teacher containing names of students who had high attendance. These target students included a white female, a white male, and a black female. This teacher and selected students were observed during the afternoon, three or four times a week for a ten week period, for a total of 24 observations.

Subject Two was a 36 year old female with two years of teaching experience in Puerto Rico at the secondary level, and a first year teacher in Pinellas County at the elementary level. The subject was teaching in a suburban school with a lower middle SES, a racial balance of approximately 19% black, 81% white and an enrollment of 850 students.

A third grade class was selected for observation in this school. Total class size numbered 26 and from the total, three students were randomly selected who had high attendance. This teacher and selected students were observed during the later morning hours, three or four times a week for a ten week period, for a total of 28 observations.

Subject Three was a 34 year old female and a veteran teacher of thirteen years experience at this school. This subject was teaching in a suburban school with a middle class SES, a racial balance of approximately 10% black, 90% white, and an enrollment of 700 students.

A kindergarten class was selected for observation in this school. This class contained approximately 24 students. Three students were randomly selected from a list of students who had high attendance. The selected students were a white female, a white male and a black female. This teacher and selected students were observed during the early

afternoon hours, three or four times a week for a ten week period, totaling 26 observations.

Subject Four was a 38 year old female teaching at the elementary level for her second year. This teacher had several years of teaching experience at both the middle and senior high level and was completing a Master's program in Administration during this study. This suburban school had a middle class SES, a racial balance of approximately 10% black, 90% white and an enrollment of 700 students.

A fifth grade class containing approximately 31 students was selected for observation in this school. Three students were randomly selected from students who had high attendance. A white male, a white female and a black male were the selected students. This teacher and selected students were observed three or four times a week for ten weeks totaling 25 observations.

In conclusion, these subjects were selected because their school had two physical education teachers and both teachers were willing to become either an observer or the teacher who would allow observers to come into their classrooms and submit to a series of interventions designed to change various teaching behaviors. Each subject received a letter (see Appendix A) and a follow-up telephone call by the investigator to confirm willingness to participate in the study and what role each teacher would assume. The principals at each school also received a letter (see Appendix B) and a follow-up telephone call. Table 1 summarizes the background data for each subject including age, sex, location and SES of school, grade level, number in class and approximate length of units taught.

Table 1

Background Data for Subjects of the Study

Subject	Age/Sex	Location/SES	Grade	Class Size	Length of Units Taught
1	26/F	Suburban/lower middle	1st	34	One day
2	36/F	Suburban/lower middle	3rd	26	Three days
3	34/F	Suburban/middle	K	24	One Day
4	38/F	Suburban/middle	5th	31	7 - 10 days

Observation Instrument

The first ALT-PE (Academic Learning Time-Physical Education) recording instrument was developed and field-tested in physical education classrooms during the 1978-1979 school year (Siedentop, Birdwell, Metzler, 1978). Birdwell (1980) adapted the ALT-PE instrument to include a measure of teacher behavior according to the original BTES instrument. This then became the ALT-PE Teacher Behavior Observation System.

Through actual use of the original ALT-PE observation instrument, it was determined that certain revisions were necessary. In 1982, Siedentop, Tousignant and Parker revised the Academic Learning Time-Physical Education instrument. It is the 1982 revised ALT-PE instrument that was used in this study.

The ALT-PE instrument is based on an interval recording system. Interval recording is an observation technique where an individual or group is observed for a short, specified length of time, an interval, and a decision is made as to what behavioral definition best describes

the behavior of the individual or group during that time. These intervals are repeated throughout the entire observation session.

However, an interval recording system does cause some trials of each target student to remain unobserved. Therefore, care must be taken in interpreting the findings, so as not to imply a strong relationship between ALT-PE and student motor skill acquisition.

The interval observation technique used in this study utilized an "observe" - "record" format in that one interval is used to "observe" the subject(s) and the next interval is used to "record" the observations. The interval duration used in this study had an eight second observe, eight second record format. It was used for on-site observation of student behavior.

Academic Learning Time-Physical Education is a multi-faceted system of 21 categories. The categories are divided among two levels. The two levels use a hierarchical decision system. Each decision takes place at a different level within the interval, and each interval contains a set of behavioral definitions to describe what was seen during a given interval. The purpose of the system is to describe reliably and validly a physical education lesson as it utilizes class time in a manner conducive to improvements in student skill acquisition.

The first level of decision making focuses on the class as a whole (or a subset of the class) and is designed to describe the context within which student behavior is occurring. There are three major subdivisions at the context level -- general content, subject matter knowledge content, and subject matter motor content. General and subject matter content categories form a facet (Dunkin and Biddle, 1974) in that

all activity has to be codeable into a category that is either general content or subject matter content.

Context Level Subdivisions

General Content - refers to class time when students are not intended to be involved in physical education activities.

Subject Matter Knowledge Content - refers to class time when the primary focus is on knowledge related to physical education content.

Subject Matter Motor Content - refers to class time when the primary focus is on motor involvement in physical education activities.

Each of the three main subdivisions at the context level has categories which describe more specifically the nature of the setting within which individual student behavior is occurring. These categories are defined as follows:

General Content Categories

Transition (T) - Time devoted to managerial and organizational activities related to instruction such as team selection, changing equipment, moving from one space to another, changing stations, teacher explanation of an organizational arrangement, and changing activities within a lesson.

Management (M) - Time devoted to class business that is unrelated to instructional activity such as taking attendance, discussing a field trip, lecturing about appropriate behavior in the gymnasium, or collecting money for the yearbook.

Break (B) - Time devoted to rest and/or discussion of nonsubject matter related issues such as getting a drink of water, talking about last

night's ball game, telling jokes, celebrating the birthday of a class member, or discussing the results of a student election.

Warm Up (WU) - Time devoted to routine execution of physical activities whose purpose is to prepare the individual for engaging in further activity, but not designed to alter the state of the individual on a long term basis, such as a period of light exercise to begin a class, stretching exercises prior to a lesson, or a cooling down activity to terminate a lesson.

The subject matter content is subdivided into two areas, knowledge content and motor content. These two subdivisions also form a facet, in that all physical education content has to be classifiable into the knowledge or motor category. These categories are defined as follows:

Subject Matter Knowledge Categories

Technique (TN) - Time devoted to transmitting information concerning the physical form (topography) of a motor skill such as listening to a lecture, watching a demonstration, or watching a film.

Strategy (ST) - Time devoted to transmitting information concerning plans of action for performing either individually or as a group such as explanation of a zone defense, demonstration of an individual move or discussion of how best to move the ball down a field.

Rules (R) - Time devoted to transmitting information about regulations which govern activity related to the subject matter such as an explanation of the rules of a game, a demonstration of a specific rule violation, or viewing a film depicting the rules of volleyball (time devoted to transmitting information about rules governing general student behavior in physical education are coded management).

Social Behavior (SB) - Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity such as explanation of what constitutes sportsmanship in soccer, discussion of the ethics of reporting one's own violations in a game, or explanations of proper ways to respond to officials in a game.

Background (BK) - Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

Subject Matter Motor Categories

Skill Practice (P) - Time devoted to practice of skills or chains of skills outside the applied context with the primary goal of skill development, such as a circle drill in passing a volleyball, one against one practice of dribbling a basketball, exploration of movement forms, practicing the schottishche step, or practicing a particular skill on a balance beam.

Scrimmage/routine (S) - Time devoted to refinement and extension of skills in an applied setting (in a setting which is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants -- such as, a half court five on five basketball activity, the practice of a complete free exercise routine, six against six volleyball (all with instructions, suggestions, and feedback during the scrimmage).

Game (G) - Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach -- such as a volleyball game, a complete balance beam routine, the performance of a folk dance, or running a half-mile race.

Fitness (F) - Time devoted to activities whose major purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility such as aerobic dance, distance running, weight lifting, or agility training (the activities should be of sufficient intensity, frequency, and duration so as to alter the state of the individual).

The second level of decision making focuses on the individual learner(s) and is designed to describe the nature of the learner(s) involvement in a more specific way. The learner involvement decision is made by observing individual students. While the first level context decision focused on the class as a whole, requiring only one judgment representing the entire group observed, the decision at the learner involvement level requires separate judgments for each student included within the observation sample. The learner involvement level has two sets of categories which form a facet, meaning that everything individual students are doing has to be classifiable into one of the categories. One set of categories is subsummed under the descriptor not motor engaged. A second set of categories is subsummed under the heading motor engaged. The term "motor" as used in the learner involvement level categories refers to motor involvement with subject matter activities related to the goals of the setting. Thus, the categories under

the heading not motor engaged may include motor activity, but not subject matter oriented motor activity. These categories are defined as follows:

Not Motor Engaged - refers to all involvement other than motor involvement with subject matter oriented motor activities.

Motor Engaged - refers to motor involvement with subject matter oriented motor activities.

Each of the two main subdivisions at the learner involvement level has categories which describe more specifically the nature of the learner's involvement. These categories are defined as follows:

Not Motor Engaged Categories

Interim (I) - The student is engaged in a noninstructional aspect of an ongoing activity such as retrieving balls, fixing equipment, retrieving arrows, or changing sides of a court in a tennis match.

Waiting (W) - The student has completed a task and is awaiting the next instructions or opportunity to respond such as waiting in line for a turn, having arrived at an assigned space waiting for the next teacher direction, standing on a sideline waiting to get in a game, or having organized into the appropriate formation waiting for an activity to begin.

Off-task (OF) - The student is either not engaged in an activity he/she should be engaged in or is engaged in activity other than the one he/she should be engaged in -- behavior disruptions, misbehavior, and general off-task behavior, such as talking when a teacher is explaining a skill, misusing equipment, fooling around, fighting, or disrupting a drill through inappropriate behavior.

On-task (ON) - The student is appropriately engaged carrying out an assigned non-subject matter task (a management task, a transition task, a warm up task) such as moving into squads, helping to place equipment, counting off, doing warm up exercises, or moving from the gym to the playing field.

Cognitive (C) - The student is appropriately involved in a cognitive task such as listening to verbal instructions about how to organize, watching a demonstration, participating in a discussion, or watching a film.

Motor Engaged Categories

Motor appropriate (MA) - The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.

Motor inappropriate (MI) - The student is engaged in a subject matter oriented motor activity but the activity-task is either too difficult for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.

Supporting (MS) - The student is engaged in subject matter motor activity such as spotting in gymnastics, feeding balls to a hitter in a tennis lesson, throwing a volleyball to a partner who is practicing set up passing, or clapping a rhythm for a group of students who are practicing a movement pattern.

To review, the ALT-PE system involves a group-focus context decision and an individually focused learner involvement decision for each observation sample. Those observation samples in which a subject matter content motor category is chosen at the context level and motor

appropriate is chosen at the learner involvement level are ALT-PE samples.

It then becomes very important that each observer be familiar with the observed activities before him/her, as well as the general levels of performance based on the age and skill of the observed student. For this reason, only observers who are familiar with the content area of physical education were chosen for the study.

Category systems require that observers be able to discriminate among a group of related behaviors. The category chosen by the observer to represent the behavior of a group or an individual student is transferred to a coding sheet. The coding sheets used as the recording instrument in this study are shown in Figure 5. The first page gathers demographic information of the observation. The second page has space on each sheet to record 156 samples of behavior. Since three students were selected for observation, the first row of intervals was assigned to student #1, the second row to student #2, and the third row to student #3, repeating the system for the next rows. The actual coding moves down columns before moving across rows.

The categories are written at the bottom of the coding sheet with a symbol for each category. The appropriate symbol is written in the appropriate box for each observation inverval.

For each observation interval, the context is first noted and then the specific student is observed to ascertain the nature of his/her involvement. These observations are then transferred to the coding sheet during the "record" part of the interval, utilizing the symbol system.

To allow for mobility and to ensure accurate timing for each interval, a portable cassette tape player was used to cue the observer for

ALT-PE CODING SHEET
DEMOGRAPHIC INFORMATION

Date: _____ Teacher: _____ School: _____

Class/Activity: _____ Observer: _____

Start Time: _____ Stop Time: _____ Duration: _____ Page _____ of _____

This observation is day _____ of _____ days in this unit. Format

The teacher allocated _____ minutes of activity time for this lesson. _____ second observe.

The source of this allocation information was: asked teacher / saw lesson plan. _____ second record.
circle one

Observer comments on this class:

_____

_____

_____

_____

_____

_____

Data Summary:

Total Time _____ Allocated practice time _____ ALT-PE % _____ = _____%

Context level data: General content_____ = _____% SM Knowledge_____ = _____% SM Motor_____ = _____%

Learner involvement data: Not motor engaged: _____ = _____% Motor engaged: _____ = _____%

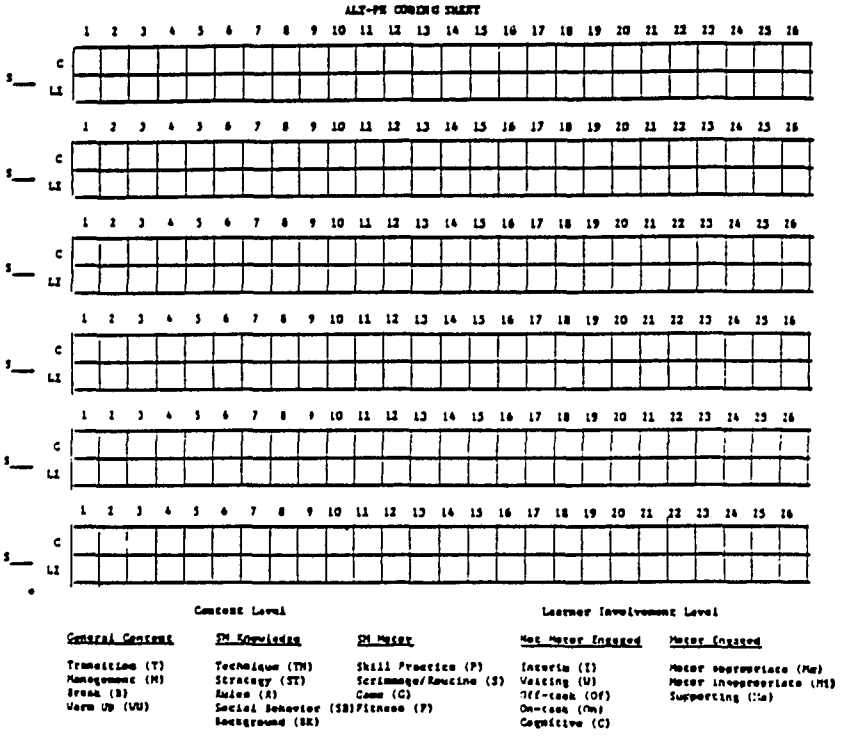


Figure 5. Sample Coding Sheets

observation and recording. Figure 6 illustrates the cuing sequence. The observer first heard the number of the target student and then the interval number so as to facilitate proper observation and recording. No rest was programmed into the sequence, however, observers could take a break as they rewind the tape to begin coding again.

The observers used ear jacks for listening to the cuing so that the audio tape did not interfere with the class. When two observers were employed simultaneously for a reliability check, a spliced ear jack was used to ensure that both observers were recording in identical intervals in the sequence.

Target Student Interval

"Observe One - One," "Record One - One," "Observe Two - One," "Record Two - One," "Observe Three - One," "Record Three - One"... "Observe One - Twenty-six," "Record One - Twenty-six," "Observe Two - Twenty-six," "Record Two - Twenty-six," "Observe Three - Twenty-six," "Record Three - Twenty-six."

Figure 6

Cassette Tape Recorder Program Format for Observation with the Academic Learning Time-Physical Education System

Description and Training of Observers

Four individuals collected data for this study. All four individuals were elementary physical education teachers at the school where they observed the subjects involved in the study. The investigator functioned primarily as a reliability checker, however, she did collect some solo data due to one observer leaving a school. This observer did return to conduct a reliability check with the investigator.

Three of the observers were female and one was male. None of the observers had previous experience in observational recording.

Training procedures commenced four weeks prior to the collection of data in the field. The following list describes the steps followed during the training of the observers.

1. Each observer was provided with a manual explaining the ALT-PE Observation System including the definitions of all categories, training tasks in step-wise fashion, a copy of the coding conventions and a decision log (see Appendix C). Observers were given five days to familiarize themselves with the contents of the manual and complete tasks 1 through 3.
2. Observers were provided with written behavioral definitions that appeared in the manual they studied. For task 1, beside each definition, observers were required to write the appropriate symbol. When the observers could place the appropriate symbol next to the definitions with 100% accuracy, they moved on to task 2.
3. Observers were provided with behavioral vignettes describing what the group is doing (context level) and what a hypothetical individual student is doing (learner involvement level). For task 2, the observers were to assign the behaviors in the vignette to the appropriate context and learner involvement categories, utilizing the symbol system. When the observers could identify 90% of the examples correctly, then they moved on to task 3.
4. Observers were provided with an ALT-PE coding sheet and observations for three hypothetical target students. For task 3

the observers were to enter the proper symbol in the appropriate interval box. This task was to be done with 100% accuracy.

5. Once each observer was able to complete tasks 1 through 3 according to the criteria, training sessions were begun in the home of the investigator. During the first session, in order to enable each observer to feel comfortable with the ALT-PE system and the interval recording sequence, the observer and investigator practiced coding a videotape focusing on only one student. The tape would be stopped frequently to clear up questions regarding appropriate coding.

6. Once observers were comfortable with the coding format, each would code one student on a ten minute video tape using a 10 second observe, 20 second record series. The tape was first viewed and coded using only the context categories. Then the tape was viewed a second time and only learner involvement categories were coded. Results were compared on an interval by interval basis with the investigator's coding. Once observers could achieve 80% agreement, then they moved on to the next task.

7. A twenty minute video tape with two students to view was presented to the observers. A 10 second observe. 15 second record series was used. The observers viewed the entire tape, coded both levels with two students and compared the result with the investigator. When a 75% reliability according to the Scored Interval Technique (see section on Inter-observer

Agreement) was achieved then the tape was repeated with an 8 second observe, 10 second record format. Again, 75% reliability was the criterion for moving on to the 6 second observe, 8 second record format.

8. The observers then viewed a different twenty minute video tape of two different students. A 6 second observe, 8 second record series was used. When a 75% reliability was achieved, then the observers were ready to move on to the next task.

9. When observers were able to obtain criterion in the video taped setting, they were then required to demonstrate acceptable reliability of 80% in a live setting. Observations were made in the elementary school where the study was conducted. The following progression was used and acceptable criterion was calculated on each.

   (a) Code one student with a 6 second observe, 8 second record format.

   (b) Code two students and alternate intervals with a 6 second observe, 8 second record format.

   (c) Code three students and alternate intervals with a 6 second observe, 8 second record format.

No observer was allowed to begin data collection in the field until this final task was reached on two successive sessions. Following training, each observer was given the class and target students to code. The coding sheets were returned daily to or picked up by the investigator. Procedures for obtaining inter-observer agreement are discussed in the following section.

Inter-observer Agreement

Much has been written in the recent literature regarding determination of the reliability of data collected with interval recording instruments (Johnson and Bolstad, 1973; Hawkins and Dotson, 1975). The consensus of the reviews is that no single reliability method can be used adequately to estimate inter-observer agreement in all interval recording instruments (Hawkins and Dotson, 1975). It is apparent that each of the several methods identified has obvious assets and liabilities, most of which depend on the amount of behavior occurring.

The procedure for obtaining inter-observer agreement in both the training phase and data collection phase was as follows:

1. A split ear jack was connected to the cassette deck so both observers could hear the cues at the same interval.
2. Inter-observer agreement estimates were obtained by comparing codes for each observer using a Scored-Interval procedure (Hawkins and Dotson, 1975; Metzler, 1979; Birdwell, 1980).
3. In this Scored-Interval method, those intervals in which at least one of the observers recorded the presence of the target variable were identified as the scored intervals. Those intervals where neither observer recorded the presence of the variable were ignored.
4. The scored intervals were compared on an interval by interval basis to determine the number of intervals in which the independent observers agreed or disagreed.
5. Having counted the agreements and disagreements in the scored intervals, the percent agreement was obtained by using the following formula:

$$\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \%\text{ of Agreements}$$

The results of the Inter-observer Agreement checks in training and in the field observations are reported in Chapter IV.

The following steps were observed during the course of this study to aid in ensuring accurate and reliable data collection:

1. Comprehensive observer training as has been previously outlined.
2. Inter-observer Agreement estimates across the observation schedule: Inter-observer Agreement was checked across the entire length of the observation schedule both during baseline and phase 1 of the intervention.
3. Periodic retraining: Each observer received a brief retraining session during the course of the study which simply consisted of an individual meeting with the investigator and an updating of the current decision log being used (see Appendix D).

Intervention and Design of the Study

Given the assumption that changes in student academic learning time (ALT-PE) will be a function of changes in teacher behavior, this intervention was designed to change certain teacher behaviors and/or classroom conditions using baseline data from the observational instrument to guide the intervention.

Before collecting baseline data, it was hypothesized that low ALT-PE might be associated with some of the following teaching characteristics or classroom conditions:

1. Frequent and prolonged managerial and transitional episodes;
2. Instructional time exceeding allocated practice time;
3. High rates of student non-engagement consisting of waiting in line or off-task behavior;
4. Student engaged time, but at too hard or too easy difficulty level.

At the beginning it was determined that any technique utilized to increase student ALT-PE would have to have a low response cost for teachers, otherwise the behaviors would not be maintained in the teaching environment (Siedentop, Birdwell, and Metzler, 1978). Therefore, a series of brief, inexpensive mini-clinics were conducted at the home or school of the subjects during each phase of the intervention and daily systematic feedback was conducted via telephone calls.

Subjects one, two and three were involved in separate replications of one study in which two phases of a behavioral intervention was utilized. A multiple baseline design across behaviors within each school was utilized to investigate functional relationships.

The protocol for these three replications appears in Figure 7.

Subject One	Subject Two	Subject Three
Intervention	Intervention	Intervention
Phase	Phase	Phase
#1-Transition Time	#1-Transition Time	#1-Waiting Time
#1-Waiting Time	#1-Waiting Time	#1-Transition Time
#2-Transition and Waiting below preset criterion level	#2-Transition and Waiting below preset criterion level	#2-Transition and Waiting below preset criterion level

Figure 7. Multiple Baseline Protocol

Phase 1 of the intervention on transition and waiting time was based on the baseline data. Transition time was retrieved from the coding instrument by counting the number of intervals in which Transition (T) was recorded on the Context Level. This was then divided by the total number of intervals to arrive at a percentage of intervals of transition.

Waiting time was retrieved from the coding instrument by counting the number of intervals in which Waiting (W) was recorded on the Learner Involvement Level. This was then divided by the total number of intervals to arrive at a percentage of intervals of waiting.

Phase 2 of the intervention was based upon the percentage of intervals for waiting and transition time, as well as the demographic information collected, and a preset criterion level was given to the subjects to try and remain below. At this time, the subjects kept a daily log of their concerns, objectives and reactions to the lessons.

A multiple baseline design of one behavior across settings was utilized as subsequent phases of the intervention were made on subjects 1, 2, 3, and 4. Results of these studies and graphic presentations are included in the next chapter.

Therefore, the major dependent variables in this study were transition and waiting time. ALT-PE was examined via a concurrent baseline but was not directly intervened upon.

The independent variable or intervention consisted of short mini-clinics in which each subject was initially presented with the learning packet in Appendix E. After allowing the subject to read the packet and ask questions, the first behavior targeted for change was introduced.

This behavior or classroom condition change was presented to the teacher using the form in Appendix E. Suggestions were made regarding procedures to implement change within the lessons.

As an example, when intervening on transition time for subjects 1, 2, and 3, the suggestion of having the classroom set up prior to the lesson was made. Suggestions were made regarding implementation according to each lesson through daily systematic feedback via the telephone. This daily systematic feedback was an important facet in the intervention regarding class performance and the graphing of progress. Before the next teaching session, subjects were provided with a percentage which they would graph on a form provided by the investigator. Subjects were not given feedback on the ALT-PE variable. Again, suggestions would also be made regarding procedures to implement in the next lesson. This varied from teacher to teacher and is explained in greater detail in Chapter IV.

As each new intervention phase began, the investigator would repeat the procedure of meeting with the subject at their home or school and present a new behavior to target for change. Again, the graphing procedure was stressed and subjects continued to graph all previous behaviors that had been subject to prior intervention.

Phase 2 of the intervention continued the daily systematic feedback with suggestions for change from Phase 1 of the intervention. However, a criterion level was added as a target for the teachers to try and remain under. In addition, the teachers logged daily concerns, objectives and reactions.

Methods of Data Analysis

Typically operant researchers have relied heavily on visual inspections of their data when making inferences regarding the effectiveness of their studies. This researcher attempts to draw inferences about the various changes from phase to phase in this study utilizing visual inspection and the actual percentage of total intervals for the categories displayed in Tables 1 through 20 in the next chapter. Percent of total intervals for each was obtained by counting the number of intervals for each behavior, and then dividing that figure by the total number of coded intervals in that category.

The qualitative data collected will be used to aid in explanations of the quantitative data. Daily demographic information concerning the observation and the subjects written log of concerns, objectives and reactions of the lesson are used.

Summary

This chapter described the subjects and the setting in which those subjects were observed. Next, a thorough discussion of the 1982 ALT-PE system was presented which included the precise behavioral definitions employed in the instrument. A description of the training of observers and inter-observer agreement methods for observers were also presented. The phases of the intervention and design of the study were described, and the major variables of interest carefully indicated. The chapter concluded with a brief discussion of the methods of data analysis. Chapter IV will present the results of this study.

CHAPTER IV

ANALYSIS AND DISCUSSION OF THE DATA

This chapter reports the results of the intervention on the teaching and student behaviors of the four teachers who were subjects for this study. The first section of this chapter presents the results of the ALT-PE observation system inter-observer agreement calculations. A short discussion of the inter-observer agreement calculations follows.

The second section presents the data. The mean changes of the data between baseline and the phases of the intervention are reported through tables and visual inspection of graphs. Included in this section are results of the three replications of a multiple baseline design across two behaviors, results of the two replications of a multiple baseline design of one behavior across the teaching setting, results of the concurrent baseline variable ALT-PE and the qualitative data of teachers' logged concerns, priorities of the lesson, and reactions to the study.

The final section presents the data discussion. This section follows the same format used in the data presentation.

Inter-observer Agreement

Inter-observer agreement was checked for subjects 1, 2, and 3 at least once per baseline, phase 1 of the intervention on transition and phase 1 of the intervention on waiting time for a total of three times. On subject 4, inter-observer agreement was checked during baseline and

phase 1 of the intervention on waiting only. The investigator was also teaching school while conducting this study and therefore could not do an inter-observer agreement check during phase 2 of the intervention. Each observer was checked for inter-observer agreement three times in each setting. A total of eleven inter-observer agreement checks were made which included 32 individual checks on target students.

Tables 2 through 5 present the scored interval agreement percentages for the behavioral categories and for the concurrent variable ALT-PE. The reader is directed to Chapter III for the names of the behavioral categories that correspond to the coding symbols displayed in the tables. An agreement percentage with an (*) denotes a category that did not meet the acceptable criterion level of Scored-Interval agreement, which for this study was 75%. A category marked (-) denotes that the behavior was observed less than eight times or was not recorded by either observer.

Inter-observer Agreement Discussion

Based upon the results of the Scored-Interval inter-observer agreement percentages, it appears that the ALT-PE observation system and data collection procedures were reliable sources of data. It was calculated that 97% of all individual behavior category Scored-Interval agreement percentages were at or above the criterion level of acceptance previously established.

Table 2

Scored-Interval Inter-observer Agreement
Percentage for School 1

Category	Reliability Checks			Total
	1	2	3	
General Content	100	92	100	97.3
(T)	100	92	100	97.3
(M)	100	-	-	100.0
(B)	-	-	-	-
(WU)	-	-	-	-
Subject Matter Knowledge	100	88	95	94.3
(TN)	100	100	100	100.0
(ST)	-	-	-	-
(R)	-	-	-	-
(SB)	100	-	-	100.0
(BK)	-	-	-	-
Subject Matter Motor	96	100	96	97.3
(P)	96	100	96	97.3
(S)	-	-	-	-
(G)	-	100	-	100.0
(F)	-	-	-	-
Not Motor Engaged	93	92	89	91.3
S-1	95	88	88	90.3
S-2	91	88	84	87.6
S-3	Absent	100	93	96.5
(I)	100	-	-	100.0
(W)	93	100	96	96.3
(OF)	-	-	-	-
(ON)	-	80	95	87.5
(C)	100	100	91	97.0
Motor Engaged	93	100	88	93.6
S-1	88	100	100	96.0
S-2	100	100	-	100.0
S-3	Absent	100	100	100.0
(MA)	100	100	88	96.0
(MI)	-	100	-	100.0
(MS)	100	-	-	100.0
ALT-PE	100	100	88	96.0
S-1	100	100	100	100.0
S-2	100	100	-	100.0
S-3	Absent	100	100	100.0

(*) Denotes a percentage below criterion level.
(-) Denotes the behavior was not recorded by either observer or occurred less than eight times.

Table 3

Scored-Interval Inter-observer Agreement Percentage for School 2

Category	Reliability Checks			
	1	2	3	Total
General Content	70*	100	93	87.6
(T)	70*	100	89	86.3
(M)	-	-	-	-
(B)	-	100	-	100.0
(WU)	-	-	100	100.0
Subject Matter Knowledge	100	-	100	100.0
(TN)	100	-	100	100.0
(ST)	-	-	-	-
(R)	-	-	-	-
(SB)	-	-	-	-
(BK)	-	-	-	-
Subject Matter Motor	100	100	100	100.0
(P)	100	-	100	100.0
(S)	100	-	-	100.0
(G)	-	-	-	-
(F)	-	100	-	100
Not Motor Engaged	88	100	91	93.0
S-1	94	100	87	93.6
S-2	88	100	100	96.0
S-3	94	100	86	93.3
(I)	-	-	75	75.0
(W)	88	100	100	96.0
(OF)	-	-	75	75.0
(ON)	-	100	91	95.5
(C)	100	-	100	100.0
Motor Engaged				
S-1	100	100	100	100.0
S-2	100	100	100	100.0
S-3	100	100	100	100.0
(MA)	100	100	100	100.0
(MI)	-	-	-	-
(MS)	-	-	-	-
ALT-PE	100	100	100	100.0
S-1	100	100	100	100.0
S-2	100	100	100	100.0
S-3	100	100	100	100.0

(*) Denotes a percentage below criterion level.
(-) Denotes the behavior was not recorded by either observer or occurred less than eight times.

Table 4

Scored-Interval Inter-observer Agreement Percentage for School 3

Category	Reliability Checks			
	1	2	3	Total
General Content	94	100	-	97.0
(T)	94	100	-	97.0
(M)	-	-	-	-
(B)	-	-	-	-
(WU)	-	-	-	-
Subject Matter Knowledge	100	100	100	100.0
(TN)	100	100	-	100.0
(ST)	-	-	-	-
(R)	-	-	-	-
(SB)	-	-	-	-
(BK)	-	-	-	-
Subject Matter Motor	94	97	100	97.0
(P)	94	97	100	97.0
(S)	-	-	-	-
(G)	-	-	-	-
(F)	-	-	-	-
Not Motor Engaged	62*	77	-	69.5*
S-1	84	80	100	88.0
S-2	60*	75	-	67.5*
S-3	62*	100	100	87.3
(I)	-	100	-	100.0
(W)	71*	66*	100	79.0
(OF)	-	100	-	100.0
(ON)	88	100	-	94.0
(C)	100	77	100	92.3
Motor Engaged	100	97	100	99.0
S-1	100	100	100	100.0
S-2	100	100	97	99.0
S-3	100	100	97	99.0
(MA)	100	100	98	99.3
(MI)	-	100	100	100.0
(MS)	-	-	-	-
ALT-PE	100	100	100	100.0
S-1	100	100	97	99.0
S-2	100	100	98	99.3
S-3	100	100	100	100.0

(*) Denotes a percentage below criterion level.
(-) Denotes the behavior was not recorded by either observer or occurred less than eight times.

Table 5

Scored-Interval Inter-observer Agreement Percentage for School 4

Category	Reliability Checks		
	1	2	Total
General Content	100	93	96.5
(T)	100	93	96.5
(M)	-	-	-
(B)	-	-	-
(WU)	-	-	-
Subject Matter Knowledge	100	83	91.5
(TN)	100	83	91.5
(ST)	-	-	-
(R)	-	-	-
(SB)	-	-	-
(BK)	-	-	-
Subject Matter Motor	100	100	100.0
(P)	100	-	100.0
(S)	-	-	-
(G)	-	100	100.0
(F)	-	-	-
Not Motor Engaged	84	91	87.5
S-1	77	96	86.5
S-2	92	90	91.0
S-3	88	93	90.5
(I)	70*	-	70.0*
(W)	98	100	99.0
(OF)	75	-	75.0
(ON)	86	77	81.5
(C)	90	100	95.0
Motor Engaged	93	94	93.5
S-1	100	96	98.0
S-2	100	95	97.5
S-3	86	90	88.0
(MA)	100	93	96.5
(MI)	-	-	-
(MS)	75	94	84.5
ALT-PE	100	93	96.5
S-1	100	100	100.0
S-2	100	88	94.0
S-3	100	88	94.0

(*) Denotes a percentage below criterion level.
(-) Denotes the behavior was not recorded by either observer or occurred less than eight times.

Data Presentation

As cited previously in Chapter III, subjects 1, 2, and 3 were involved in three separate replications of one study in which two behavioral phases of the intervention were utilized. A multiple baseline design across behaviors within each school was utilized to investigate functional relationships. In addition a multiple baseline design of one behavior across settings was utilized to show the functionality of the intervention by demonstrating that the intervention produced a similar behavior change across each setting.

School 1

Teacher One, as described in Chapter III, taught for ten weeks in a lower middle SES elementary school to a large class of first graders. The units were one or two days in length and varied throughout the study (see Appendix G, Table 21 - Observation Analysis).

After six days of baseline observation, the first behavior was targeted for intervention. Table 6 shows the change from a baseline mean percentage of 40.5 intervals of transition to Phase 1 intervention mean of 20.

Table 6. Mean Percentage Intervals of Transition Time - School 1

	School 1	
Behavior	Baseline $\bar{X}$	Phase 1 Intervention $\bar{X}$
$\bar{X}$ percentage intervals of Transition Time	40.5	20

This reduction in transition time can also be observed in the first tier on the graph in Figure 8.

The second behavior targeted for change was student waiting time. Table 7 shows the change from a baseline mean of 33.6 intervals of waiting to Phase 1 intervention mean of 14.

Table 7. Mean Percentage of Waiting Time Intervals of Three Target Students - School 1

	School 1	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage of Waiting Time intervals of three target students	33.6	14

Visual inspection of the second tier of the graph in Figure shows a decrease in the waiting time by the three targeted students.

The second phase of the intervention of keeping transition time and waiting time below a preset criterion level was targeted. These behaviors were chosen as the target for change since these seemed to be the main areas of concern in the data (see Appendix G, Table 21). This was a larger than usual class (34 students), and an interpretation of the data justified a maximum of 13 percentage intervals for each transition time and waiting time. This preset standard was for the teacher to consciously try to stay under. Table 8 displays the means decrease in percentage of intervals from the Phase 1 intervention mean to the Phase 2 intervention mean. Figure 8 demonstrates a visual decrease of these behaviors in the first and second tier.

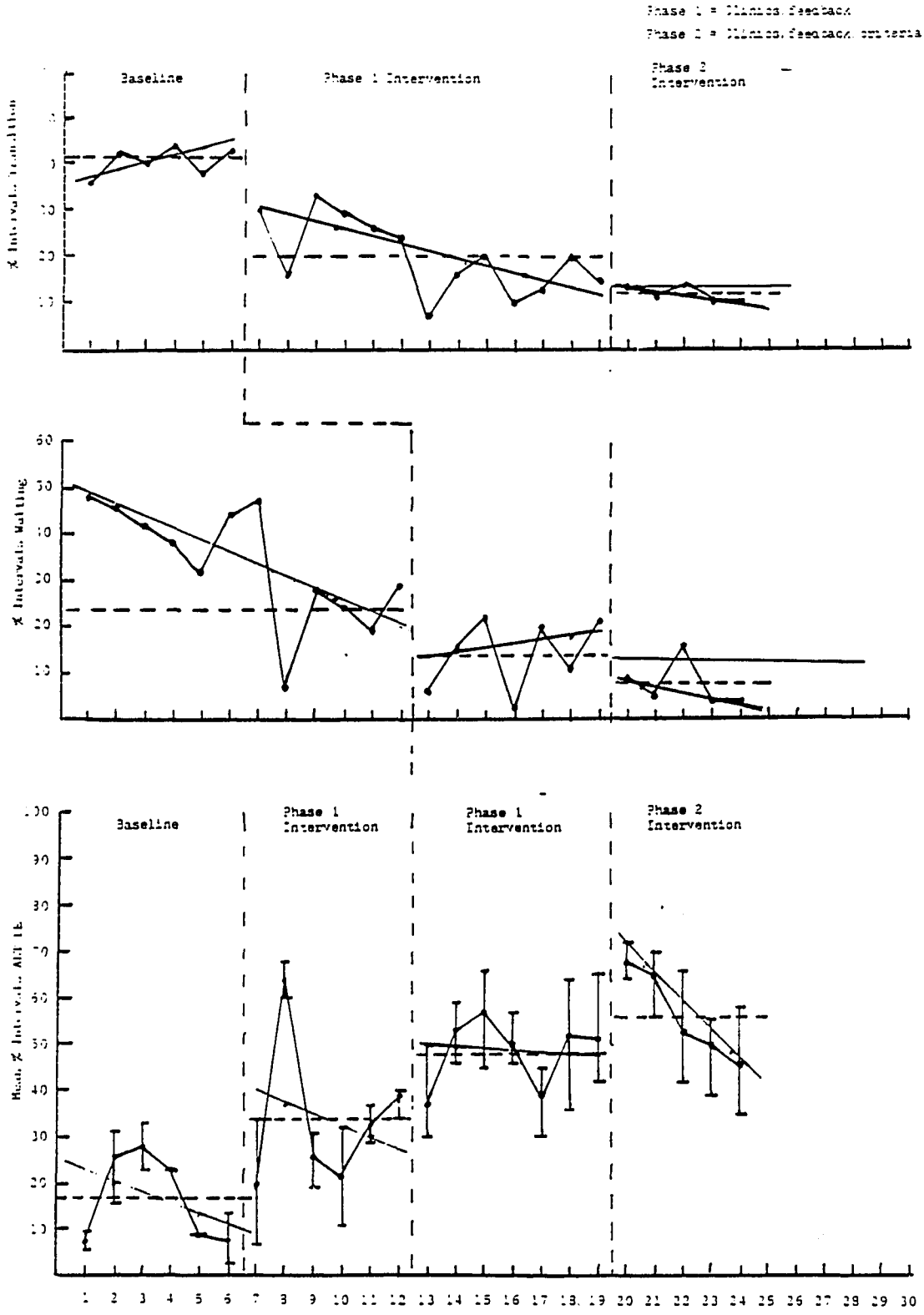


Figure 8. Graph of percentage of Intervals of Transition, Waiting, and ALT-PE for School 1.

Table 8. Mean Percentage Intervals - Transition Time and Waiting Time - School 1

	School 1	
Behavior	Phase 1 Intervention $\overline{X}$	Phase 2 Intervention $\overline{X}$
$\overline{X}$ percentage of Transition Time intervals	20	11.6
$\overline{X}$ percentage of Waiting Time intervals of three target students	14	7.6

During the time that the preset criterion level was targeted for change, the teacher kept a daily log of concerns and priorities of the lessons. The teacher also wrote a reaction to the study and the concept ALT-PE and the conclusion of the study. The following was expressed by Teacher One:

(1) A general feeling of being rushed into getting class started, giving directions and handing out equipment.

(2) Few chances for the students to socialize unless involved in a partner activity. Physical Education at this school is one of the student's opportunities to interact socially. There is very limited time before school and during lunch for interaction.

(3) Physical Education should be geared towards developing skills but feel there are certain benefits of waiting. First, students need to learn to take turns and develop patience. Second, while

students wait, they have the opportunity to observe other students perform the skills.

(4) Skills as a teacher improved. More time was taken to mentally prepare lessons and presentation of the lesson was more effective.

(5) Programs improved by keeping activity areas adjacent to each other and by trying new lessons involving a higher level of student involvement.

(6) Fewer discipline problems and more on-task behavior was the result of the study.

School 2

Teacher Two taught for ten weeks a class of third graders covering units which were on the average of three days in length (see Appendix G, Table 22, Observation Analysis). Some units were only one or two days long.

After eleven days of baseline observation, intervention began (see tier 1 on graph in Figure 9). Like Teacher One, the data showed transition time as this teacher's main area of concern. Table 9 shows the change from a baseline mean percentage of 21.6 intervals of transition to a Phase 1 intervention mean of 12.

Table 9. Mean Percentage Intervals of Transition Time - School 2

	School 2	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage intervals Transition Time	21.6	12

The second behavior targeted for intervention was student waiting time. A mean percentage of waiting time intervals of 13 percent (see Table 10) would normally be considered an acceptable level, however, it was still targeted for change. There was a change from a baseline mean percentage of 13 to a Phase 1 intervention mean of 8. The second tier of the graph in Figure 9 demonstrates the already low amount of waiting time and still a decrease in student waiting time occurred.

Table 10. Mean Percentage of Waiting Time Internals of Three Target Students - School 2

	School 2	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage of Waiting Time Intervals of three target students	13	8

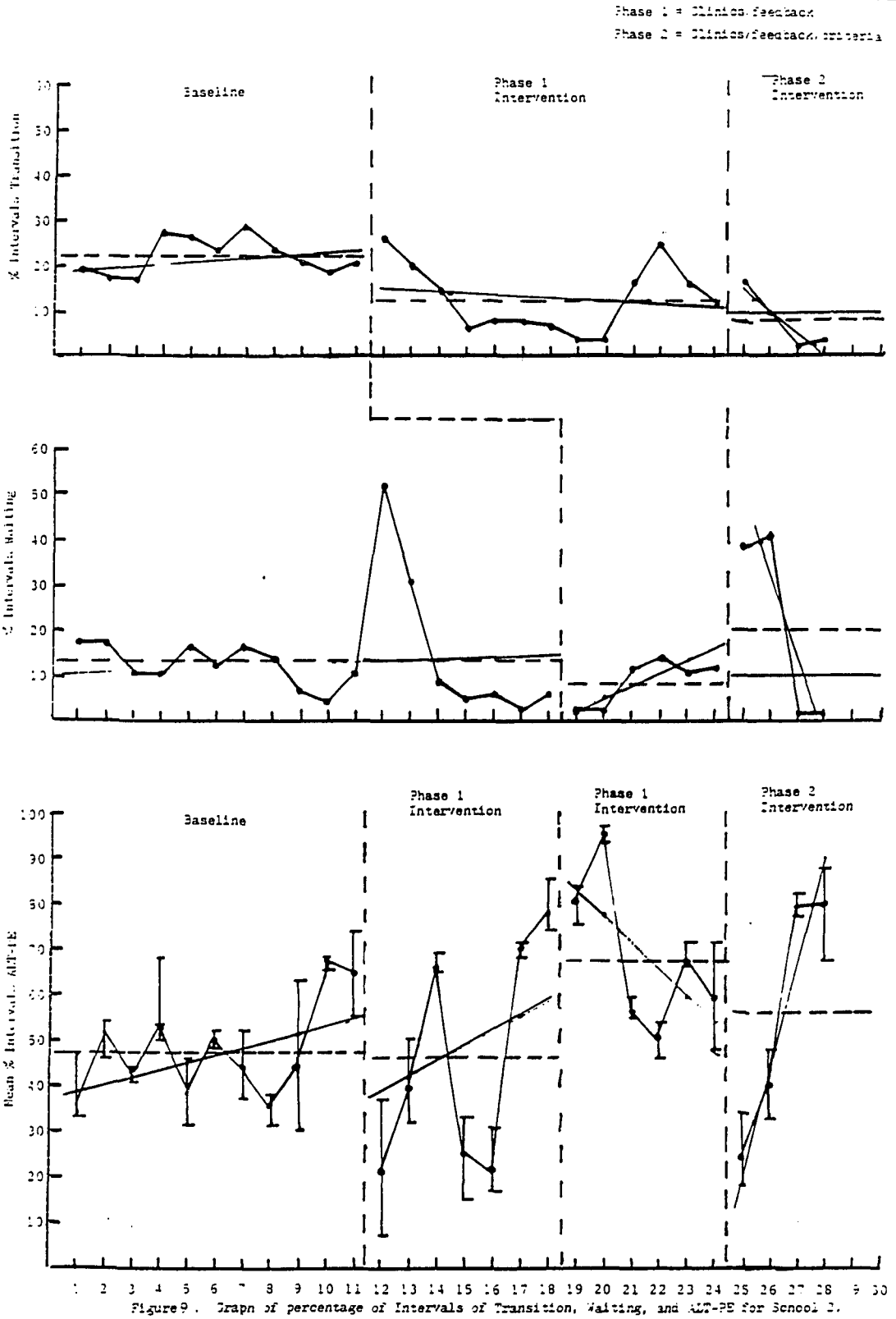


Figure 9. Graph of percentage of Intervals of Transition, Waiting, and ALT-PE for School 2.

The second phase of the intervention targeted for change, as for Teacher One, was keeping transition time and waiting time below a preset criterion level. This was chosen because on the twenty-first observation and the observations following, the data showed an increase in transition and waiting time (see the first and second tier in Figure 9.).

Table 11 does show a decrease in transition time, but not in waiting time. There was a change from Phase 1 of the intervention mean percentage of 12 intervals of transition to a Phase 2 of the intervention mean of 8. However, Phase 1 of the intervention mean percentage of 8 intervals of waiting increased to a Phase 2 intervention mean of 20. An interpretation of this data is discussed later in this chapter.

Table 11. Mean Percentage Intervals Transition Time and Waiting Time -School 2

	School 2	
Behavior	Phase 1 Intervention $\overline{X}$	Phase 2 Intervention $\overline{X}$
$\overline{X}$ percentage of Transition Time intervals	12	8
$\overline{X}$ percentage of Waiting Time intervals of three target students	8	20

As did Teacher One, this teacher kept a log of concerns and objectives of the lessons during the second phase of the intervention. At the conclusion of the study, the teacher wrote her reactions to the study

and the concept of ALT-PE. This teacher expressed the following:

(1) A feeling of being rushed through directions while trying to make up for lost time, frustrated when unable to accomplish goal of keeping transition time and waiting time below 10 percent.

(2) Due to a reduced waiting time (data points 27 and 28) there was more time to give thorough directions and answer student questions who had trouble understanding the activity. A good feeling since the activity went well and goal was accomplished.

(3) Certain activities or lessons require more transition and waiting time, therefore, ALT-PE will be low.

(4) Constantly being aware that a teacher wants high ALT-PE for the students is demanding on the teacher physically as well as mentally. A feeling of frustration when transition and waiting time was high. All may contribute to more teacher burnout.

(5) A teacher wants to have a high percent of ALT-PE, but feels this sometimes prevents creativity and experimentation by the students.

(6) ALT-PE is a good thing to be aware of and to strive for, but each student needs to be dealt with by a teacher on an individual basis mentally, socially, and emotionally as well as physically.

School 3

Teacher Three taught for ten weeks a kindergarten class covering a variety of units due to the short attention span of this level (see Appendix G, Table 23 - Observation Analysis). As with all the students involved in this study, these students had physical education five days a week.

After twelve days of baseline observation, the first behavior was targeted for intervention. Table 12 shows the change from a baseline mean percentage of 24.3 intervals of waiting time on three targeted students to a Phase 1 intervention mean of 13. This reduction in waiting time can be observed on a graph in Figure 10.

Table 12. Mean Percentage of Waiting Time Intervals of Three Target Students - School 3

	School 3	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage of Waiting Time intervals of three target students	24.3	13

The second behavior targeted for change was transition time. Table 13 shows the mean percentage of transition time baseline of 17.5 reduced to a Phase 1 intervention mean of 12.

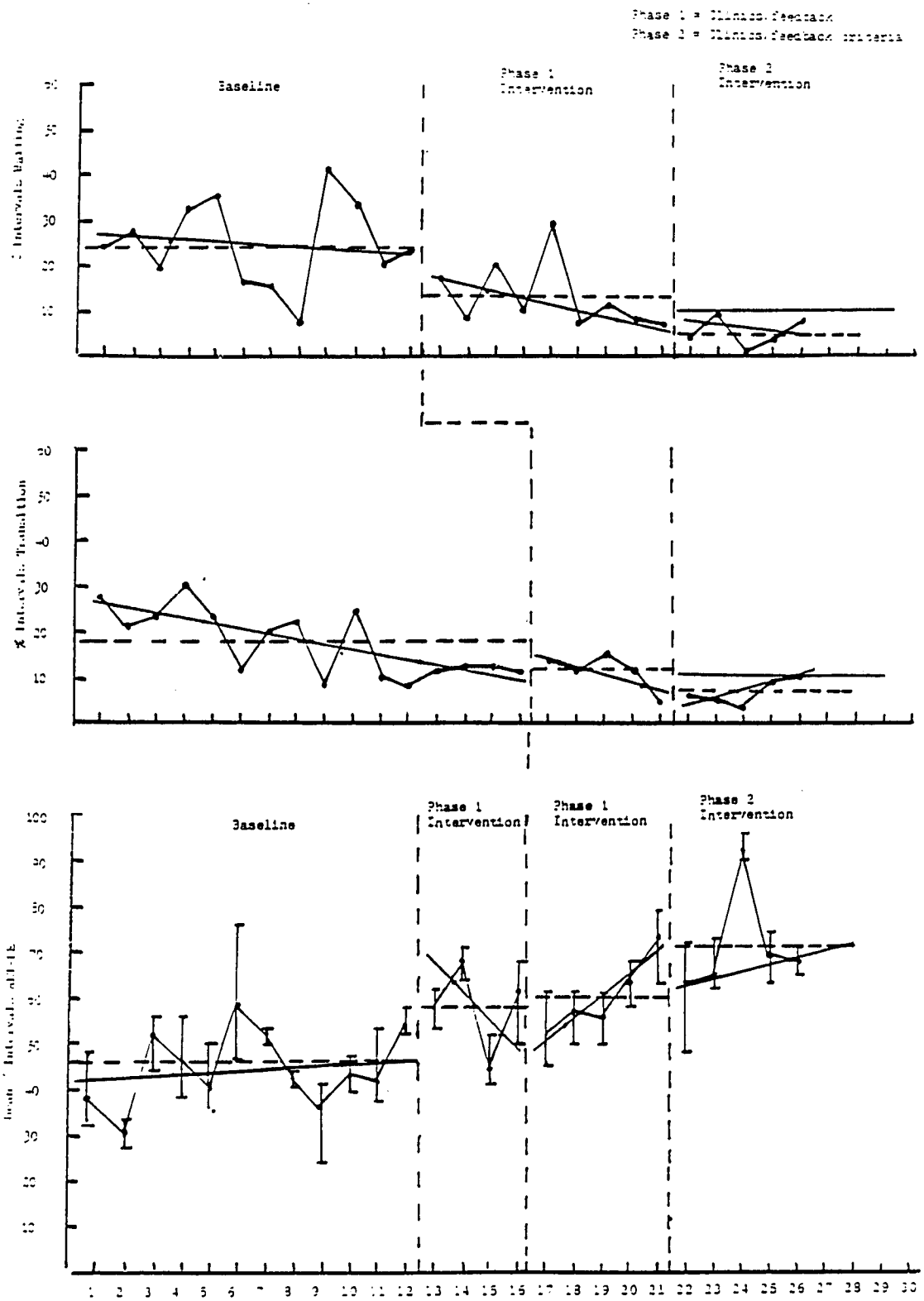


Figure 10. Graph of percentage of Intervals of Waiting, Transition, and CDT-PE for School 3.

Table 13. Mean Percentage Intervals of Transition Time - School 3

	School 3	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage intervals of Transition Time	17.5	12

As was done with Teacher One and Teacher Two, the second phase of the intervention targeted for change was keeping transition time and waiting time below a preset criterion level. Although an intervention mean waiting time of 13 percent and an intervention mean of 12 percent transition time could be considered an acceptable percent, this teacher was asked to remain below a preset criteria of 10 percent for each. The Phase 2 of the intervention on tier 1 and tier 2 on the graph in Figure 10, visually demonstrates the change between phases. Table 14 shows the change from a Phase 1 intervention mean percentage of 13 intervals of waiting to a Phase 2 intervention mean of 5.2. In addition, the Phase 1 intervention mean percentage of 12 percent intervals of transition was reduced to 7.

Table 14. Mean Percentage Intervals of Waiting Time and Transition Time - School 3

	School 3	
Behavior	Phase 1 Intervention $\overline{X}$	Phase 2 Intervention $\overline{X}$
$\overline{X}$ percentage of Waiting Time of intervals for three targeted students	13	5.2
$\overline{X}$ percentage of Transition Time intervals for three targeted students	12	7

Teacher Three reflected the following in her second phase of the intervention in her log and summary at the conclusion of the study:

(1) Hurried through directions and instructions to the students in order to get and keep students actively on task. This pressured feeling would sometimes leave a question or a concern of a particular child go unanswered by the teacher. It seemed very hard to be human and have a sincere feeling of caring for each child.

(2) The type of activity and amount of equipment made a difference in waiting and transition. The safety aspect involved in the rope climb certainly affected the waiting time.

(3) A feeling of higher ALT-PE creating less discipline problems since students have a task to complete successfully.

(4) Keeping in mind that ALT-PE is important, but not so much as teacher fails to be interested and concerned about each child.

It seemed there wasn't enough time to listen to the children because of rushing and concentrating on the students' learning time.

(5). The study was interesting and helpful in pointing out things that had fallen unnoticed before.

School 4

Teacher Four taught a fifth grade class for a period of ten weeks. The units covered were usually two weeks in length. These units included the final portion of tumbling, some square dance, gymnastics, and volleyball (see Appendix G, Table 24 - Observation Analysis).

After ten days of baseline observation, the first behavior was targeted for intervention. The first behavior targeted for change was percentage of student waiting time. Table 15 shows the change from the baseline mean percentage of 40 intervals of waiting time on three targeted students to a Phase 1 intervention mean of 45.

Table 15. Mean Percentage of Waiting Time Intervals of Three Targeted Students - School 4

	School 4	
Behavior	Baseline $\overline{X}$	Phase 1 Intervention $\overline{X}$
$\overline{X}$ percentage of Waiting Time Intervals of three target students	40	45

Figure 11 shows how the study continued at this school. As illustrated by Figure 11 no change occurred despite the continuation of the

Phase 1 = Clinics/feedback

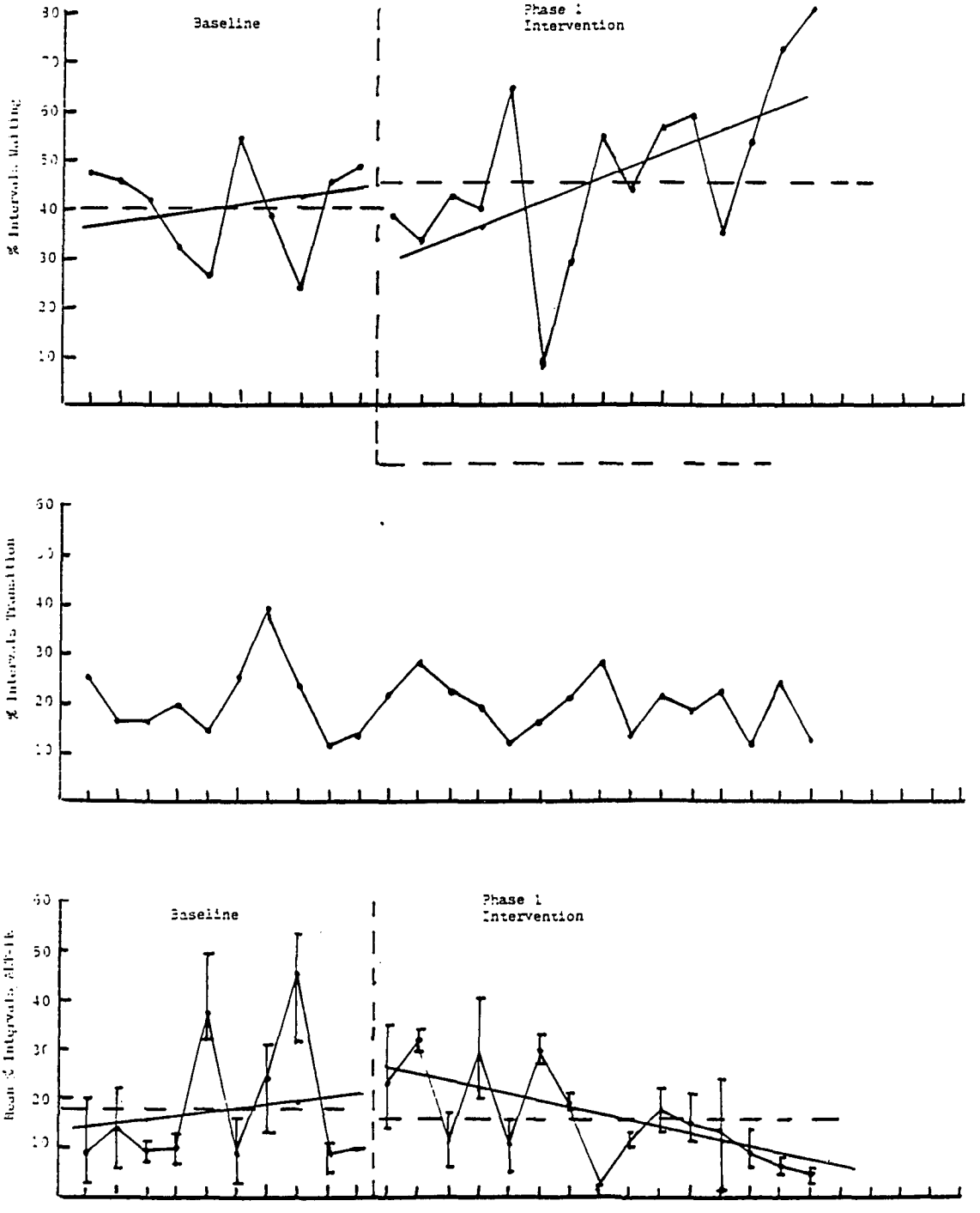


Figure 11. Graph of percentage of Intervals of Waiting, Transition, and ALT-PE for School -.

study. After 25 data points, the investigator and Teacher Four mutually agreed to discontinue the study.

Teacher Four did, however, write her summary at the conclusion of the study. Teacher Four reflected the following in her summary:

(1) Safety and liability as a major concern in gymnastics.

(2) Choosing to "play the game" in volleyball.

(3) Equipment and facilities are a factor to take into consideration when analyzing ALT-PE.

(4) A feeling that "more skill" at the elementary level is ludicrous. Students today do not have enough time to be kids. Students are pushed academically with work, told to get interested in computers, and geared to some area of athletic prowess. (Her) educational objective to develop positive use of leisure time cannot be accomplished when the class is 100 percent structured.

(5) A longer recording time per student or a different observation method would have caught more ALT-PE.

Multiple Baseline Design - One Behavior Across the Teaching Settings

While three separate replications of one design, a multiple baseline across behaviors was utilized, a second design was being conducted. A multiple baseline design of one behavior in the four teaching settings was utilized to show a relationship between the intervention and the observed changes in behavior.

Figure 12 demonstrates the relationship between the phases of the intervention (as explained in Chapter III) and the observed changes in the reduction of transition time. The fourth tier represents School 4

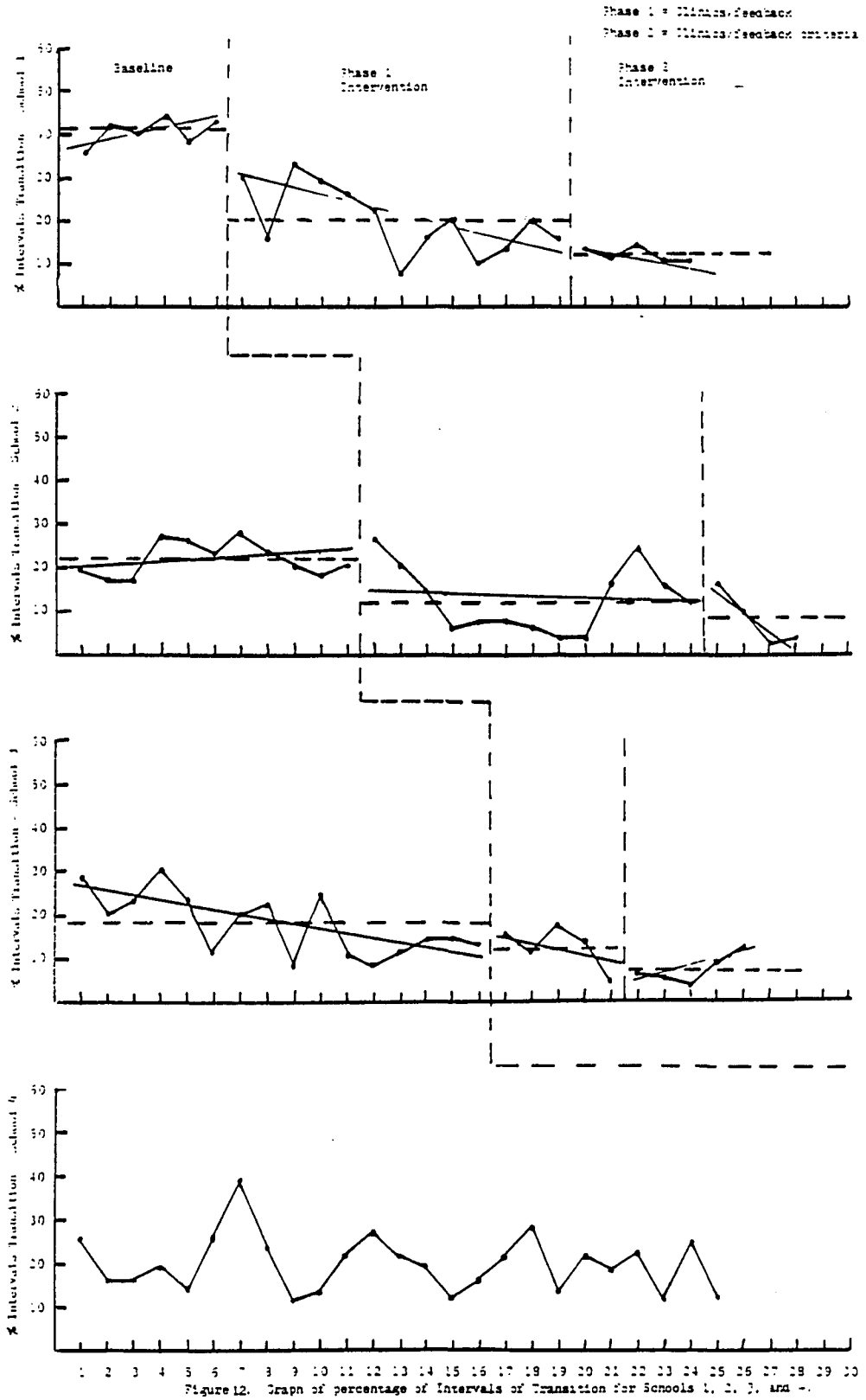


Figure 12. Graph of percentage of Intervals of Transition for Schools 1, 2, 3, and 4.

and the study was concluded prior to intervention at this school. Table 16 shows the change from the baseline mean percentage of intervals of transition for Schools 1, 2, and 3 to the Phase 2 intervention mean.

Table 16. Baseline and Intervention Mean Percentage of Intervals of Transition Time for Schools 1, 2 and 3

	Baseline	Phase 1 Intervention $\overline{X}$	Phase 2 Intervention $\overline{X}$
Teacher 1			
$\overline{X}$ percentage of intervals of Transition Time	40.5	20	11.6
Teacher 2			
$\overline{X}$ percentage of intervals of Transition Time	21.6	12	8
Teacher 3			
$\overline{X}$ percentage of intervals of Transition Time	17.5	12	7

The mean percentage of transition time for Teacher One decreased from baseline mean 40.5 to a Phase 2 intervention mean of 11.6. For Teacher Two, the mean percentage of transition time decreased from a baseline mean of 21.6 to a Phase 2 intervention mean of 8. For Teacher Three the mean percentage of transition time decreased from a baseline mean of 17.5 to a Phase 2 intervention mean of 7.

Figure 13 demonstrates the relationship between the intervention and the observed changes of waiting time for three targeted students in

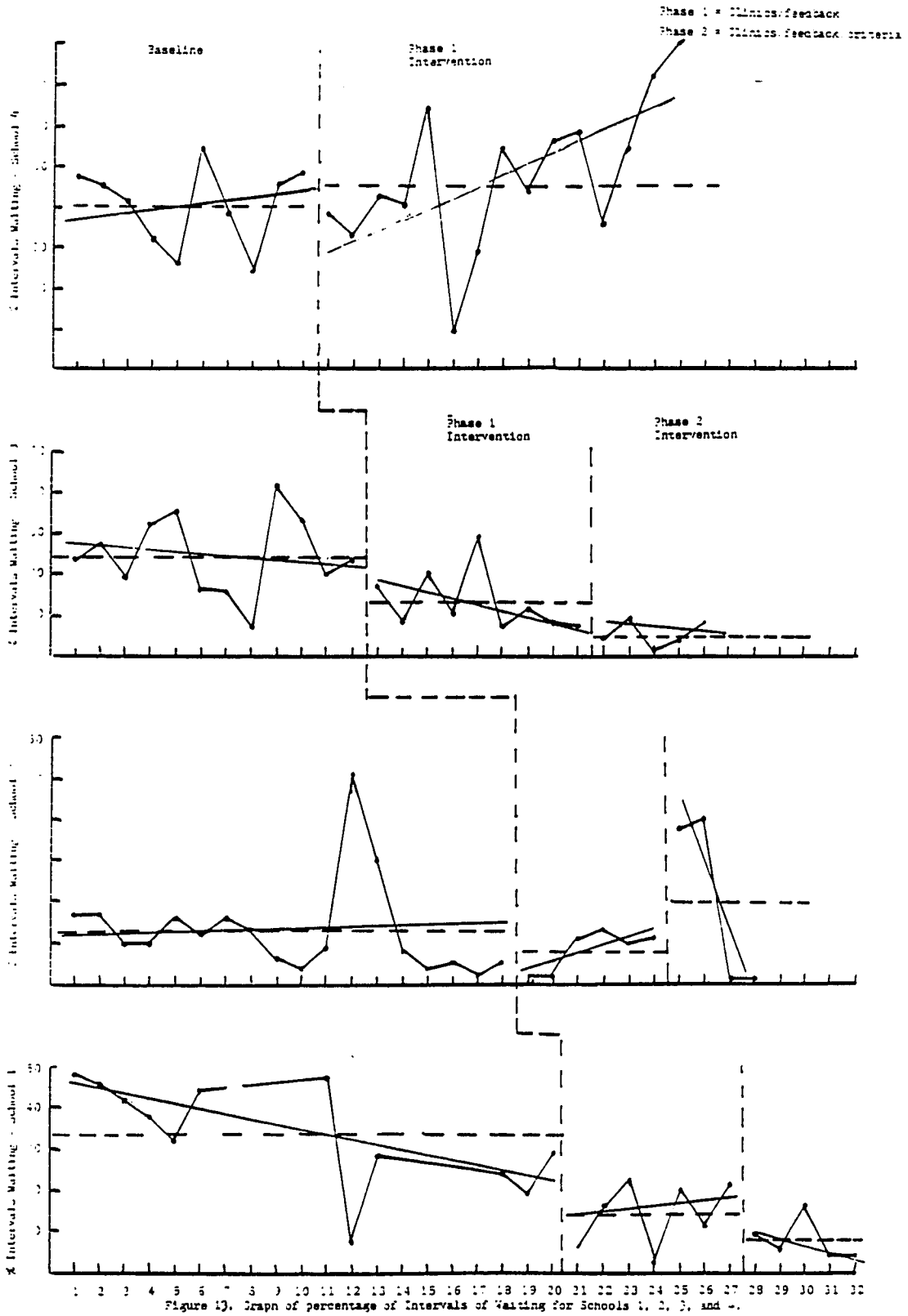


Figure 13. Graph of percentage of Intervals of Waiting for Schools 1, 2, 3, and 4.

each school. The first tier is School 4. The second tier is School 3. Intervention was implemented at this school after what seemed to be a downward trend in data at School 4. Tier three represents School 2 where intervention was implemented after a change in School 3 occurred. The last tier is School 1. There is an observation delay between data points number 6 and 11 due to the target students being sick with chicken pox. There is another delay between data points 13 and 18 due to Teacher One being sick and special school activities being conducted. However, intervention in School 1 was implemented after change took place in School 2. Table 17 shows the change from the baseline mean percentage of waiting time intervals of three targeted students at School 3, 2, and 1 to intervention means. The mean percentage of student waiting time for Teacher Three decreased from a baseline mean of 24.3 to a Phase 2 intervention mean of 5.2. For Teacher Two the mean percentage of waiting time decreased from baseline mean of 13 to a Phase 1 intervention mean of 8. However, there was an increase in student waiting time from a Phase 1 intervention mean of 8 to a Phase 2 intervention mean of 20. The mean percentage of student waiting time for Teacher One decreased from a baseline mean of 33.6 to a Phase 2 intervention mean of 7.6.

Table 17. Baseline and Intervention Mean Percentage of Waiting Time Intervals of Three Targeted Students for Schools 3, 2, and 1

	Baseline $\overline{X}$	Intervention $\overline{X}$	Intervention $\overline{X}$
Teacher 3			
$\overline{X}$ percentage of Waiting Time interval of three target students	24.3	13	5.2
Teacher 2			
$\overline{X}$ percentage of Waiting Time interval of three target students	13	8	20 *
Teacher 1			
$\overline{X}$ percentage of Waiting Time interval of three target students	33.6	14	7.6

(*) Refer to Chapter IV, Teacher Two data discussion on explanation of this data.

Concurrent Baseline Variable - ALT-PE

The variable ALT-PE was examined for changes from baseline through the various phases of the intervention by use of a concurrent baseline. This concurrent baseline was added as a third tier to the multiple baseline intervention design so that change might be more easily observed. Data for the three students on the variable ALT-PE was expressed as a mean with the range being indicated for each data point. This variable was in no way directly manipulated in this study. However, change in the dependent variable in this study is discussed as it might relate to change in the concurrent baseline variable in the

data discussion section.

Data are presented as a mean percentage for each phase of the experimental intervention. The mean and the ranges of the ALT-PE variable for the three target students in each teacher's class are graphically presented in Figures 8, 9 and 10. This variable was chosen for graphing since it seems to be a good indicator of student's opportunity to learn motor skills in physical education. Data for ALT-PE are presented in forthcoming tables.

School 1

Table 18 shows the mean of ALT-PE across the phases of this study for Teacher One.

Table 18. Mean Percentage
ALT-PE - School 1

	Baseline	Phase 1 Intervention on Transition	Phase 1 Intervention on Waiting	Phase 2 Intervention	Total Intervention
ALT-PE $\bar{X}$	16.8	34	48	56.4	46.1

Table 18 shows an increase in ALT-PE from baseline throughout each phase of the study. Visual inspection of the graph in Figure 8 shows a change in the level of ALT-PE from baseline to Phase 1 intervention on transition. This increase in ALT-PE occurred along with a decrease in transition time from a mean of 40.5 to a mean of 20.

Phase 1 of the intervention on student waiting time showed an increase in ALT-PE from 34 to 48. This increase corresponded to a decrease in student waiting time from a baseline mean of 33.6 to

intervention mean of 14 (see tier 2 on the graph in Figure 8).

At the time of the second phase of the intervention, the teacher was instructed to log her reactions, keep transition and waiting time under 13 percent, and continue using the plans implemented in the first phases of intervention. The teacher was effective in keeping transition time and student waiting time below the preset criterion level for 4 out of 5 observations in the second phase of the intervention. Subsequently, the ALT-PE mean for Phase 1 intervention was 48 increased to a mean of 56.4 in the second phase of the intervention.

The total intervention mean for ALT-PE was 46.1. It is interesting to note that this total intervention of 46.1 is higher than the ALT-PE (M) of 42.46 reported by Birdwell (1980). However, Birdwell only had the opportunity to conduct Phase 1 of the intervention on students not engaged at the elementary level.

School 2

Table 19 presents the mean percentage of ALT-PE across all phases of this study for Teacher Two.

Table 19. Mean Percentage ALT-PE - School 2.

	Baseline	Phase 1 Intervention on Transition	Phase 1 Intervention on Waiting	Phase 2 Intervention	Total Intervention
ALT-PE $\overline{X}$	46.9	45.8	67.8	55.7	56.4

The baseline mean of ALT-PE of 44.5 is already higher than the total intervention for Teacher One and higher than the ALT-PE (M) reported by

Birdwell (1980). Table 19 shows a slight decrease in ALT-PE from baseline to Phase 1 of the intervention mean on transition time.

Phase 1 of the intervention on reducing student waiting time corresponded with an increase in ALT-PE from 45.8 to 67.8 percent. It is interesting to note the high percentage of ALT-PE for data points 17 through 20 which involved a Florida Coastal Jog. Transition and waiting time were extremely low (see Figure 9) and ALT-PE correspondingly high. The next unit involving throwing and catching skills with scoops required teaching stations with equipment which slightly increased transition time and student waiting time. ALT-PE subsequently lowered but was still an improvement from baseline.

With the second phase of the intervention came an even further reduction in transition time but not student waiting time (see data discussion for Teacher 2). A total intervention mean of 56.4 was reported for ALT-PE in Teacher Two's classroom.

School 3

Table 20 shows the mean of ALT-PE across phases of this study for Teacher Three.

Table 20. Mean Percentage
ALT-PE - School 3

	Baseline	Phase 1 Intervention on Waiting	Phase 1 Intervention on Transition	Phase 2 Intervention	Total Intervention
ALT-PE $\overline{X}$	44.5	58	60.2	71.4	63.2

The baseline mean of ALT-PE of 44.5 is already higher than earlier reports (Birdwell, 1980). Table 20 shows an increase in ALT-PE from

baseline of 44.5 to a Phase 2 intervention mean of 71.4 Visual inspection of the graph in Figure 10 shows the change in ALT-PE. As student waiting time decreased (see tier 1, Figure 10), there was a subsequent increase in ALT-PE.

Phase 1 intervention on transition time showed a slight increase in ALT-PE from 58 to 60.2. This increase corresponded to a slight decrease in transition time from a baseline mean of 17.5 to an intervention mean of 12.

The second phase of the intervention, keeping student waiting time and transition time below a preset criterion level of 10 percent, showed an even further increase in ALT-PE from 60.2 to 71.4. Student waiting time decreased even further from 13 to 5.2 and transition time from 12 to 7 during this second intervention. A total intervention mean of 63.2 for ALT-PE was reported for Teacher Three's classroom.

Data Discussion

School 1

Teacher One taught for 10 weeks in a lower middle SES elementary school to a large class of first graders. The units were one or two days in length and varied throughout the study. This grade level has a short attention span and requires a variety in the lesson as well as between lessons.

After six days of baseline observation, the first behavior was targeted for intervention. Table 6 demonstrated the change from a baseline mean percentage of 40.5 intervals of transition to a Phase 1 intervention mean of 20. This is a significant reduction in transition time as can be observed on the graph in Figure 8. Baseline data indicated

that this teacher accumulated much of her transition time moving from one teaching station to another, having the teaching stations too complicated, and handing out equipment. Instructions about moving stations closer together, simplifying the activities so that less set-up time is required, and having equipment previously set up for the students were successful in decreasing the transition time in this class. Feedback and further discussion between the teacher and the investigator after each observation session was also successful in decreasing the transition time.

During the Phase 1 intervention, an Assertive Discipline Program was implemented by the teacher from a school workshop. The following outlines the steps and rewards of the system.

Assertive Discipline Program

(1) Warning to child by writing child's name down.

(2) Check by student's name - student goes to his/her own dot (time-out).

(3) Two checks by student's name - a note sent home to parents explaining situation.

(4) Three checks by student's name - teacher calls parents.

(5) Four checks by student's name - student sent to principal's office.

Rewards

(1) Positive notes home to different children on a daily basis for appropriate behavior.

(2) Fun day on Fridays (choice of activities or lessons covered week) for those students who had no checks by their names.

(3) Praise and feedback to students who were on task during the lesson.

This was effective for the students and the teacher since it was systematic and concise. The entire system was carried out daily and throughout the length of the study.

The second behavior targeted for change was student waiting time. The same intervention strategy was used whereby the teacher was provided with instructions as to how student waiting time might be reduced and then was given feedback about the waiting time after each observation. It was suggested that the teacher (1) decrease the number of students at each station, (2) gear activities so that there was sufficient equipment for the students, and (3) give out good behavior notes to students while they were on their way back to class instead of sitting everyone down at the end of the lesson. Table 7 shows the mean percentage of waiting time for all three target students during baseline and Phase 1 intervention.

Visual inspection of the second tier of the graph in Figure 8 shows a decrease in the waiting time by the three targeted students. Daily feedback aided in the successful decrease of waiting time. It is interesting to note the reduction in baseline of student waiting time once the intervention was introduced in transition (see Figure 8, data point 7 first and second tier). The intervention on transition may have caused the downward trend in student waiting time.

The second phase of the intervention of keeping transition time and waiting time below a preset criterion level was targeted. As stated earlier, this was a larger than usual class (34 students), and an

interpretation of the data justified a maximum of 13 percentage intervals for each transition time and waiting time. This preset standard was for the teacher to consciously try to study under. It was suggested that the teacher (1) explain skills with three or less teaching points for the students to remember, (2) keep directions short and concise, (3) plan in advance ways to quickly and easily hand out equipment as well as changing activities, and (4) strictly adhere to the Assertive Discipline Program. Table 8 displayed the mean decrease in percentage intervals from the Phase 1 intervention means to the Phase 2 intervention means. Transition time was reduced from a Phase 1 intervention mean of 20 to a Phase 2 intervention mean of 11.6. Waiting time decreased from a Phase 1 intervention mean of 14 to a Phase 2 intervention mean of 7.6. Teacher 1 stayed under the preset criteria of 13 percent for both transition and waiting time four out of the last five data points (see Figure 8, tier 1 and 2, Phase 2 intervention).

There was an upward trend in waiting time during Phase 1 intervention but Phase 2 reduced student waiting time (see Figure 8) considerably below the preset criteria for four out of the last five data points. The intervention of clinics, daily feedback and preset criteria aided greatly in the reduction of transition and waiting time at this school.

School 2

Teacher Two taught for ten weeks a class of third graders, covering units which were on the average of three days in length. Some units or lessons were only one or two days long.

After eleven days of baseline observation, intervention began (see tier 1 on the graph in Figure 9). Like Teacher One, this teacher accumulated transition time. Although a mean percentage of transition time of 21.6 (see Table 9) is not that high, it was felt that this figure could be reduced. Instructions and implementation of various teaching strategies such as moving quickly to teaching stations and having equipment set up at each station were successful in decreasing the transition time. Daily feedback and discussion after each observation session were even more effective for this teacher as she graphed her percentages (as described in Chapter III). Transition time was reduced from a baseline mean of 21.6 to a Phase 1 mean of 12.

The second behavior targeted for intervention was student waiting time. A mean percentage of waiting time intervals of 13 percent (see Table 10), as stated earlier, would normally be considered an acceptable level, however, it was still targeted for change. Instructions, feedback and graphing were successful in changing the baseline percentage of 13 to an intervention percentage of 8. The second tier of the graph in Figure 9 demonstrates the already low amount of waiting time and still a decrease in student waiting time occurred. Observe, as with Teacher One, that once intervention on transition was introduced, there was a reduction in student waiting time during baseline (see Figure 9 data point 12, first and second tier). Again, the intervention on transition may have caused this reduction in student waiting time.

The second phase of the intervention targeted for change was keeping transition time and waiting time below a preset criterion level of 10 percent. This was chosen because on the twenty-first data point and

the data points following, there was an increase in transition and waiting time (see the first and second tier in Figure 9). This increase may have been influenced by the change in units. The previous unit of a Florida Coastal Jog enabled students to immediately begin the activity without equipment. The next unit involved throwing and catching skills with scoops using stations and equipment which may have been associated with increased transition and waiting time.

Table 11 did show a decrease in transition time, but not in waiting time. However, it is felt that the intervention was effective and that the waiting time may have been due to the activity and the amount of equipment utilized. On the twenty-fifth and twenty-sixth data points, students participated in a bowling unit where four students were at a station with three pins (see Figure 9). On the twenty-seventh and twenty-eighth data points, waiting time decreased dramatically, seemingly due to the daily feedback and discussion between this teacher and the investigator. It was decided that a modified game involving bowling would still meet the teacher's objectives and provide more opportunities for students to practice the specific skills of the unit.

Due to time constraints by the observer, the teacher and the investigator, the study concluded at this point. It is felt that more observations at this point may have demonstrated a continuing trend of reduced transition time and waiting time. Teacher Two did manage, however to stay below the preset criteria 10 percent for three out of the four data points in Phase 2 of transition. Once the modified bowling game was introduced, Teacher Two had student waiting time down to one percent for data points twenty-seven and twenty-eight.

School 3

Teacher Three taught for ten weeks a kindergarten class covering a variety of units due to the short attention span of this level. After twelve days of baseline observation, the first behavior was targeted for intervention. Table 12 demonstrated the change from a baseline mean of 24.3 intervals of waiting time on three targeted students to a Phase 1 intervention mean of 13. This is a significant reduction in waiting time as can be observed on the graph in Figure 10. Baseline data indicated this behavior as a main deterent in the classroom. As was cited in Chapter III, this teacher has 13 years experience at this school. Therefore, once the initial mini-clinic was conducted, the graphing of the daily feedback and discussion with the investigator were successful in decreasing the waiting time. The investigator also taught at this school, which provided more opportunities to suggest and/or share with this teacher ways to implement change. This teacher on her own initiative thought of innovative changes which aided in the decreased waiting time.

The second behavior targeted for change was transition time. Again the same intervention strategy was used whereby the teacher was provided with instructions as to ways that transition time might be reduced and then was given feedback about transition time after each observation. Since this grade level needed a variety of activities, changing activities more often contributed to transition time. Using a variety of motor tasks such as balancing a bean bag while moving to the next activity, was successful in decreasing transition time. Table 13 demonstrated

the mean percentage of transition time baseline of 17.5, already a low amount,to intervention of 12.

Again, it is interesting to note an induction effect on the second behavior targeted for change. As with School 1 and 2, the initial intervention brought about a reduction during baseline of the second targeted behavior (see Figure 10 data point 13 in tier one and tier two).

The second phase of the intervention targeted for change was keeping waiting time and transition time below a preset criterion level of 10 percent. Although a Phase 1 intervention mean of 13 percent intervals waiting time and 12 percent intervals of transition time could be considered acceptable, the teacher was challenged by trying to lower the percentage even further. Continued feedback after each observation and recording the percentages on a graph were effective in decreasing these behaviors further. As Table 14 showed, student waiting time decreased from a Phase 1 intervention mean of 13 to a Phase 2 intervention mean of 5.2. Transition time decreased from a Phase 1 intervention mean of 12 to a Phase 2 intervention mean of 7. Figure 10 demonstrates the visual change between phases.

The clinics, daily feedback and preset criteria were effective in reducing student waiting time and transition time.

School 4

Teacher Four taught a fifth grade class for a period of ten weeks. The units covered were usually two weeks in length. These units included the final portion of tumbling, square dance, gymnastics, and volleyball.

After ten days of baseline observation, the first behavior, student waiting time, was targeted for intervention. Baseline data indicated that this teacher accumulated much of her student waiting time by having few teaching stations with many students waiting for a turn at each station. Suggestions for change were given so as to increase the number of skill positions and/or fitness stations available within the gymnastics unit. Students were placed in groups of four and rotated among an increased number of stations. After implementing this plan for several days, the teacher discontinued this because she felt this plan was just a method to "keep students busy" rather than one which would aid in developing any specific fitness level or skill.

Table 15 demonstrated the change from the baseline mean percentage of 40 intervals of waiting time on three targeted students to an intervention mean of 45. This reflected a contradiction in the previous schools used in the study. After the initial mini-clinic was conducted, feedback after each observation session was continued, and the teacher was asked to continue graphing her data. The teacher discontinued the suggested stations saying that she felt that students were expected to have the initiative to stay on task and that it doesn't work. She expressed a concern of the stations placing students in a situation which could be injurious to them and liable to her.

On the sixteenth data point, the students waiting time was 9 percent (see Appendix G, Table 24 - Observation Analysis School 4, tier 1 on the graph in Figure 11). Students were involved in a low organized game with one of the school's paraprofessionals while the teacher conducted her skill tests on other students. This reflects another belief

expressed by this teacher in that she wanted to be accountable through these skill tests (see data points 2, 3 and 25 in the Appendix G, Table 24, - Observational Analysis, School 4).

A two week volleyball unit began on the eighteenth data point. The feedback and discussion between the teacher and the investigator after this observation suggested ways to implement a teacher setting which could facilitate reduced student waiting time. The teacher wanted the students to "play the official game" and have few rules or regulations. She didn't want to implement the suggestions. The teacher wanted to play more of the game in volleyball by keeping small teams, using ropes as nets and having a tournament.

At this point in the study, the investigator decided to finish coding the volleyball unit and to have a meeting with the teacher at her school. The teacher and the investigator spoke about beliefs and philosophies. With a difference in educational philosophies expressed by each, both the teacher and the investigator felt it was best to conclude the study at this time. The teacher did write her summary at the conclusion of the study (see data presentation - School 4).

Multiple Baseline Design - One Behavior Across the Teaching Settings

While three separate replications of one design, a multiple baseline across behaviors was utilized, a second design was being conducted. A multiple baseline design of one behavior in the four teaching settings was utilized to show a relationship between the intervention and the observed change in behavior.

Figure 12 demonstrates the relationship between the phases of the intervention (as explained in Chapter III) and the observed changes in

the reduction of transition time. The fourth tier represents School 4 and the study was concluded prior to intervention at this school. Table 16 demonstrated the change from the baseline mean percentage of intervals of transition for each school to the Phase 1 and Phase 2 intervention mean.

The mean percentage of transition time for Teacher One decreased from baseline mean 40.5 to a Phase 2 intervention mean of 11.6. For Teacher Two, the mean percentage of transition time decreased from a baseline mean of 21.6 to a Phase 2 intervention mean of 8. For Teacher Three, the mean percentage of transition time decreased from a baseline mean of 17.5 to a Phase 2 intervention mean of 7. This demonstrates that short instructional clinics, daily systematic feedback and graphing the data were effective in reducing the transition time in each school.

Figure 13 demonstrates the relationship between the intervention and the observed changes of waiting time for three targeted students in each school. The first tier is School 4 in which a difference of educational philosophies is believed to have prevented an effect from baseline through intervention. The second tier is School 3. Intervention was implemented at this school after what seemed to be a downward trend in data at School 4. Tier three represents School 2 where intervention was implemented after a change in School 3 occurred. The last tier is School 1. There is an observation delay between data points number 6 and 11 due to the target students being sick with chicken pox. There is another delay between points 13 and 18 due to Teacher One being sick and special school activities being conducted. However, intervention in

School 1 was implemented after change took place in School 2. Table 17 explained the change from the baseline mean percentage of waiting time intervals of three targeted students at School 3, 2, and 1 to intervention means. The mean percentage of student waiting time for Teacher Three decreased from a baseline mean of 24.3 to a Phase 2 intervention mean of 5.2. For Teacher Two the mean percentage of waiting time decreased from an already low baseline mean of 13 to a Phase 1 intervention mean of 8. However, there was an increase in student waiting time from a Phase 1 intervention mean of 8 to a Phase 2 intervention mean of 20. This may be due to the nature of the activity (see Teacher Two, data discussion). Once a modification was implemented by the teacher, student waiting time did decrease. The mean percentage of student waiting time for Teacher One decreased from a baseline mean of 33.6 to a Phase 2 intervention mean of 7.6. Overall, a good case could be made that short instructional clinics, daily systematic feedback and graphing of the data were effective in reducing student waiting time.

Concurrent Baseline Variable - ALT-PE

The variable ALT-PE was examined for changes from baseline through the various phases of the intervention by use of a concurrent baseline. This concurrent baseline was added as a third tier to the multiple baseline intervention design so that change might be more easily observed. As stated earlier, data for the three students on the variable ALT-PE were expressed as a mean with the range being indicated for each data point. Since this variable was in no way directly manipulated in this study, no statements of causality can be made. However, change in the

dependent variable in this study is discussed as it might relate to change in the concurrent baseline variable.

Data are presented as a mean percentage for each of the experimental interventions. The mean and the ranges of the ALT-PE variable for the three target students in each teacher's class are graphically presented in Figures 8, 9, 10 and 11. This variable was chosen for graphing since it seems to be a good indicator of student's opportunity to learn motor skills in physical education. Data for ALT-PE were presented in Tables 18, 19 and 20 earlier in this chapter. The discussion is presented in the context of each individual teacher's classroom.

School 1

Table 18 demonstrated the mean of ALT-PE across the phases of this study for Teacher One. There was an increase in ALT-PE throughout each phase of the study. Visual inspection of the graph in Figure 8 shows a change in the level of ALT-PE from a baseline mean of 16.8 to a Phase 1 intervention mean on transition of 34. This increase in ALT-PE occurred along with a significant decrease in transition time from a baseline mean of 40.5 to a Phase 1 mean of 20.

Phase 1 of the intervention on student waiting time showed an increase in ALT-PE from a Phase 1 intervention on transition mean of 34 to a Phase 1 intervention on waiting time mean of 48. This increase corresponded to a decrease in student waiting time from a baseline mean of 33.6 to a Phase 1 intervention mean of 14 (see tier 2 on the graph in Figure 8).

At the time of the second intervention, the teacher was instructed to continue using the plans implemented in the first phase of the intervention, to log her reactions and keep transition and waiting time under 13 percent each. The teacher was effective in keeping transition time and student waiting time below the preset criterion level for 4 out of 5 observations in the second intervention. Subsequently, the ALT-PE mean for the Phase 1 intervention of 48 increased to a Phase 2 mean of 56.4 in the second phase of the intervention.

In Figure 8, Phase 2 of the intervention, ALT-PE shows a downward trend. On the twenty-second data point transition time was 14 percent student waiting time was 16 percent and cognitive was 13 percent, with ALT-PE being 53 percent. This could support the need to decrease these variables in order for ALT-PE to increase.

On the twenty-third and twenty-fourth data points, transition and waiting time were low with ALT-PE being only 50 percent and 46 percent respectively. Table 21 in Appendix G shows that students were motor engaged but in a motor supporting role. The students were motor engaged 71 and 60 percent of the class time on these observations.

The total intervention mean for ALT-PE was 46.1 It is interesting to note that this total intervention of 46.1 is higher than the ALT-PE (M) of 42.46 reported by Birdwell (1980). However, Birdwell only had the opportunity to conduct Phase 1 of the intervention on students not engaged at the elementary level. This could still support the effect of the intervention on reducing transition or waiting time and subsequently having an increase in ALT-PE.

School 2

Table 19 presented the mean percentage of ALT-PE across all phases of the study for Teacher Two. The baseline mean of ALT-PE of 46.9 is already higher than the total intervention for Teacher One and higher than the ALT-PE(M) reported by Birdwell (1980). Table 19 showed a slight decrease in ALT-PE from a baseline mean of 46.9 to a Phase 1 intervention on transition mean of 45.8. Several factors may have contributed to this slight decrease. First, observation session 12 and 13 involved a tumbling unit (see Table 22 - Appendix G). The first phase of the intervention on transition time was successful in decreasing the transition percentage from a baseline mean of 21.6 to a Phase 1 intervention mean of 12. However, large amount of student waiting time during the tumbling unit most likely had a role in holding down ALT-PE (see Figure 9, tier 2, points 12 and 13).

Secondly, observation sessions 14, 15 and 16 involved a Chinese Jump Rope unit. On the fourteenth data point, Figure 9 demonstrates the lower percentage of transition time of 14 percent and a high percent of ALT-PE of 67 percent. On the fifteenth and sixteenth data point transition was only 6 and 7 percent (see Table 22 - Appendix G) while APT-PE was 17 and 22 percent. However, students were motor supporting 59 and 60 percent of the class time. These lessons became more challenging as they progressed requiring students to be in a motor supporting role while other students became successful at a more difficult task.

The Phase 1 intervention on reducing student waiting time corresponded with an increase in ALT-PE from 45.8 to 67.8 percent. It is interesting, as noted earlier, the high percentage of ALT-PE for data

points 17 through 20 which involved a Florida Coastal Jog. Transition and waiting time were extremely low (see Figure 9) and ALT-PE correspondingly high. The next unit involving throwing and catching skills with scoops required teaching stations with equipment which slightly increased transition time and student waiting time. ALT-PE subsequently lowered but was still an improvement from baseline.

With the second phase of the intervention came an even further reduction in transition time but not student waiting time. As was discussed earlier (see School 2 data discussion), a bowling unit may have contributed to the higher waiting time. Once a modified game involving the same skills was introduced, transition time and waiting time were low while ALT-PE subsequently increased.

A total intervention mean of 56.4 was reported for ALT-PE in Teacher Two's classroom. This was higher than Teacher One with a total intervention mean for ALT-PE of 46.1.

School 3

Table 20 presented the mean of ALT-PE across phases of this study for Teacher Three. The baseline mean of ALT-PE of 44.5 is already an acceptable level and higher than earlier reports (Birdwell, 1980). Table 20 shows an increase in ALT-PE from baseline of 44.5 to a Phase 1 intervention on waiting time mean of 58. Visual inspection of the graph in Figure 10 shows the change in ALT-PE. As student waiting time decreased (see tier 1, Figure 10), there was a subsequent increase in ALT-PE. The downward trend of ALT-PE could be a result of the safety factor involved in the lesson on data point 15. This kindergarten class participated in

a rope climb. Due to safety for the students and teacher liability, only three ropes were used at one time (see Table 23 - Appendix G). As a result, student waiting time was 20 percent of the lesson. Data point 17 is another example of student safety where students participated in an obstacle course and the teacher needed to spot students to prevent injury. The waiting time was 29 percent of the lesson.

Phase 1 intervention on transition time showed a slight increase in ALT-PE from 58 to 60.2. This increase corresponded to a slight decrease in transition time from a baseline mean of 17.5 to a Phase 1 intervention mean of 12.

The second intervention, keeping student waiting time and transition time below a preset criterion level, showed an even further increase in ALT-PE from 60.2 to 71.4. Student waiting time decreased even further from 13 to 5.2 and transition time from 12 to 7 during this second intervention. A total intervention mean of 63.2 for ALT-PE was reported for Teacher Three's classroom.

This research study attempted to answer two specific questions. First, can selected behaviors of inservice teachers be changed significantly through intervention? A good case can be made that three of the four teachers' behaviors changed throughout the intervention. However, the magnitude of these changes may not be maintained once the study has been completed. The teachers expressed value in the importance of ALT-PE but not as the sole purpose of their profession.

Secondly, will these changes in teacher behavior be associated with increases in student academic learning time in physical education? In each school, where the teachers' behaviors changed, there was an increase in ALT-PE for the students. Since there wasn't a direct inter-

vention on the variable ALT-PE, one can't state that the ALT-PE changes were the result of the change in teacher behavior. However, the changes in ALT-PE for the students did occur simultaneously with changes in teacher behavior.

This study has shown that teacher behavior changes can possibly influence changes in student ALT-PE. However, whether or not changes in ALT-PE are a socially valued priority for these teachers is still in question. One cannot state that this intervention and these changes have social significance for these teachers in their elementary setting.

Summary

This chapter reported the results of the intervention on teaching and student behaviors of the four schools who were in this study. Results of inter-observer agreement scores were presented and discussed.

The data were presented through tables and graphs. Mean percentages of occurrence were presented for baseline and intervention on the dependent variables of interest, transition time and student waiting time. Mean percentage of occurrence for the combined data from the three target students in each class were reported for the concurrent baseline variable ALT-PE. Statements involving teacher concerns, priorities of the lesson and reactions to the study were presented. A discussion of the data for each separate classroom followed the data presentation.

Chapter V will summarize the study, present statements drawn from the results and suggest future research directions involving Academic Learning Time in Physical Education.

CHAPTER V

SUMMATION OF THE STUDY

This chapter presents statements based upon the results of ALT PE intervention studies conducted with in-service physical education teachers at the elementary level in Pinellas County. The chapter concludes with recommendations for further study of ALT-PE.

A Review of the Study

The purposes of this study were:

1. To train physical education teachers in selected schools of the Pinellas County school system as observers to collect data with the revised 1982 ALT-PE instrument;
2. To measure the levels of ALT-PE at the elementary level in Pinellas County; and
3. To intervene on teacher behavior and classroom conditions in several physical education contexts in order to analyze the relationship of teacher practices to the academic learning time of students.

Academic Learning Time can be viewed as an intervening link between teacher behavior or practices and student achievement. Within the Beginning Teacher Evaluation Study (BTES), ALT was conceptualized as a measure of teacher effectiveness so that teachers would try to influence student academic learning time in hopes of increasing student achievement.

Physical education, as stated earlier, is a subject matter that has difficulty in accurately assessing student achievement. Therefore, academic learning time becomes a viable method of determining student performance as well as teacher effectiveness.

The review of the BTES literature showed that there might be several ways to increase ALT through direct intervention or through changing various teaching behaviors. It was after the first descriptive study of Academic Learning Time in Physical Education (Metzler, (1979) that Birdwell (1980) conducted one of the initial experimental studies utilizing ALT-PE as a criterion variable against which changes in certain teaching behaviors, thought to be closely linked to levels of ALT-PE, was evaluated. Birdwell (1980) conducted an intervention on various teaching behaviors based on suggestions from the BTES literature.

This study was intended to be a systematic replication of Birdwell's (1980) study at the elementary level. One study must build upon another in order to better understand a technique and to develop a science of teaching. How well a study replicates aides in the generalization. If one is to gain confidence in the reliability of a functional relationship and in the generality of that relationship, then there must be the repeated demonstration of a particular environment-behavior relationship across different subjects in different settings at different times (Siedentop, 1982).

The first phase of this study involved the training of physical education teachers in selected schools in Pinellas County as observers to collect data with the revised 1982 ALT-PE instrument. All of the teachers had no prior experience in observational recording. Observers

were trained in a sequential task program to learn the revised 1982 Academic Learning Time-Physical Education System.

Inter-observer Agreement was checked three times in each setting, once per baseline, once in Phase 1 intervention on transition time and once in Phase 1 intervention on waiting time. Due to the investigator teaching school an inter-observer agreement check during Phase 2 of the intervention could not be done. A total of eleven inter-observer agreement checks were made which included 32 individual checks on target students. Ninety-seven percent of all individual categories scored-interval agreement percentages met or exceeded criterion levels established prior to data collection.

The second phase of the study involved the collection of data in four physical education settings at the elementary level. Four teachers, one at each school, served as subjects for the study. Three target students in each teacher's classroom were selected at random from a group of students having high attendance, for observation. The intervention consisted of short instructional clinics, daily systematic feedback and preset criterion levels for teachers to meet. A total of 24 observations were made on Teacher One, a total of 28 observations were made on Teacher Two, a total of 26 observations were made on Teacher Three and a total of 25 observations were made on Teacher Four.

A multiple baseline across behaviors was utilized to show a relationship between the intervention and the behaviors at each school. The variable ALT-PE was examined via a concurrent baseline but was never subject to intervention. A multiple baseline of one behavior across teaching settings was also utilized to show a relationship between the

intervention and the dependent variables.

The data were subjected to descriptive statistical analysis for each phase of the study. Mean percentage of occurrence changes between baseline, each phase of the intervention and the total intervention were reported for both dependent variables as well as the concurrent variable, ALT-PE, through tables and visual inspection of the graphs. The qualitative data of teachers' logged concerns, priorities of the lesson and reactions to the study were included with the data presentation.

Once the data were presented, the data were discussed for each school using tables, graphs and observational analyses in Appendix G.

Conclusions

The conclusions of this study are divided into five categories: Conclusions for Teacher One, Teacher Two, Teacher Three, the behaviors across the teaching setting, and the qualitative data collected from the teachers.

The first set of conclusions refer to the analysis of the data in the study from Teacher One.

1. Intervention consisting of mini-clinics and daily systematic feedback was successful in decreasing transition time from a baseline mean of 40.5 to a Phase 2 intervention mean of 11.6.
2. Intervention was successful in reducing student waiting time from a baseline mean of 33.6 to a Phase 2 intervention mean of 7.6.
3. Though no statements of causality can be made, ALT-PE increased from a baseline mean of 16.8 to a total intervention mean of 46.1.

4. The increase of ALT-PE from a baseline mean of 16.8 to a Phase 1 intervention on transition mean of 34 occurred along with the decrease in transition time from 40.5 to 20. A case could be made that a reduction in transition time might influence an increase in ALT-PE.

5. The increase in ALT-PE from a Phase 1 intervention on transition mean of 34 to a Phase 1 intervention on waiting mean of 48 occurred along with the decrease in student waiting time from 33.6 to 14. A case could be made that a reduction in student waiting time might influence an increase in ALT-PE.

6. The increase in ALT-PE from a Phase 1 intervention of 48 to a Phase 2 intervention of 56.4 occurred along with the further reduction in transition time of 20 to 11.6 and the further reduction in student waiting time from 14 to 7.6. This continues to support the case that a reduction in transition time and waiting time might influence an increase in ALT-PE.

The second set of conclusions refer to the analysis of the data from the study of Teacher Two.

7. Intervention consisting of mini-clinics and daily systematic feedback was successful in decreasing transition time from a baseline mean of 21.6 to an intervention mean of 8.

8. Intervention was successful in reducing an already low percentage of student waiting time of a baseline mean of 13 to a Phase 1 intervention on waiting time mean of 8. However, student waiting time increased from a Phase 1 intervention mean of 8 to a Phase 2 intervention mean of 20. This may have been

due to a bowling unit where four students were at a station with three pins. With the daily systematic feedback, a modified game which met the teacher's objectives was implemented and the waiting time did decrease.

9. Though no statements of causality can be made, ALT-PE increased from a baseline mean of 46.9 to a total intervention mean of 56.4. Such a small change may be accounted for in the units involved in Phase 1 intervention and the high percentage of waiting time in Phase 1 intervention.

10. The decrease of ALT-PE from a baseline mean of 46.9 to a Phase 1 intervention on transition mean of 45.8 occurred even though there was a decrease in transition time from 21.6 to 12. Two factors may have contributed to this decrease in ALT-PE. First, a tumbling unit was implemented during Phase 1 with a high percent of student waiting time. Secondly, a Chinese Jump Rope unit was implemented during Phase 1 intervention which required students to be motor supporting a large percentage of class time.

11. The increase in ALT-PE from a Phase 1 intervention on transition mean of 45.8 to a Phase 1 intervention on waiting time mean of 67.8 occurred along with a decrease in student waiting time from an already low percent of 13 to 8. Transition time remained low during Phase 1 intervention on waiting, therefore, a case could be made that a reduction in transition time and student waiting time might influence an increase in ALT-PE.

12. The decrease in ALT-PE from a Phase 1 intervention on waiting time to 67.8 to Phase 2 intervention of 55.7 occurred along with a decrease of transition time of 12 to 8, and an increase in student waiting time from 8 to 20. This continues to demonstrate a need for transition time and waiting time to be reduced in order for ALT-PE to have an opportunity to increase.

The third set of conclusions refer to the analysis of the data from the study of Teacher Three.

13. Intervention was successful on decreasing student waiting time from a baseline mean of 24.3 to an intervention mean of 5.2.

14. The baseline mean percentage of occurrence of transition time was relatively low at 17.5, yet intervention was successful in reducing this to 7.

15. Though no statements of causality can be made, ALT-PE increased from a baseline mean of 44.5 to a total intervention mean of 63.2.

16. The increase of ALT-PE from a baseline mean of 44.5 to a Phase 1 intervention on waiting time mean of 58 occurred along with the decrease in student waiting time from 24.3 to 13. A case could be made that a reduction in student waiting time might influence an increase in ALT-PE.

17. The increase in ALT-PE from a Phase 1 intervention on waiting time mean of 58 to a Phase 1 intervention on transition mean of 60.2 occurred along with the decrease in transition time from 17.5 to 12. A case could be made that a reduction in transition time might influence an increase in ALT-PE.

18. The increase in ALT-PE from a Phase 1 intervention on transition mean of 60.2 to a Phase 2 intervention mean of 71.4 occurred along with the further reduction in student waiting time from 13 to 5.2 and the reduction of transition time from 12 to 7. This continues to support the case that a reduction in student waiting time and transition time might influence an increase in ALT-PE.

The fourth set of conclusions refer to the analysis of the data from the behaviors across the teaching settings.

19. The mean percentage of transition time decreased from a baseline mean of 40.5 to an intervention mean of 11.6 for Teacher One, from a baseline mean of 21.6 to an intervention mean of 8 for Teacher Two, and from a baseline mean of 17.5 to an intervention mean of 7 for Teacher Three. This demonstrates that short instructional clinics, daily systematic feedback and pre-setting criteria were effective in reducing transition time in these schools.

20. Overall, a case can be made that short instructional clinics, daily systematic feedback and pre-setting criteria were effective in reducing student waiting time. The mean percentage of student waiting time decreased from a baseline mean of 33.6 to an intervention mean of 7.6 for Teacher One and from a baseline mean of 24.3 to an intervention mean of 5.2 for Teacher Three. For Teacher Two, the mean percentage of student waiting time decreased from an already low baseline mean of 13 to a Phase 1 intervention on waiting time mean of 8. However,

there was an increase in student waiting time from a Phase 1 intervention on waiting time mean of 8 to a Phase 2 intervention mean of 20. This may have been due to the nature of the activity. Once a modified game was implemented, with the same objectives, waiting time was reduced.

The final set of conclusions refers to the analysis of the qualitative data (interviews, telephone conversations and written materials) collected from the teachers.

21. Efforts to keep transition time and student waiting time to a minimum created increased stress and pressure. Teachers felt rushed to begin activities at the expense of time which they felt was needed for adequate instruction. It was suggested that sustained class periods under high ALT-PE conditions could promote teacher burn-out.

22. Teachers recognized the importance of ALT-PE conditions and showed support for it, but within reasonable boundaries. ALT-PE needs to be recognized as one of several goals within Physical Education, and that overemphasis of ALT-PE, in addition to creating problems for teachers as stated above, may result in a less humanized situation, a situation in which individual attention to specific student needs or problems would be minimized, if not eliminated.

23. In that increased levels of ALT-PE equated with high student activity, fewer discipline problems were noted.

24. In addition to the types of equipment involved and the nature of the activity, safety needs to be considered before setting

ALT-PE goal levels.

25. Teachers felt that increased levels of student activity requires increased class structure. In so doing, student opportunities for socialization, creativity and experimentation were decreased. Teachers expressed the feeling that physical education at the elementary level was one of the times during the school day that students had for these purposes, and that this should be taken into consideration when defining ALT-PE goal levels.

26. The short instructional clinics were effective vehicles for improving teaching skills and were definite aids in structuring progressions of lessons and utilization of class time.

Instructions and daily systematic feedback were successful and a cost effective method for changing teacher behaviors and for helping teachers to change student behaviors as shown through this study. Assuming that Academic Learning Time percentage for each student has a relationship with student achievement in physical education, and in noting the increase in ALT-PE, it could be said that student achievement in physical education may have improved through this study.

Recommendations for Further Study

This study conducted only at the elementary level represented an effort to change teacher behavior and/or classroom conditions in order to analyze the relationship of these teaching practices to the Academic Learning Time of students. Since this study followed the model first conducted by Birdwell (1980), it seems to continue to represent a model

for conducting further experimental studies involving ALT-PE. The following suggestions for further research will be categorized into three areas: additional experimental studies, descriptive studies, and process-product studies.

Recommendations for further experimental studies include:

1. Systematic replications of this study using subjects only at the elementary, middle or senior high school levels.

2. Additional intervention studies designed to increase ALT-PE as a directly manipulated dependent variable.

3. Using an inservice workshop as an intervention strategy, conduct an experimental study designed to increase ALT-PE.

Recommendations for further descriptive studies include:

1. Descriptive studies of physical education teachers using the ALT-PE system at only the elementary, middle or senior high school levels.

2. Descriptive studies of specific physical education activities in order to understand realistic goal levels for ALT-PE.

3. Descriptive studies to determine different teaching practices associated with high and low levels of ALT-PE.

Recommendations for process-product studies include:

1. Process-product studies to develop reliable and valid product measures of student performance in physical education. Correlations could be made between student achievement and the variable ALT-PE.

Academic Learning Time for a student in physical education is assumed to be related to student achievement. Valid product measures of motor skill acquisition in physical education must be established for ALT-PE to become a valid means for assessing student achievement and the effectiveness of teachers in physical education. When there are valid product measures, then it will be possible to determine the specific relationship between ALT and achievement in physical education.

APPENDIX A

December 9, 1981

Dawn Starnes, Physical Education Teacher
Gerald Waggoner, Physical Education Teacher
Highpoint Elementary School
6033 150th Avenue
Clearwater, Florida 33520

Dear Dawn and Gerald;

I would like to take this opportunity to ask for your assistance in a research project to be conducted within the Pinellas County School system during the 1981-1982 school year. Attached is a brief synopsis of the project and the responsibilities of each of the participating teachers. The research project will focus on selected elementary schools and is limited to the physical education area only. Both physical education teachers at each of the selected schools are needed to complete this project. Each participating teacher will receive component points for their involvement.

The project will focus on student behavior during physical education class. It does not focus on the teacher, and in no way evaluates or assesses teacher performance. The project has been approved by George Jones, county supervisor or Physical Education, and it was at his suggestion that you and your school be contacted.

I would appreciate your time in reading through the attached material. I will contact both of you by telephone during the week of December 14 through 18 to discuss the project in further detail. If you have any questions in the interim, feel free to call me at home (734-1336) or at San Jose Elementary School (736-1478). I look forward to working with you in the future. Thank you for your time and consideration.

Respectfully;

Claire L. Hart

Claire L. Hart
Physical Education Teacher
San Jose Elementary School

As previously stated, the research project will involve both physical education teachers at your school. All teachers involved in the project will receive component points as compensation for their participation. I will train one teacher at each school as an observer in order to collect data for the project. The trained observer will then collect data on student behavior in the other physical education teacher's class. The length of observation will be for one class a day, four times a week, for approximately ten weeks (a total of 30 class periods is the required minimum). The following explains in greater detail the expectations and time involvement for each teacher. Each of you will have to decide on what role you wish to play.

Teacher A. (as observer)

As an observer, you will be trained to collect data with a coding instrument. The nature of the coding instrument will be discussed further with the observer at our initial meeting. The number of training sessions required before actual observation begins will depend on how quickly you understand the coding instrument and how to use it. Once trained, the observer will collect data on student behavior in one class of physical education taught by the other teacher at your school. Observation will continue until a minimum of 30 observation periods has been reached. The observation process will take place during the Winter and part of Spring. Observers will be expected to provide me with a completed coding sheet the same day observation takes place by dropping off the sheet at a predetermined location.

Teacher B. (classes being observed)

As the teacher whose students are being observed, one of your classes will be observed by the other physical education teacher at your school four times a week, for ten weeks. Throughout this period data will be collected on student behavior. The first part of the project will consist of observation without providing any feedback to you as the teacher. During the second part of the project, I will be sharing with you the results of the data collection and asking you to spend a total of four hours participating in a series of short instructional workshops. The purpose of the workshops is to provide you with suggested ways to make positive changes in student behavior. You will then be asked to apply, where applicable, the material discussed during the workshops. You will be provided with ongoing feedback for the duration of the project in order to monitor any changes that take place in student behavior.

APPENDIX B

December 9, 1981

Mr. Arthur Fernandez, Principal
Lynch Elementary School
1901 71st Avenue North
St. Petersburg, Florida 33702

Dear Mr. Fernandez;

I would like to take this opportunity to ask for your assistance in a research project to be conducted within the Pinellas County School system during the 1981-1982 school year. Attached is a brief synopsis of the project. The research project will focus onselected elementary schools, and be limited to the physical education area only. No additional paperwork is required for principals of the participating schools. The project has been approved by George Jones, the county supervisor for Physical Education, and it was at his suggestion that you and your school be contacted. Teacher involvement will be compensated through component points.

I would appreciate your time in reading through the attached material. Both of the physical education teachers at your school have been sent a letter outlining the general nature of the project. I request that you do not discuss this with your teachers until we have talked further. I will contact you by telephone during the week of December 14 through 18 to discuss the project in further detail. Thank you for your time and consideration.

Respectfully;

Claire L. Hart

Claire L. Hart
Physical Education Teacher
San Jose Elementary School

APPENDIX C

Academic Learning Time - Physical Education

1982

Coding Manual

School of Health, Physical Education and Recreation

College of Education

The Ohio State University

Introduction

This is the training manual which you will use to prepare yourself to utilize the Academic Learning Time - Physical Education Observation System (ALT-PE). The system is designed for on - site observations of students in physical education at all grade levels.

The coding system is based on interval recording techniques in which student behaviors are observed for short periods of time and recorded onto the ALT-PE coding sheet.

This manual is intended to take you through the training procedures for the ALT-PE system in a sequenced, step - wise fashion. It is advisable to read through the entire manual first and then return to the first task. Seven tasks have been prepared to teach you to reliably code with this system. Tasks 1 through 3 may be completed on your own and at your own pace within five (5) days of receiving this manual. Tasks 4 through 7 must be completed with the principle investigator. Once the criterion for Task 7 has been met two times in succession, you will be ready to begin actual data collection in the public school classrooms. If you have any questions, feel free to contact me at San Jose Elementary School (736-1478) or at home (734-1336). Please do NOT share this with the teacher of the class to be observed.

The Concept of Academic Learning Time

The notion that student engagement with the subject matter is a powerful predictor of achievement is not new. In fact, few variables have enjoyed such a long and productive history in educational research. The current use of Academic Learning Time - Physical Education (ALT-PE) is an application of a well tested notion to another subject matter. What is curious is that it has taken us so long to adopt a variable with such strong face validity and such an impressive research history.

There is ample evidence that early educational researchers viewed time-on-task and student attention as potent explanatory variables. In his famous Life In Classrooms Philip Jackson (1968) reviewed the early research on student involvement and wondered, in conclusion, why similar research variables were not then currently popular.

> In education courses and in the professional literature, involvement and its opposite, some form of detachment, are largely ignored. Yet from a logical point of view few topics would seem to have greater relevance for the teacher's work. Certainly no educational goals are more immediate than those that concern the establishment and maintenance of the student's absorption in the task at hand. Almost all other objectives are dependent for their accomplishment upon the attainment of this basic condition. Yet this fact seems to have been more appreciated in the past than it is today. (p.85)

What might have been true in 1968, at the time of Jackson's review, is much less true today. Student involvement in the subject matter lies at the very center of much of the teacher effectiveness research currently being conducted -- and, it has continued to yield impressive results. The descriptors have been many -- time-on-task, student involvement, student engagement, student attention, academic learning time, opportunity to respond -- yet they obviously refer to a common phenomenon, and their

differences lie in the degree to which they measure that phenomenon most validly and reliably.

Student involvement with the subject matter was resurrected gradually as a research construct as investigators began to focus on student behavior as well as teacher behavior. The era in which systematic observation of teaching developed has been rightfully described (Cheffers, 1977; Locke, 1977) as the watershed period in which teacher effectiveness research became productive after a long period of false starts and nonsignificant differences. But, this period also led researchers to focus primarily on the teacher and his/her activities, with only secondary status given to student activity. What this important period of educational research did accomplish very well was to equip researchers with the tools of systematic observation, which are the fundamental skills for conducting teacher effectiveness research.

Two important papers during this era began to lead researchers away from an exclusive focus on teachers and towards a more intensive study of student activity. Carroll's 1963 paper "A model for school learning" suggested that student opportunity to learn was a crucial variable and that quality instruction is that which matches materials to student aptitude so that mastery can be achieved within projected time limits. Carroll's notions of time, opportunity, and matching materials to aptitudes led eventually to Bloom's work on mastery learning and refocused many researcher's attentions on student time and quality of involvement with materials as important factors in achievement. In 1976 Harnischfeger and Wiley argued persuasively that student activity within the educational setting was the key to understanding the dynamics of learning.

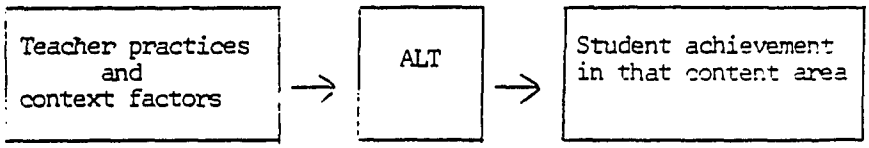
> A fruitful theory of teaching and learning must treat the pupil's activity as causally intermediate between the teacher's implementation of the curriculum and the pupil's learning. Pupil pursuits are therefore the focus of our conception of teaching-learning processes.

This view became virtually standardized when Dunkin and Biddle (1974) included student process variables in their model for teaching research.

In the early 1970's the National Institute of Education funded the Beginning Teacher Evaluation Study (BTES), which was administered by the California Commission for Teacher Preparation and Licensing and conducted primarily by the Far West Laboratory for Educational Research and Development. From the very outset, the investigators who developed and carried out this major research effort decided that student contact with appropriate curricular materials would lie at the center of their research focus (Berlinner, 1979). Three measures of instructional time were developed as central to the BTES project. Allocated time refers to the time a teacher allocates for instruction and practice in a particular subject matter area. Engaged time refers to that portion of allocated time that a student is actually involved with the subject matter. Academic Learning Time (ALT) is that portion of engaged time when the student is involved with materials that are appropriate to his/her abilities resulting in a high success rate and low error rate.

> The variable used in BTES research is the accrued engaged time in a particular content area using materials that are not difficult for the student. This complex variable is called Academic Learning Time (ALT). Although the relationship is probably not linear, the accrual of ALT is expected to be a strong positive correlate of achievement. (Berlinner, 1979, p. 124.)

This emphasis on ALT resulted in a slightly different research model than those typically utilized in process-product paradigms in teacher effectiveness studies. Rather than attempting to link teacher activities directly to student achievement, the ALT emphasis allowed the BTES researchers to pursue a paradigm in which student activity, in the form of ALT, stood between the teacher's activities and the subsequent student achievement. The model appears below.



The BTES researchers did find that ALT was a positive predictor of student achievement and these results led other researchers to incorporate ALT variables in their own research programs. In his more recent review of ALT variables, Smyth (1981) reached the following conclusion.

> The robustness of this research variable is little short of remarkable. I believe that part of the resilience of this variable and its persistent pursuit over time is related to its potential utility both as an index of classroom effectiveness, as well as the key it provides for unlocking some of the complexities of life in classrooms. (p. i)

While not all time-on-task variables are identical, they are sufficiently similar to form a reasonable descriptor under which to subsume a substantial amount of educational research. As one attempts to utilize a concept such as ALT in a new area, such as physical education, one must feel confident that it is a strong variable. The brief glimpse taken at the history of these variables in this section lends confidence to the researcher who needs to be satisfied that results from classroom

will generalize to the gymnasium. Borg's 1979 review of time-on-task variables strengthens that impression even more.

> When research over the past 36 years shows consistent positive relationships between time on task and achievement, and when we find 16 studies differing in virtually every aspect of design and yet yielding consistent positive results, we can, in fact, be very confident that the relationships found are real and enduring. (p. 7)

It was with this level of confidence that ALT-PE was developed, with the expectations that gymnasia where students accumulated high percentages of ALT-PE would be those where students achieved more. This will be particularly appealing to physical educators who have found it difficult to conceptualize process-product studies because of the difficulty of measuring outcomes in physical education. Valid, reliable measures of student achievement in physical education ard hard to come by. For certain activities, such as bowling, the outcomes are measured by the performance itself. But, for many other activities, such as all of the interactive team sports, the outcomes are difficult to measure, especially on an on-going basis. Students in physical education produce few permanent products, such as the classroom teacher regularly collects with spelling tests and mathematic assignments. No "standardized" tests exist that are at all analagous to the many available to the classroom researcher. The fact is that educational outcomes involving movement are currently more difficult to measure than those involving different levels of cognition. Thus, ALT appears to be not only a powerful way in which to make judgments about teacher practices but it also offers a strong proxy for student achievement. Indeed, Berlinner (1979) has argued that ALT may be a <u>better</u> measure of student learning than are achievement measures.

> And, finally, if learning primarily takes place when students are engaged with materials and activities that are of an easy level of difficulty for that particular student, then ALT becomes an important operationally defined behavioral indicator of student learning. The construct of ALT has an intriguing virtue. One does not need to wait until the end of the school year to decide if learning has taken place. One can study learning as it happens, if the construct of ALT is accepted as it has been defined. In the conception of instruction that has guided the research that has been conducted and on which this chapter is based, ALT and learning are synonymous. (p. 134)

Early ALT-PE Efforts

It was at the annual meeting of the American Educational Research Association in Toronto in 1978 that the notion of ALT-PE was born. Several BTES papers were presented at those meetings. The research results and the logic of the model were impressive to a physical education researcher searching for a criterion variable through which effective teaching in physical education might be investigated. In March, 1979, at the annual meeting of the American Alliance for Health, Physical Education and Recreation, Siedentop, Birdwell, and Metzler (1979) presented a series of papers aimed at explaining the ALT-PE model and presenting the coding format and conventions.

Metzler (1980) completed the first ALT-PE study, a descriptive study of physical education teachers using the ALT-PE system. Rate (1980) then conducted a similar study focusing on interscholastic athletic settings. Birdwell (1980) and Whaley (1980) followed with the first experimental studies utilizing ALT-PE as a criterion variable against which to evaluate changes in certain teachers activities thought to be closely linked to levels of ALT-PE in physical education classes.

Each of these studies was conducted at Ohio State.

At the 1980 AAHPER convention in Detroit a symposium entitled "Academic Learning Time in Physical Education: a 1980 Update" was held with Daryl Siedentop as chair. Metzler's and Whaley's data were presented along with data from two studies that had been conducted at the University of Texas at Austin by Susan Aufderheide, Thom McKenzie, and Claudia Knowles, one focusing on using ALT-PE as a criterion variable for verifying the degree to which mainstreamed students had equal access to learn and the other study focusing on levels of ALT-PE in beginning swimming classes for children.

By this time the notion of ALT-PE has spread widely and rapidly among physical educators interested in teaching research. At the 1981 AAHPERD convention in Boston another ALT-PE symposium was held with Frank Rife, University of Massachusetts as chair.

In addition to these efforts ALT-PE was being used in studies conducted by Maurice Pieron at the University of Liege in Belgium, by John McLeish and colleagues at the University of Victoria in British Columbia, by Jean Brunelle and colleagues at the University of Laval in Quebec, and by George Graham and colleagues at the University of Georgia.

During this initial ALT effort in physical education, questions arose as to manner in which ALT-PE was conceptualized and operationalized. Further research in education and in physical education also sharpened our understanding of ALT and its relationship to achievement. By the spring of 1981 it became apparent that a revision in the system was timely and necessary.

ALT-PE is currently conceptualized as a two level, hierarchical decision system. The first level of the system requires a decision on the context of the setting under observation. This context decision is made by observing the class or squad as a whole. For each observation sample a decision is made as to whether the class/squad is in general content or in subject matter content. General and subject matter content categories form a facet (Dunkin & Biddle, 1974) in that all activity has to be codable into a category that is either general content or subject matter content.

The subject matter content is further subdivided into two areas, knowledge content and motor content. These two subdivisions also form a facet, in that all physical education content has to be classifiable into a knowledge or motor category. The context level categories are schematically represented below.

Context Level Categories - ALT-PE

General Content	Subject Matter Content	
	Knowledge	Motor
transition	technique	skill practice
management	strategy	scrimmage/routine
break	rules	game
warm-up	social behavior	fitness
	background	

This first level decision in the ALT-PE system provides information concerning the context within which specific individual student behavior is occurring.

The second level in the decision sequence involves observations of individual learner involvement. The learner involvement decision is made by observing individual students. While the first level context decision focused on the class as a whole, requiring only one judgement representing the entire group observed, the decision at the learner involvement level requires separate judgements for each student included within the observation sample. The learner involvement level has two sets of categories which form a facet, meaning that everything individual students are doing has to be classifiable into one of the categories. One set of categories is subsumed under the descriptor not motor engaged. A second set of categories is subsumed under the heading motor engaged. The term "motor" as used in the learner involvement level categories refers to motor involvement with subject matter activities related to the goals of the setting. Thus, the categories under the heading not motor engaged may include motor activity, but not subject matter oriented motor activity. This distinction will be made more clear in the sections dealing with definitions and examples. The learner involvement level categories are schematically represented below.

Learner Involvement Categories - ALT-PE

Not Motor Engaged	Motor Engaged
interim	motor appropriate
waiting	motor inappropriate
off-task	supporting
on-task	
cognitive	

The coding conventions for this two level decision system are straightforward. If a general content or subject matter knowledge category is

chosen at the context level, then the second level decision is from categories in the not motor engaged group. If a subject matter motor category is chosen at the context level, then the second level decision utilizes the entire learner involvement category system. Any observation sample in which motor appropriate is chosen for the second level decision becomes one unit of ALT-PE.

To review, the ALT-PE system involves a group-focused context decision and an individually focused learner involvement decision for each observation sample. Those observation samples in which a subject matter content motor category is chosen at the context level and motor appropriate is chosen at the learner involvement level are ALT-PE samples. The decision system is summarized below on a step-by-step basis.

Step 1 Context level decision.

What is the context of the class? What is the class as a whole doing?

Choices:	General content	Knowledge	Motor
	transition	technique	skill practice
	management	strategy	scrimmage
	break	rules	game
	warm-up	social beh.	fitness
		background	

Step 2 Learner involvement decision.

What is the nature of the individual learner's engagement? What is the individual student doing?

Choices:	Not Motor Engaged	Motor Engaged
	interim	motor appropriate
	waiting	motor inappropriate
	off-task	supporting
	on-task	
	cognitive	

ALT-PE Category Definitions

Context Level

The first level of decision making focuses on the class as a whole (or a subset of the class) and is designed to describe the context within which student behavior is occurring. There are three major subdivisions at the context level -- general content, subject matter knowledge content, and subject matter motor content.

General Content	refers to class time when students are not intended to be involved in physical education activities.
SM Knowledge Content	refers to class time when the primary focus is on knowledge related to physical education content.
SM Motor Content	refers to class time when the primary focus is on motor involvement in physical education activities.

Each of the three main subdivisions at the context level has categories which describe more specifically the nature of the setting within which individual student behavior is occurring. These categories are defined as follows.

General Content Categories

Transition (T)	Time devoted to managerial and organizational activities related to instruction such as team selection, changing equipment, moving from one space to another, changing stations, teacher explanation of an organizational arrangement, and changing activities within a lesson.
Management (M)	Time devoted to class business that is unrelated to instructional activity such as taking attendance, discussing a field trip, lecturing about appropriate behavior in the gymnasium, or collecting money for the yearbook.

Break (B)	Time devoted to rest and/or discussion of nonsubject matter related issues such as getting a drink of water, talking about last night's ball game, telling jokes, celebrating the birthday of a class member, or discussing the results of a student election.
Warm Up (WU)	Time devoted to routine execution of physical activities whose purpose is to prepare the individual for engaging in further activity, but not designed to alter the state of the individual on a long term basis, such as a period of light exercises to begin a class, stretching exercises prior to a lesson, or a cooling down activity to terminate a lesson.

Subject Matter Knowledge Categories

Technique (TN)	Time devoted to transmitting information concerning the physical form (topography) of a motor skill such as listening to a lecture, watching a demonstration, or watching a film.
Strategy (ST)	Time devoted to transmitting information concerning plans of action for performing either individually or as a group such as explanation of a zone defense, demonstration of an individual move, or discussion of how best to move the ball down a field.
Rules (R)	Time devoted to transmitting information about regulations which govern activity related to the subject matter such as explanation of the rules of a game, demonstration of a specific rule violation, or viewing a film depicting the rules of volleyball (time devoted to transmitting information about rules governing general student behavior in physical education are coded management).
Social Behavior (SB)	Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity such as explanation of what constitutes sportsmanship in soccer, discussion of the ethics of reporting one's own violations in a game, or explanations of proper ways to respond to officials in a game.

Background (BK)	Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

Subject Matter Motor Categories

Skill Practice (P)	Time devoted to practice of skills or chains of skills outside the applied context with the primary goal of skill development, such as a circle drill in passing a volleyball, one against one practice of dribbling a basketball, exploration of movement forms, practicing the Schottische step, or practicing a particular skill on a balance beam.
Scrimmage/routine (S)	Time devoted to refinement and extension of skills in an applied setting (in a setting which is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants — such as, a half court five on five basketball activity, the practice of a complete free exercise routine, six against six volleyball (all with instructions, suggestions, and feedback during the scrimmage).
Game (G)	Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach — such as a volleyball game, a complete balance beam routine, the performance of a folk dance, or running a half-mile race.
Fitness (F)	Time devoted to activities whose major purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility such as aerobic dance, distance running, weight lifting, or agility training (the activities should be of sufficient intensity, frequency, and duration so as to alter the state of the individual).

Learner Involvement Level

The second level of decision making focuses on the individual learner(s) and is designed to describe the nature of the learner(s) involvement in a more specific way. There are two major subdivisions at the learner involvement

level — not motor engaged and motor engaged.

Not Motor Engaged	refers to all involvement other than motor involvement with subject matter oriented motor activities.
Motor Engaged	refers to motor involvement with subject matter oriented motor activities.

Each of the two main subdivisions at the learner involvement level has categories which describe more specifically the nature of the learner's involvement. These categories are defined as follows.

Not Motor Engaged Categories

Interim (I)	The student is engaged in a noninstructional aspect of an ongoing activity such as retrieving balls, fixing equipment, retrieving arrows, or changing sides of a court in a tennis match.
Waiting (W)	Student has completed a task and is awaiting the next instructions or opportunity to respond such as waiting in line for a turn, having arrived at an assigned space waiting for the next teacher direction, standing on a sideline waiting to get in a game, or having organized into the appropriate formation waiting for an activity to begin.
Off-task (OF)	The student is either not engaged in an activity he/she should be engaged in or is engaged in activity other than the one he/she should be engaged in — behavior disruptions, misbehavior, and general off-task behavior, such as talking when a teacher is explaining a skill, misusing equipment, fooling around, fighting, disrupting a drill through inappropriate behavior.
On-task (ON)	The student is appropriately engaged carrying out an assigned non-subject matter task (a management task, a transition task, a warm up task) such as moving into squads, helping to place equipment, counting off, doing warm up exercises, or moving from the gym to a playing field.

Cognitive (C)	The student is appropriately involved in a cognitive task such as listening to a teacher describe a game, listening to verbal instructions about how to organize, watching a demonstration, participating in a discussion, or watching a film.
Motor Engaged Categories	
Motor appropriate (MA)	The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.
Motor inappropriate (MI)	The student is engaged in a subject matter oriented motor activity but the activity-task is either too difficult for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.
Supporting (MS)	The student is engaged in subject matter motor activity the purpose of which is to assist others learn or perform the activity such as spotting in gymnastics, feeding balls to a hitter in a tennis lesson, throwing a volleyball to a partner who is practicing set up passing, or clapping a rhythm for a group of students who are practicing a movement pattern.

Measuring ALT

There are several options for measuring ALT. Each of these will be discussed in this section. The decision as to which measurement technique is most appropriate depends upon the purposes for which the data are being collected. The options for measuring ALT include interval recording, group time sampling, and/or duration recording.

Interval Recording

Interval recording is an observation technique wherein an individual or group is observed for a specific length of time (an interval) and a decision is made as to what behavior category best represents the behavior of the individual or group during that time. Interval recording is a sampling process in that samples of behavior are collected periodically. As with any sampling process, the more samples that are collected and the more evenly these samples are distributed across the total time, the more validly do the samples represent what actually transpired during the total length of the observation session.

The length of the observation interval is crucial to the reliability of the data. If the interval is long, several behaviors may occur and the observer will have difficulty choosing which behavior best characterizes the entire interval. The shorter the interval, the easier is the decision process, and the more reliable are the data. Shorter intervals also allow for more interval samples to be taken in a given amount of time.

Interval observation techniques typically utilize an observe-record format in that one interval is used to observe the subject(s) and the next interval is used to record the observations. In ALT-PE research, we have

typically used an interval length ranging from six to ten seconds. Thus, we might use a six second observe, six second record format. When beginning to utilize ALT-PE, it is wise to utilize a longer interval. Often it is useful to utilize a 10 second observe, 15 second record format to begin with and then gradually to reduce the interval size as coding proficiency is achieved. Interval data are typically expressed as a percentage of total intervals. Since each interval represents a measure of time, total time per category can be estimated.

Group time sampling

Group time sampling refers to the periodic recording of the behavior of members of a group, for instance one squad within a class or the entire class. Group time sampling is done at a specific point in time. Each individual is observed momentarily and his/her behavior at that moment is categorized. Once a person's behavior has been observed and categorized, the observer moves on to another subject and does not return to a subject who has already been observed. The technique is best accomplished if the observer always scans in a specified direction, typically from left to right. To scan an entire physical education class utilizing the ALT-PE system might take as long as 30-60 seconds to begin with. However, as coding proficiency is achieved, the group time sample should take less time.

The samples should be spaced evenly throughout the total observation period. For example, one group time sample every three minutes in a 45 minute class would yield 15 samples of the behavior of the entire group relative to the ALT-PE categories. If the full ALT-PE system is not used, and some simpler modification is instead chosen, then the group time sample decision process will take even less time per sample and samples might be done

every two minutes. Group time sample data are typically expressed in percentages of the total number of students observed per sample.

Duration recording

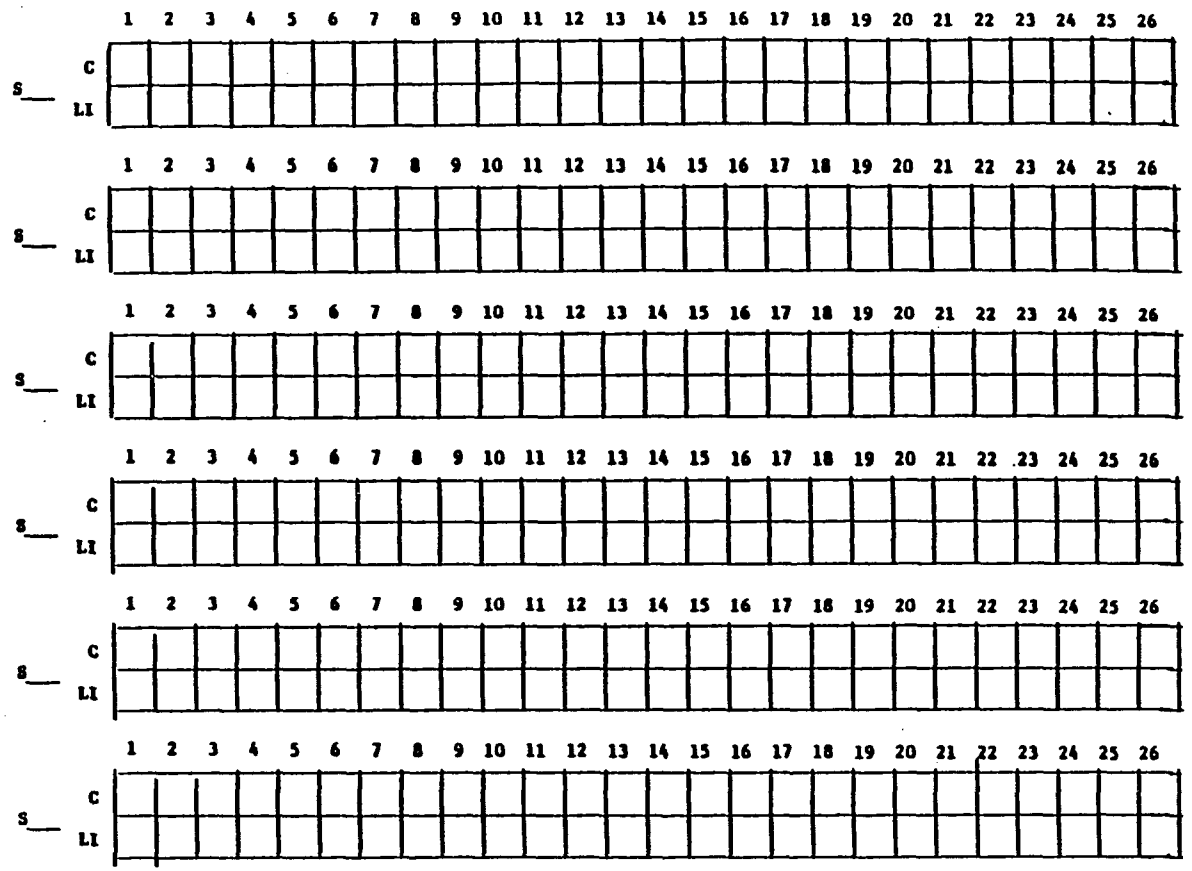
Duration recording refers to the continuous monitoring and recording of the length of time in which a subject or group is involved in specific behavior categories. Duration recording is particularly useful for measuring the context level of the ALT-PE system. Another option would be to measure ALT-PE directly in individual students via duration recording. Duration recording data are typically expressed as a percentage of the total time of the observation session.

Option #1: The Interval System

The original ALT-PE system (Siedentop, Birdwell, & Metzler, 1979) was conceptualized as an interval recording system. The ALT-PE revision is still primarily useful as an interval system, particularly as a means for collecting data in descriptive/analytic or experimental research. The interval system produces highly reliable data and, if the intervals are short and spread evenly across the available time, the data will be representative of data collected continuously.

The coding sheet shown on page 19 depicts the total ALT-PE interval system. There is space on each coding sheet to record 156 samples of behavior. These 156 samples could be for one student, 78 samples each for two students, 52 samples each for three students, or 26 samples each for six students. The decision as to how many individual students to observe depends upon the purpose of the observation session. When doing descriptive research, it has been our strategy to have a teacher identify several highly skilled students, several average students, and several low skilled students. We then

ALT-PE CODING SHEET



Context Level			Learner Involvement Level	
General Content	SM Knowledge	SM Motor	Not Motor Engaged	Motor Engaged
Transition (T)	Technique (TN)	Skill Practice (P)	Interim (I)	Motor appropriate (Ma)
Management (M)	Strategy (ST)	Scrimmage/Routine (S)	Waiting (W)	Motor inappropriate (Mi)
Break (B)	Rules (R)	Game (G)	Off-task (Of)	Supporting (Ms)
Warm Up (WU)	Social Behavior (SB)	Fitness (F)	On-task (On)	
	Background (BK)		Cognitive (C)	

ALT-PE CODING SHEET
DEMOGRAPHIC INFORMATION

Date:_____ Teacher :_____ School : _____

Class/Activity : _____ Observer : _____

Start time: _____ Stop time : _____ Duration : _____ Page _____ of _____

This observation is day _____ of _____ days in this unit.

The teacher allocated _____ minutes of activity time for this lesson.

The source of this allocation information was (asked teacher, saw lesson plan).

Observer comments on this class.

Data Summary

Total time _____ Allocated practice time _____ ALT-PE _____

Context level data: General content _____ SH Knowledge _____ SH Motor _____

Learner involvement data: Not motor engaged _____ motor engaged _____

randomly select one student from each of those groups, assuming that the average data for the three students would be representative of the class mean.

If three students were selected for observation, the first row of intervals would be assigned to student #1, the second row to student #2, the third row to student #3, the fourth row to student #1, and so on. The actual coding, when using more than one student, moves down columns before moving across rows. The first observe-record interval would focus on student #1, the second observe-record interval on student #2, and so on.

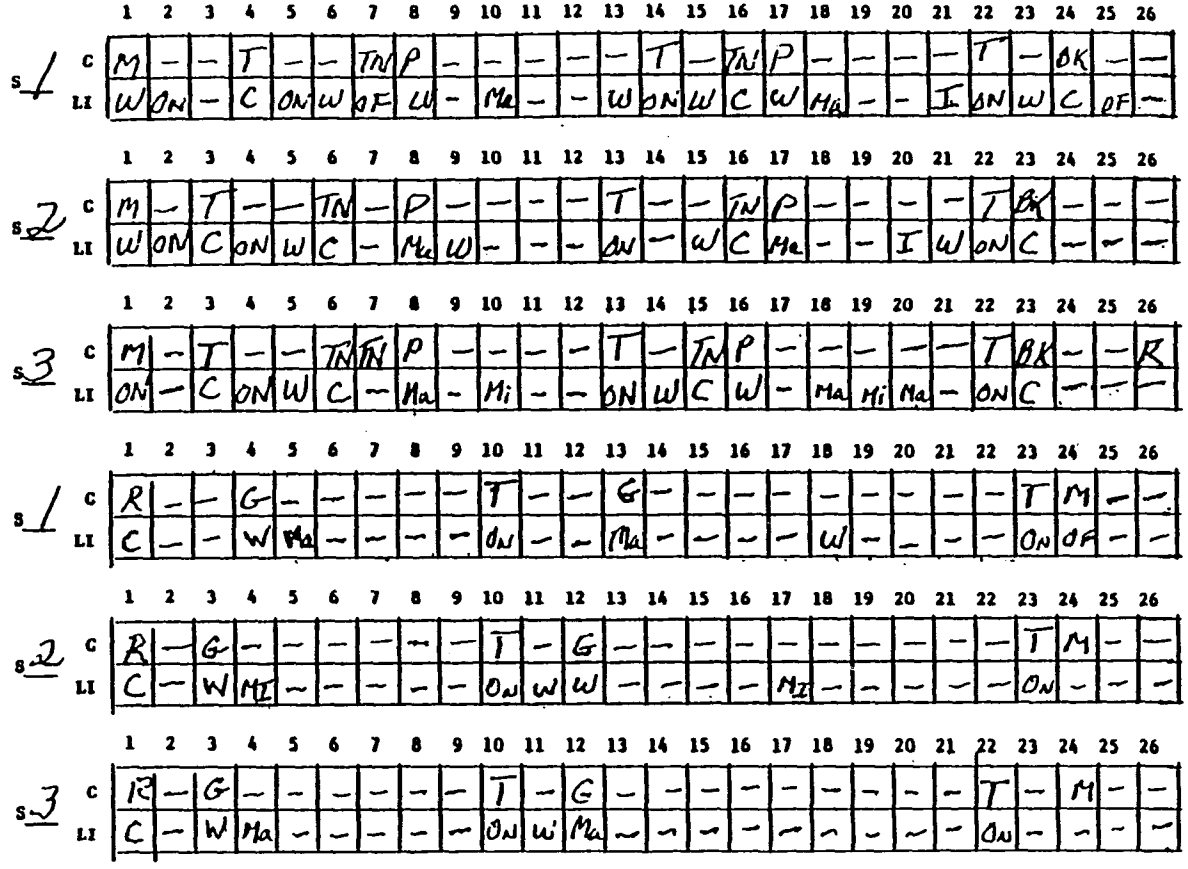
The categories are written at the bottom of the coding sheet with a symbol for each category. The appropriate symbol is written in the appropriate box for each observation interval. If adjacent observation intervals (across rows) have the same category, this may be represented by a dash (-) rather than by repeating the symbol.

For each observation interval, the context is first noted and then the specific student is observed to ascertain the nature of his/her involvement. These observations are then transferred to the coding sheet during the "record" part of the interval, utilizing the symbol system shown at the bottom of the page.

A major benefit of the interval system is that it allows for an interval by interval comparison of the degree of agreement between two independent observers (see section on reliability).

Interval systems require some small hardware to utilize them well. A tape recorder small enough to carry around easily is essential. Cassette tapes are preprogrammed to cue the observer to the appropriate observe-record intervals. This frees the observer from having to worry about who to observe when. The observer simply listens to the cues from the tape. An ear

ALT-PE CODING SHEET



Context Level

General Content	SM Knowledge	SM Motor
Transition (T)	Technique (TN)	Skill Practice (P)
Management (M)	Strategy (ST)	Scrimmage/Routine (S)
Break (B)	Rules (R)	Game (G)
Warm Up (WU)	Social Behavior (SB)	Fitness (F)
	Background (BK)	

Learner Involvement Level

Not Motor Engaged	Motor Engaged
Interim (I)	Motor appropriate (Ma)
Waiting (W)	Motor inappropriate (MI)
Off-task (Of)	Supporting (Ms)
On-task (On)	
Cognitive (C)	

ALT-PE CODING SHEET
DEMOGRAPHIC INFORMATION

Date: 10/12 Teacher: Mr Jones School: South

Class/Activity: Volleyball Observer: Sidentop

Start time: 10:02 Stop time: 10:42+ Duration: 41-42 m Page 1 of 1

This observation is day 6 of 8 days in this unit.

The teacher allocated 32 minutes of activity time for this lesson.

The source of this allocation information was (~~asked teacher~~, saw lesson plan).

format:
2 sec observe
8 sec record

Observer comments on this class.

- some waiting at transitions.
- practice tasks well designed
- some students didn't have sufficient skills for game play (see SM2 data for game context)
- good, quick, clear instructions, but need better accountability

Data Summary

Total time 42 m Allocated practice time 32 m ALT-PE %: 42/156 = 27%

Context level data: General content 30/156 = 30% SM Knowledge 26/152 = 17% SM Motor 83/156 = 53%

Learner involvement data: Not motor engaged % 64 (99/156) Motor engaged % 46 (57/156)

How to Read the Sample Coding Sheet

ALT-PE coding provides a symbolic "script" of a lesson. With a little experience, a completed coding sheet can be easily "read" to provide a narrative description of what went on during a lesson. The sample lesson would be read as follows. (The "reading" goes down column 1 for S's 1, 2, and 3 and then across to column 2. The upper half of the coding sheet is the first half of the lesson. The bottom half of the coding sheet is the second half of the lesson.)

The lesson began with a managerial sequence which lasted for 7 intervals. This was followed by a rather length transition episode (9 intervals which represents almost 2½ minutes in the 8 second observe 8 second record format used here). There is then a brief focus on technique which is followed by a length practice episode. A brief transition followed by another brief focus on technique is then followed by a second practice episode. A short transition then leads to an episode focusing on background material which leads into a brief session on rules. The remainder of the lesson is spent in a game context with a transition (to change teams). The lesson ends with a managerial episode.

There is some waiting during the transition episodes. S-1 was off task several times. S-2 didn't have the skills to actually play the game appropriately. When the teacher was giving information (technique, background, or transition) the students generally attended. The students were basically on task during the management and transition episodes, but typically had to wait after completing the transition tasks.

The lesson is a fairly typical team sport lesson. Only 27% of the intervals were ALT-PE intervals. Students moved from a practice task to a game context with no scrimmage opportunity.

jack is very helpful because it allows the cues to be heard clearly by the observer but is unobtrusive for those being observed. What the observer hears can range from simple "observe" and "record" cues to more specifically programmed instructions such as "observe subject 2 for interval 23". The degree of specificity depends on the experience of the observer, the needs of the observation session, and the personal preferences of the observer.

A completed interval recording coding sheet is shown on page 22. These data could be summarized in several different ways, but the simplest is to express each category as a percentage of total intervals. If only ALT-PE figures are needed quickly, then the intervals in which "MA" is recorded at the learner involvement level are ALT-PE intervals. These can be counted and divided by the total number of intervals to arrive at an ALT-PE percentage figure. The total length of the observation session can then be multiplied by this percentage figure to get an estimate of total time in ALT-PE.

Option #2: The Supervision System

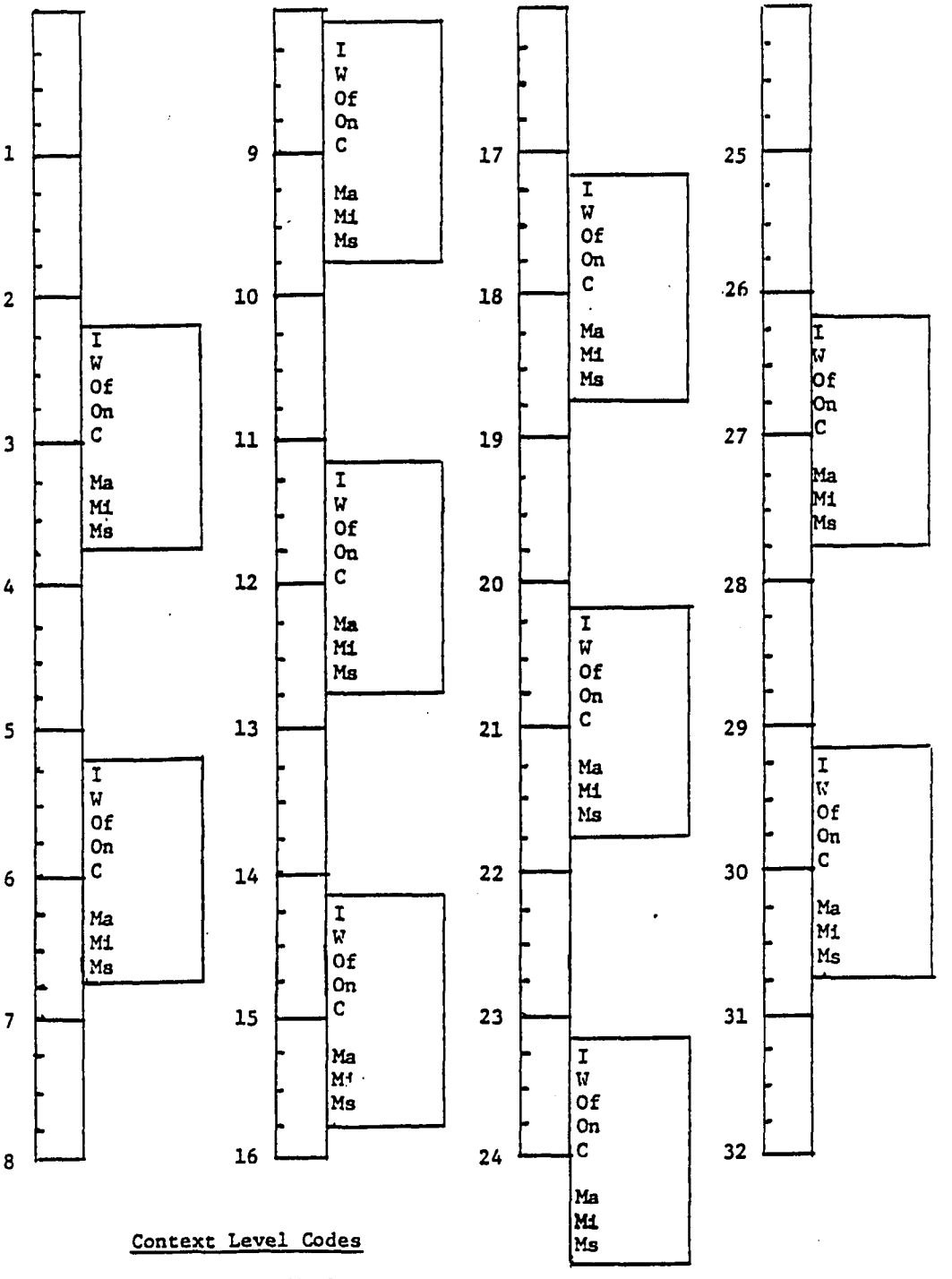
While interval recording no doubt presents the most complete ALT-PE picture, it is not the most economical. ALT-PE is probably the best single criterion variable now available for making on-site judgements about teaching effectiveness (Siedentop, in press). This means that ALT-PE should prove to be enormously useful for coding instruments designed primarily for supervision of field experiences. But, the supervision instrument no doubt also should look at other salient variables, such as skill feedback, behavior feedback, accountability responses, and the like. The system shown on page 27 utilizes a combination of duration and group time sampling to provide a fairly complete ALT-PE picture while still allowing the observer time to

code other items as well.

The supervision system utilizes a duration recording time line (Siedentop, in press) to measure the context level categories of ALT-PE and periodic group time sampling to measure the learner involvement categories of ALT-PE. Duration recording of the context level categories provides useful information for supervision purposes as well as for research purposes. It divides the total lesson into chunks of time which can be later totaled to provide an overall picture of the amount of time devoted each category at the context level. The time line is a series of vertical bars marked for time. The observer merely makes a horizontal line at the point where the context changes from one category to another, for example, from management to transition or from transition to skill practice. The appropriate coding symbol is placed within the time line in the "box" created by the two horizontal strokes that indicate the beginning and end of a particular context episode. This context decision is usually easy to make and contexts often remain stable.

In this system, group time sampling is done once every three minutes. The observer scans the group in a predetermined fashion (typically from left to right) and decides how to characterize the involvement of each individual learner. The learner involvement decision is still based on the individual learner! All learners can be included in the group time sample or a predetermined subset of learners can be observed. Since the group time sample is done only every three minutes, the observer has time between group time samples to observe and record other kinds of teacher or learner behavior that is thought to be important. A completed coding sheet of this supervision system is shown on page 29. The context level data from this system would be expressed as a percentage of total time. The learner involvement data would be expressed as a percentage of the number of students

ALT-PE CODING SHEET



Context Level Codes

General Content - T, M, B, WU
SM Knowledge - TN, ST, R, SB, BK
SM Motor - P, S, G, F

ALT-PE CODING SHEET
DEMOGRAPHIC INFORMATION

Date:_____ Teacher: _____ School:_____

Class/Activity: _____ Observer: _____

Start time: _____ Stop time: _____ Duration: _____ Page _____ of _____

This observation is day _____ of _____ days in this unit.

The t eacher allocated _____ minutes of activity time for this lesson.

The source of this allocation information was (asked teacher, saw lesson plan).

Observer comments on this class.

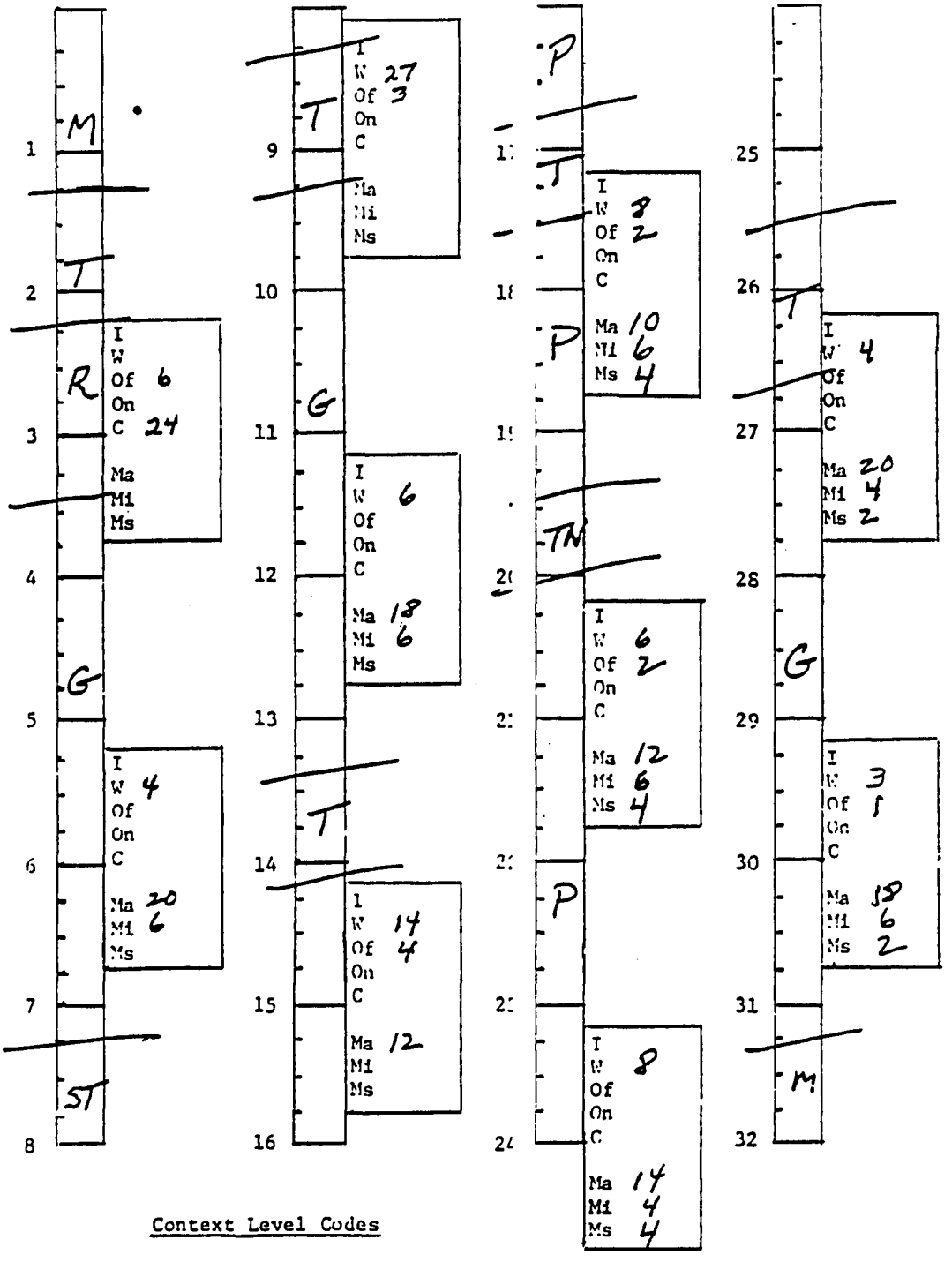
Data Summary

Total time _____ Allocated practice time _____ ALT-PE % _____

Context level data: General content _____ SM Knowledge _____ SM Motor _____

Learner involvement data: Not motor engaged % _____ Motor engaged % _____

ALT-PE CODING SHEET



Context Level Codes

General Content - T, M, B, WU
SM Knowledge - TN, ST, R, SB, BK
SM Motor - P, S, G, F

observed in each sample.

For supervision purposes, it might be thought that the entire learner involvement category system might not be needed. If only ALT-PE data are thought to be relevant to the purposes of the experience, then the group time sample can be used to simply count the number of students whose behavior indicates that they are in the motor appropriate category. Indeed, any subset of the learner involvement categories could be used depending on the amount of information the observer wants to record.

Option #3: Measuring ALT-PE only

The complete ALT-PE system yields a great deal of useful information. For example, use of the entire system will yield data on amount of time in transitions, management, and practice. It will also show the degree to which time devoted to practice for the group is actually translated into motor engaged time for the individual student (this information is yielded by examining the intervals individual students are actually engaged during all of the intervals in which subject matter motor context categories are recorded). But, ALT-PE is still the primary datum yielded by the system -- and, a strong case has been made here and elsewhere that it is a powerful variable both as an index of relative teacher effectiveness and as a means for diagnosing and prescribing strategies for teachers inservice and teachers in training. For these reasons, it is understandable that at certain times supervisors and researchers might want to produce data on ALT-PE without the other information yielded by use of the entire system.

There are three ways in which ALT-PE data can be generated. First, interval recording could be used in which the decision for each interval was yes or no depending on whether the student observed was or was not engaged in subject matter motor content at an appropriate difficulty level for

his/her abilities. Very short intervals could be used here because of the simplicity of the decision system.

A second way to collect ALT-PE data would be to do group time sampling periodically. A typical group time sample scan procedure could be used, but the observer would merely count the number of students engaged in subject matter motor content at an appropriate difficulty level. This procedure, like the interval example above, could be done quite often. With a yes/no decision system, the scan should not take more than 15 seconds for a typical physical education class. A group time sample every two minutes would yield 20 samples of the entire class in a 40 minute lesson — a very firm and representative figure.

A third way to collect ALT-PE data would be to monitor a single student continuously using duration recording. A stopwatch or chronograph could be started whenever the target student was engaged in subject matter motor content at an appropriate level of difficulty and stopped when such engagement ceased. The cumulative time would represent the truest representation of ALT-PE.

A fourth way to gather information that is highly analagous to ALT-PE data would be to count the number of trials (at an appropriate difficulty level) that a student gets in a lesson. These data could be expressed in trials per minute or trials per 30 minutes and would yield very interesting information that is very similar to that produced through the ALT-PE system. In activities where discrete trials (such as in archery, bowling, or golf) are easily observed, this approach is quite useful. In activities where discrete trials are harder to detect, (as in dribbling a soccer ball, running for distance, or playing defense in basketball), the other approaches would yield more reliable data.

Reliability for ALT-PE

Whether for supervision or research purposes, ALT-PE users should ensure that the data they are collecting are reliable. Reliability is the first requisite for good data — if data are unreliable, they simply are of no value.

There are as many meanings of reliability as there are calculation techniques. For a general discussion of reliability issues the reader is directed to Siedentop and Olson's (1978) discussion.

Reliability here is taken to mean the degree to which independent observers, utilizing the same definitions and observing the same subjects, agree on what they have observed. What is important for ALT-PE is the reliability of the observers, the degree to which the data produced by observers is accurate and believable.

Data which have been shown to be reliable, according to the definition utilized herein, can be used for descriptive purposes or to assess the believability or validity of an experimental effect.

Persons learning to code the ALT-PE system should establish reliability prior to the time they will code for supervision or research purposes (see the section on "Learning the ALT-PE System"). When the ALT-PE system is used for research purposes, reliability should be checked occasionally to ensure that coders are not "drifting" from the original definitions. A reliability check refers to an observation session when two observers code independently and then compare their results. Independent coding means that the observations of one person do not influence the observations of the other person. This necessity for independent coding can usually be accomplished by

having the two coders sit or stand at least 10-12 feet apart. If a tape recorder and preprogrammed cassette are being utilized to cue observers, reliability checks will require that a spliced ear jack be available so that each observer hears exactly the same cues at the same time.

Calculating reliability

The general method for calculating the degree of agreement between two independent observers is:

$$\frac{\text{Agreements}}{\text{Agreements \& Disagreements}} \quad X \ 100 = \% \text{ of agreement}$$

An agreement is a sample in which both observers recorded the same code. A disagreement sample occurs when observers record different codes. Although this general formula can be utilized for data collected through interval, duration, group time sample, and frequency recording, the resulting percentage of agreement means something different with each observation technique. With interval recording, the reliability calculation allows for comparison of each separate observation sample, on an interval by interval basis. For the other recording techniques, the reliability calculation allows for an overall comparison between the totals of the two independent observers, but not for an observation by observation comparison. Thus, the interval reliability figure is considerably more rigorous than those for duration, group time sampling, or frequency counting. These latter techniques provide an estimate of agreement on the overall amount of behavior recorded during an observation session. The interval technique, however, allows for a sample by sample comparison.

The preferred method for calculating reliability of data collected through interval recording procedures is referred to as the Scored-Interval method (Hawkins & Dotson, 1975). The Scored-Interval (S-I) method allows for the rigorous assessment of reliability by category. Obviously, observers

might be highly reliable in observing one category (those in the general content categories for example) and less reliable in assessing other categories (the motor engaged categories at the learner involvement level for example). A good rule of thumb to follow is that reliability should be assessed for the variables that are included in the data presentation. That is, if data are to be shown be category, then reliability by category should be established. If data are to be shown at the General Content, Subject Matter Knowledge, and Subject Matter Motor levels only, then reliability should be shown at that level. The S-I method is completed as follows.

1. Identify the level at which reliability should be established — i.e., category level, subdivision level, etc.
2. Identify those intervals in which at least one of the observers recorded the presence of the target variable (these are the scored intervals).
3. Ignore those intervals where neither observer recorded the presence of the variable (these are unscored intervals).
4. Compare the scored intervals on an interval by interval basis to determine the number of intervals in which the independent observers agreed and disagreed.
5. Having counted the agreements and disagreements in the scored intervals, put those numbers into the reliability formula and calculate the S-I percentage figure for that variable.
6. Repeat this process for each variable that will be shown in the final data set. The S-I technique is a stringent test of observer reliability. Percentages higher than 75% should be considered as excellent. The S-I technique is limited when the number of intervals is quite small. Our strategy has been not to calculate reliability when the number of comparisons is fewer than 10 intervals.

The method for calculating reliability for duration and frequency counts is straight forward. The independent observers record their data for the entire observation session. Their totals (either in total duration or total number of frequencies) are then utilized to calculate reliability. The procedure is as follows.

1. Identify the level at which reliability should be established.
2. Identify the total figures for that variable for the observation session.
3. Calculate reliability by dividing the data of the observer who has the lower number of instances or time by that of the observer who has the higher number of instances or time in the following formula.

$$\frac{\text{Lower number}}{\text{Higher number}} \quad X \quad 100 \quad = \% \text{ of reliability}$$

4. Repeat this procedure for each variable that will be shown in the final data set.

Reliability for Group Time Sampling (GTS) is done on a sample by sample comparison. Estimates made by independent observers for each GTS are compared. The procedure is as follows.

1. Identify the level at which reliability should be established.
2. Identify the total figures for that variable for <u>each</u> GTS.
3. Calculate reliability by dividing the data of the observer who has the lower number of instances by that of the observer who has the higher number of instances in the following formula.

$$\frac{\text{Lower number}}{\text{Higher number}} \quad X \quad 100 \quad - \% \text{ of reliability}$$

4. Add the % figures for each GTS and divide by the total number of GTS's for that session to achieve a GTS reliability figure for that variable

within that session.

5. Repeat procedure for each variable that will be shown in the final data set.

Learning the ALT-PE system

Academic Learning Time - Physical Education (ALT-PE) is a multi-faceted system of 21 categories. The categories are divided among two levels. Level 1 categories focus on the group context within which learners are behaving. Level 2 categories focus on the nature of the involvement of the individual learner within the context described in Level 1. The purpose of the system is to describe reliably and validly the degree to which time in a physical education lesson is utilized in a manner conducive to improvements in student performance.

Category systems require that observers be able to discriminate among a group of related behaviors. The category chosen by an observer to represent the behavior of a group or an individual student is transferred to a coding sheet. The reliability of a system is determined by the degree to which independent observers discriminate and transfer identical choices for a given observation sample. Thus, it is of utmost importance that observers be trained to interpret the system in the same way. This, in turn, requires learning a common set of concepts, a common symbol language, and a common set of decision conventions.

The sequence of tasks described in this section have been found to be successful in training observers to produce reliable data; i.e., data that reach a minimum of 80% agreement (see section on reliability on page 32). Some of the tasks may be done alone. The later tasks require the use of a second observer. Reliability of observers should be established prior to the beginning of a research study and checked periodically thereafter. For supervision purposes, reliability is equally important -- feedback to interns should be based on information that reflects faithfully and accurately what

happened in classes taught by the intern.

The training tasks are sequential. Mastery at one level should be achieved before moving on to the next task. Special video tapes are usually not necessary for coder training. Most video tapes of physical education teaching are sufficiently rich that coders can be trained with them. Naturally, tapes developed specifically for ALT-PE training will enhance the acquisition of reliable observation skills.

Task 1: Learning the definitions and symbol system.

Study the definitions found in pages 11-15. Study the symbols associated with each definition. While learning definitions we have found that a discussion experience typically enhances the procedure. You will have learned the definitions at an adequate level to proceed when you can place the appropriate symbol next to its definition with 100% accuracy. Correct answers are found on page 50.

Definitions	Symbols
1. The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.	_____
2. The student is appropriately involved in a primarily cognitive task such as listening to a teacher describe a game, listening to verbal instructions about how to organize, watching a demonstration, participating in a discussion, or watching a film.	_____
3. Time devoted to the practice of skills or chains of skills outside the applied context with the primary goal of skill development, such as a circle drill in passing a volleyball, exploration of movement forms, practicing the Schottische step, or practicing a particular skill on a balance beam.	_____
4. The student is appropriately engaged in carrying out an assigned non-subject matter task (a management task, a transition task, a warmup task) such as moving into squads, helping to place equipment, counting off, doing warmup exercises, or moving from the gym to a playing field.	_____

Definitions	Symbols
5. Time devoted to refinement and extension of skills in an applied setting (in a setting which is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants — such as, a half court five on five basketball activity, the practice of a complete free exercise routine, six against six volleyball (all with instructions, suggestions and feedback during the scrimmage).	_____
6. Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach--such as a volleyball game, a complete balance beam routine, the performance of a folk dance, or running a half-mile race.	_____
7. Time devoted to rest and/or discussion of nonsubject matter related issues such as getting a drink of water, talking about last night's ball game, telling jokes, celebrating the birthday of a class member, or discussing the results of a student election.	_____
8. The student is engaged in a subject matter oriented motor activity but the activity-task is either too difficult for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.	_____
9. The student is engaged in a noninstructional aspect of an ongoing activity such as retrieving balls, fixing equipment, retrieving arrows, or changing sides of a court in a tennis match.	_____
10. Time devoted to transmitting information concerning plans of action for performing either individually or as a group such as explanation of a zone defense, demonstration of an individual move, or discussion of how best to move the ball down a field.	_____
11. Student has completed a task and is awaiting the next instructions or opportunity to respond such as waiting in line for a turn, having arrived at an assigned space waiting for the next teacher direction, standing on a sideline waiting to get in a game, or having organized into the appropriate formation waiting for an activity to begin.	_____

Definitions	Symbols
12. Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.	_____
13. Time devoted to managerial and organizational activities related to instruction such as team selection, changing equipment, moving from one space to another, changing stations, teacher explanation of an organizational arrangement, and changing activities within a lesson.	_____
14. The student is engaged in subject matter motor activity the purpose of which is to assist others learn or perform the activity such as spotting in gymnastics, feeding balls to a hitter in a tennis lesson, throwing a volleyball to a partner who is practicing setup passing, or clapping a rhythm for a group of students who are practicing a movement pattern.	_____
15. The student is either not engaged in an activity he/she should be engaged in, or is engaged in activity other than the one he/she should be engaged in — behavior disruptions, misbehavior, and general off-task behavior, such as talking when a teacher is explaining a skill, misusing equipment, fooling around, fighting, disrupting a drill through inappropriate behavior.	_____
16. Time devoted to class business that is unrelated to instructional activity such as taking attendance, discussing a field trip, lecturing about appropriate behavior in the gymnasium, and collecting money for the yearbook.	_____
17. Time devoted to transmitting information about regulations which govern activity related to the subject matter such as explanation of the rules of a game, demonstration of a specific rule violation, or viewing a film depicting the rules of volleyball (time devoted to transmitting information about rules governing general student behavior in physical education are coded management).	_____
18. Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity such as explanation of what constitutes sportsmanship in soccer, discussion of the ethics of reporting one's own violations in a game, or explanation of proper ways to respond to officials in a game.	_____

Definitions	Symbols
19. Time devoted to routine execution of physical activities whose purpose is to prepare the individual for engaging in further activity, but not designed to alter the state of the individual on a long term basis, such as a period of light exercises to begin a class, stretching exercises prior to a lesson, or a cooling down activity to terminate a lesson.	_____
20. Time devoted to activities whose major purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility such as aerobic dance, distance running, weight lifting, or agility training (the activities should be of sufficient intensity, frequency, and duration so as to alter the state of the individual).	_____
21. Time devoted to transmitting information concerning the physical form (topography) of a motor skill such as listening to a lecture, watching a demonstration, or watching a film.	_____

Task 2: Assigning behavioral descriptions to the appropriate category.

The following behavioral vignettes describe what the group is doing (context level) and what a hypothetical individual student is doing (learner involvement level). The task here is to assign the behaviors in the vignette to the appropriate context and learner involvement categories, utilizing the symbol system. For each behavior vignette, the top line should be used for the context level symbol and the bottom line for the learner involvement symbol.

You will have demonstrated sufficient skill to move to the next step when you can identify 90% of the examples correctly. Correct answers can be found on page 50. Incorrect identifications should be noted because they provide evidence as to which part of the system has not been discriminated properly. Typically, there is lack of discrimination among two specific categories. If so, study these category definitions again and discuss them with a colleague to check your understanding.

Behavior Description	Symbols
1. Students are moving from one gymnastics station to another. Target student is among those moving.	_____ _____
2. Teacher is lecturing to the class about sportsmanship. Target student is talking to her neighbor and pointing to the door of the gym.	_____ _____
3. The class is doing aerobic dancing (and has been for 10 minutes). The target student is doing it with no apparent problem.	_____ _____
4. The class is numbering off for teams. The target student has just called his number and is watching his classmates call theirs.	_____ _____
5. The class is playing a soccer game. The target student is standing on the sideline waiting to get into the game.	_____ _____
6. The class is doing tumbling skills. The target student is spotting for a classmate.	_____ _____
7. The class is spread out around the gym at the start of class. The teacher is talking to a student who just entered. The target student is sitting on the bleachers talking to a classmate.	_____ _____
8. The class is in a movement lesson using balls. The target student is shooting baskets with her ball.	_____ _____
9. The class is involved in several basketball games. The target student is in a game, but doesn't have good enough skills to participate fully.	_____ _____
10. The class is working on a movement problem involving balancing on three body parts. The target student is balancing on one leg and one arm.	_____ _____
11. The teacher is explaining net violations in volleyball. The target student is listening to the explanation.	_____ _____
12. The teacher is discussing the upcoming tournament game with the class. The target student is involved in the discussion.	_____ _____
13. The class is stretching prior to the beginning of a modern dance lesson. The target student is doing a hamstring stretch.	_____ _____
14. The entire class is doing a folk dance, the Hora, to a record. The dance is done in its entirety. The target student appears to be doing it correctly.	_____ _____

15. The class is in a gymnastics lesson. The target student is trying to do a cartwheel, but after several attempts still cannot get his feet anywhere near over his hands. _____ _____

16. The class is doing a soccer dribbling drill inside the gym. Six students are in each line. The target student is next to the last in her line, watching a classmate dribble. _____ _____

17. After a strenuous activity, the class is told to "take five" for water. The target student is walking away from the water fountain talking to a classmate. _____ _____

18. The class is in a folk dance lesson. The teacher is helping them to put together several steps to form the entire dance. The music is stopped frequently for comments from the teacher. The target student appears not to be able to link the steps together successfully. _____ _____

19. The class is involved in serving drills in a volleyball unit. The target student is retrieving balls. _____ _____

20. The class is in a basketball unit and, at the moment, is practicing free throws. The target student is shooting free throws and appears to be able to make approximately 3-10. _____ _____

21. The teacher is demonstrating the drive in a field hockey lesson. The target student is watching the demonstration. _____ _____

22. The class is watching a film on the history of cross country skiing prior to beginning a unit on that sport. The target student appears to be watching the film. _____ _____

23. The class is involved in a strength development unit. The target student is standing next to one station at a universal gym while a classmate does leg curls at that station. _____ _____

24. The class is involved in a tumbling unit. The class is now spread out working on skills. The target student is reading a task card posted on the gymnasium wall. _____ _____

25. The class is in a jump rope unit, working at the moment on double dutch. The target student is turning ropes. _____ _____

26. The class has just left the gymnasium to go to the playground to organize a soccer game. The target student and friend have paused momentarily to climb on the jungle gym. _____ _____

27. The class has now arrived at the playground space for the soccer game, but the teacher has not yet arrived. The target student has arrived at the space and is standing talking to a classmate. _____ _____

28. The class is involved in a softball unit, currently hitting balls off a tee. The target student is one of those spread out to field balls. At the moment of observation, no ball comes to the target student. _____ _____

29. The class is doing a three minute series of exercises that they do prior to each lesson. The target student is in the pushup position, but instead of doing a full pushup merely "goes through the motions". _____ _____

Task 3: Utilizing the coding sheet properly.

Having learned the definitions and symbols, and also having learned to accurately classify written behavioral vignettes, the next step is to use the ALT-PE coding sheet properly. This task is straightforward. It consists simply of entering the proper symbol in the appropriate interval box.

On the coding sheet shown on page 46 enter the following observations for three hypothetical target students. Remember that the coding strategy is to alternate observations of individual target students -- the first interval for S-1, the second interval for S-2, the third interval for S-3, the fourth interval for S-1, and so on. This task should be done with 100% accuracy. The appropriate coding entries are shown on page 51.

The data shown below are already translated into the symbol system for ALT-PE. The task is to transfer those symbols to their appropriate places on the coding sheet. The data are shown as they would be collected, on an interval by interval basis. Each observation has two symbols. The symbols in the first column are context symbols. The symbols in the second column represent observations concerning learner involvement for that interval.

M	ON	P	MI	G	MA	G	MI	P	MA
M	ON	P	MI	G	W	G	W	P	MA
M	C	P	MA	G	MI	T	ON	T	C
T	ON	P	I	G	MA	T	ON	T	C
T	ON	T	ON	T	C	T	ON	T	ON
T	W	T	ON	T	C	T	W	T	ON
T	W	G	W	T	C	P	W	M	ON
T	W	G	W	T	ON	P	MA	M	C
T	W	G	MA	T	ON	P	MA	M	C
P	W	G	MA	T	W	P	MI	M	C
P	W	G	MI	G	W	P	MI	M	C
P	MA	G	W	G	W	P	I	M	OF
T	ON	G	MA	G	MA	P	OF	M	OF

There are five double colums of data. Start coding with the top of the first double column and move through to the bottom of the fifth double column.

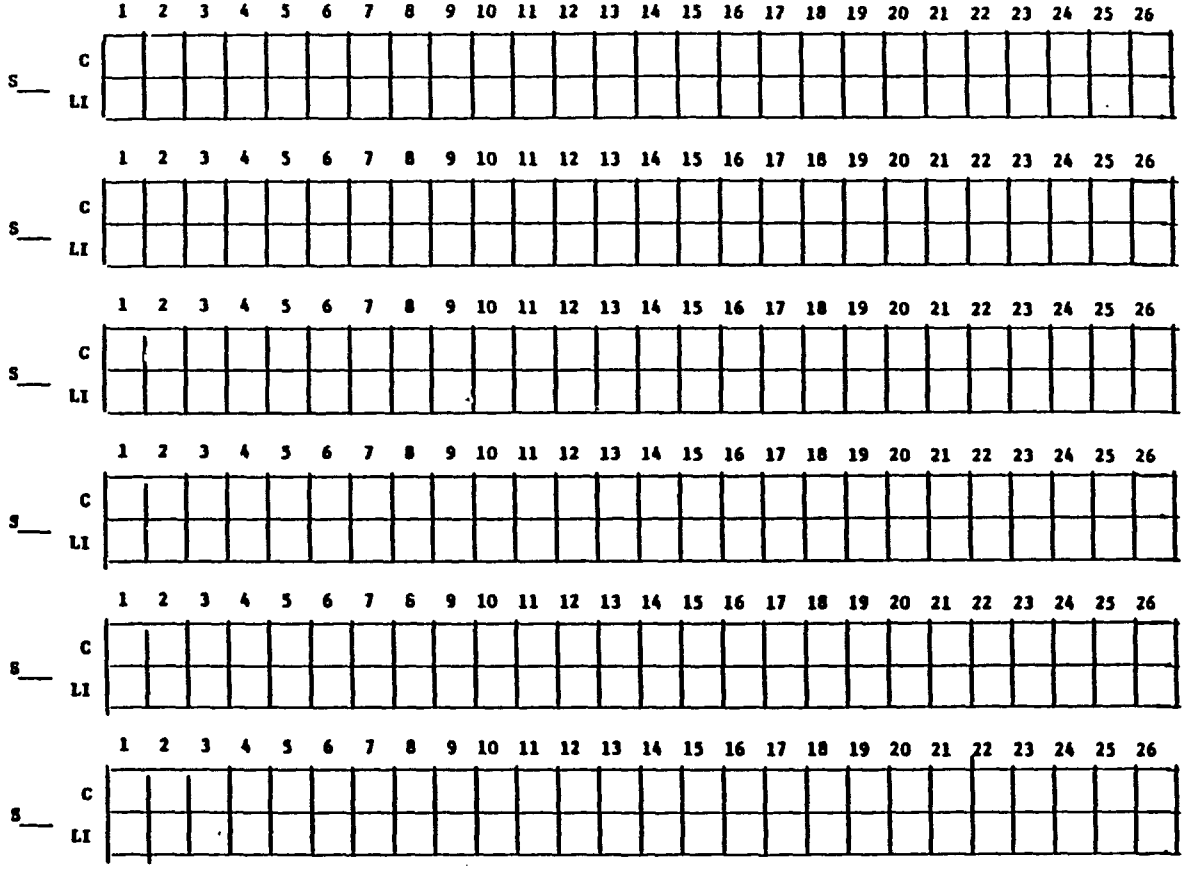
Task 4: Beginning video tape analysis.

This task requires the use of a video tape of students in a physical education or athletic setting. This task is to be completed with a partner. Preferably, the partner has already learned the ALT-PE system and, thus, can provide accuracy checks. However, this task can also be useful for two persons who are learning the ALT-PE system together.

One student should be selected (from those easily seen on the video tape) as a target subject. One partner should provide "observe", "record" cues to the other partner (or this could be done from a preprogrammed cassette tape). During the "record" phase, the second partner verbally describes the context and the learner involvement. If there is agreement, the first partner provides another "observe", "record" set of cues. If there is disagreement, the tape should be stopped immediately and the decisions discussed until agreement is achieved. It is often helpful to reverse the tape and view again the portion of the tape in which the disagreement occurred.

Partners can reverse roles periodically. This task is an important step in reconciling differences in understanding of the definitions. Key judgments made during this task should be written down so that they might later be

ALT-PE CODING SHEET



Context Level			Learner Involvement Level	
General Content	SM Knowledge	SM Motor	Not Motor Engaged	Motor Engaged
Tran ition (T)	Technique (TN)	Skill Practice (P)	Interim (I)	Motor appropriate (Ma)
Mana ement (M)	Strategy (ST)	Scrimmage/Routine (S)	Waiting (W)	Motor inappropriate (Mi)
Brea (B)	Rules (R)	Game (G)	Off-task (Of)	Supporting (Ms)
Warm Up (WU)	Social Behavior (SB)	Fitness (F)	On-task (On)	
	Background (BK)		Cognitive (C)	

included in a "decision log". A decision log is simply a record of specific situations and the manner in which they should be interpreted.

Task 5: Intermediate video tape analysis.

This task requires a short video tape of a physical education class or an athletic team. It also requires a preprogrammed cassette tape with observe-record cues (at the outset it is advisable to have a 10 second observe, 20 second record series in order to allow the observers a sufficient length of time for decision making). Two or more persons can view the tape concurrently, hearing the same observe-record cues.

The tape should first be viewed using only the context categories from the ALT-PE system. This means that only one decision is required for each interval. The entire tape should be viewed (a 7-10 minute tape is most advisable for this task) and each observer should record a context symbol for each interval. Results should be compared on an interval by interval basis and used for discussion purposes where disagreements occur. If necessary, the tape can be replayed so that specific instances of diagreement can be pinpointed.

The tape should then be viewed again with one student selected as a target subject. This time only learner involvement symbols should be used. Comparison of results, discussion, and replay should again follow. Observers should achieve 80% agreement at this task before moving on.

Task 6: Advanced video tape analysis.

A 20 minute video tape is required for this task. The tape should have 2 students clearly in view throughout the tape. This task is to be completed with 2 or more observers. A preprogrammed cassette tape should provide observe-record cues. A 10 second observe, 15 second record interval should be used at the outset. An ALT-PE interval recording coding sheet should be utilized to record the data.

Select 2 students from the tape. Make sure that each observer understands which student is S-1 and which is S-2. S-1 is observed for the first interval, S-2 for the second, S-4 for the third and so on.

View the entire tape. Calculate reliability using the Scored Interval technique (see section on Reliability). Discuss any difficulties that arose. A 75% reliability should be achieved, at least for categories that had more than 10 scores.

This task should then be repeated with an 8 second observe, 10 second record format. Again, 75% reliability should be a criterion for moving on to another task.

This task should then be repeated with a 6 second observe, 10 second record format. This format approximates the format used by trained observers.

Task 7: Coding on-site.

This task requires that observers code "live". This can be done in a college physical education class, in a public school physical education class, or in virtually any setting where motor skill instruction is taking place. Observers should use a preprogrammed cassette tape (starting with a 10 second observe, 15 second record format). Ear jacks should be spliced so that the observers can each hear the observe-record cues and still be positioned so that a minimum of 10' of space is between them, thus preventing tendencies to collaborate.

A single target subject should be picked out prior to the coding. This subject should be wearing clothes that make him/her easy to spot. The observers should then proceed to code 10 minutes of the session. They then should stop and calculate their reliability and discuss any major problems that have arisen. They then should return to their coding for the remainder of the session. 80% reliability should be achieved at this task.

The task should be repeated several times with the following changes.

1. Gradually reduce the observe-record time format until it reaches a 6 second observe, 8 second record format.
2. Choose 2 target students and alternate intervals.
3. Choose 3 target students and alternate intervals.

This task represents the final training task for ALT-PE. When observers can consistently achieve a 75% reliability (using the Scored-Interval technique) they can then collect data. Reliability should, however, be checked periodically to ensure that coders have not "drifted" from original definitions.

Training Task # 1: Answers

1. Ma
2. C
3. P
4. On
5. S
6. G
7. B
8. Mi
9. I
10. St
11. W
12. Bk
13. T
14. Ms
15. Of
16. M
17. R
18. Sb
19. Wu
20. F
21. Tn

Training Task # 2: Answers

1. T
   On
2. Sb
   Of
3. F
   Ma
4. T
   On
5. G
   W
6. P
   Ms
7. M
   W
8. P
   Of
9. G
   Mi
10. P
    Mi
11. R
    C
12. B
    On
13. Wu
    On
14. G
    Ma
15. P
    Mi
16. P
    W
17. B
    On
18. S
    Mi
19. P
    I
20. P
    Mi
21. Tn
    C
22. Bk
    C
23. F
    W
24. P
    C
25. P
    Ms
26. T
    Of
27. T
    W
28. P
    Ma
29. Wu
    Of

ALT-PE CODING SHEET

S		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	C	M	T	T	P	T	P	T	G	G	G	T	T	G	G	T	P	P	P	T	T	M	M				
	LI	On	On	W	W	On	Ma	On	Ma	W	W	C	On	W	Mi	On	W	Mi	Of	C	On	C	Of				
2	C	M	T	T	P	P	P	G	G	G	G	T	T	G	G	T	P	P	P	T	M	M	M				
	LI	On	On	W	W	Mi	I	W	Ma	Ma	Mi	C	On	W	W	On	Ma	Mi	Ma	C	On	C	Of				
3	C	M	T	T	P	P	T	G	G	G	G	T	T	G	T	T	P	P	P	T	M	M					
	LI	C	W	W	Ma	Mi	On	W	Mi	Ma	Ma	C	W	Ma	On	W	Ma	I	Ma	On	C	C					
	C																										
	LI																										
	C																										
	LI																										
	C																										
	LI																										

Context Level

General Content	SM Knowledge	SM Motor
Transition (T)	Technique (TN)	Skill Practice (P)
Management (M)	Strategy (ST)	Scrimmage/Routine (S)
Break (B)	Rules (R)	Game (G)
Warm Up (WU)	Social Behavior (SB)	Fitness (F)
	Background (BK)	

Learner Involvement Level

Not Motor Engaged	Motor Engaged
Interim (I)	Motor appropriate (Ma)
Waiting (W)	Motor inappropriate (Mi)
Off-task (Of)	Supporting (Ma)
On-task (On)	
Cognitive (C)	

Coding Conventions for ALT-PE

No set of definitions can be expected to cover all of the possible situations that might arise in an observation session. Likewise, regardless of how many examples are provided, there will always be new situations that require interpretation and, subsequently, categorization into the system. The best way to handle these situations is to build a decision log, which is simply a record of instances where decisions were difficult and the decision made about how to handle similar instances in the future. These "decisions" become coding conventions that can be used in training observers. For example, some of the predictable situations for ALT-PE are discussed below and the appropriate coding conventions cited.

1. Confusion often exists about how to code instances where teachers focus on social behavior. When social behavior is related to the subject matter, as in sportsmanship lectures, it is coded Sb. When appropriate ways of behaving in the gymnasium are the target (such as paying attention to the teacher when the whistle blows) Code M. The distinction here is between substantive social behavior and nonsubstantive social behavior.
2. How does one distinguish between transition and management? The decision here again hinges on whether the focus is substantive or nonsubstantive; i.e., related to instructional goals or unrelated to instructional goals. Moving equipment into place is therefore a transition (substantive) while collecting money for the yearbook is management (nonsubstantive).
3. How does one distinguish between warm up and fitness. At first, this decision may be difficult, but as an observer gains experience in the setting, it becomes much easier. To be recorded as fitness, the activity

would have to be of sufficient intensity to contribute to changes in the students. The opening exercise period is seldom of sufficient intensity to be coded as fitness.

4. How does one judge success rate? There are no simple rules for this decision. The observer is asked to judge whether the student's skills match the task situation into which he/she has been put. Success criteria differ for each student, because their skill levels differ. The real question is "does the student have sufficient entry skills to be successful in this activity"? In practice contexts, this can often be judged by counting successful trials. In scrimmage and game contexts, the decision needs to be made by judging how well the student appears to be able to fit into the demands of the scrimmage and/or game context. If a 6th grader has to "shoot from the hip" to get enough strength to get the ball up to a 10' high basket, this should be coded motor inappropriate. Modified games often help match the demands of game tasks to student abilities. In regulation games, many students often do not have sufficient skills to play at an appropriate success level.
5. How does one code testing/evaluation sessions? The coding convention here is to code it in terms of its substantive focus; i.e., written tests as cognitive involvement (with rules often the context) and motor skill tests as practice (unless the test is a "game type" test). The coder should then indicate either on the coding sheet itself or on the "comments" section on the reverse side of the coding sheet that certain intervals were evaluation intervals. These and other coding conventions can be adopted and gradually incorporated into the system. Coding conventions should be stated clearly whenever they are developed. This

improves the reliability of the data and also allows other consumers of the data to note differences in coding conventions among data collected in different programs.

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APPENDIX D

Decision Log

(Record of difficult decisions)

Date:	Situation:	Coding Convention Used:

APPENDIX E

INTRODUCTION

The major objective of this project is to assist you in changing certain behaviors and/or classroom conditions so that your students will have a better chance to increase their Academic Learning Time.

Academic Learning Time, or ALT is simply the time that a student spends making a motor response relevant to the instruction in physical education at an appropriate level of difficulty. Evidence exists from previous research studies which leads us to believe that ALT engagement is related to achievement in physical education. Therefore, if we can provide more ALT in our physical education classes, students ought to become more skilled in our subject matter.

DATA COLLECTION AND INSTRUMENT

As you are aware, we have been collecting data on three students in your class. The data we have collected on the three students allows us to get a picture of the ALT in your classroom.

On page 3 you will find a sample of the ALT-PE Coding Sheet. The Coding Sheet allows us to gain information about the Context Level and the Learner Involvement Level in a class setting. Context Level, whether General Content, Subject Matter Knowledge, or Subject Matter Motor tells us what the class as a whole is doing. Learner Involvement Level tells us what the individual student is doing. For example, if a student is "Not Motor Engaged", we can discern whether it is due to waiting, off-task behavior, or other reason. If the student is "Motor Engaged", we can determine if it is of an appropriate level of difficulty.

INTERVENTION

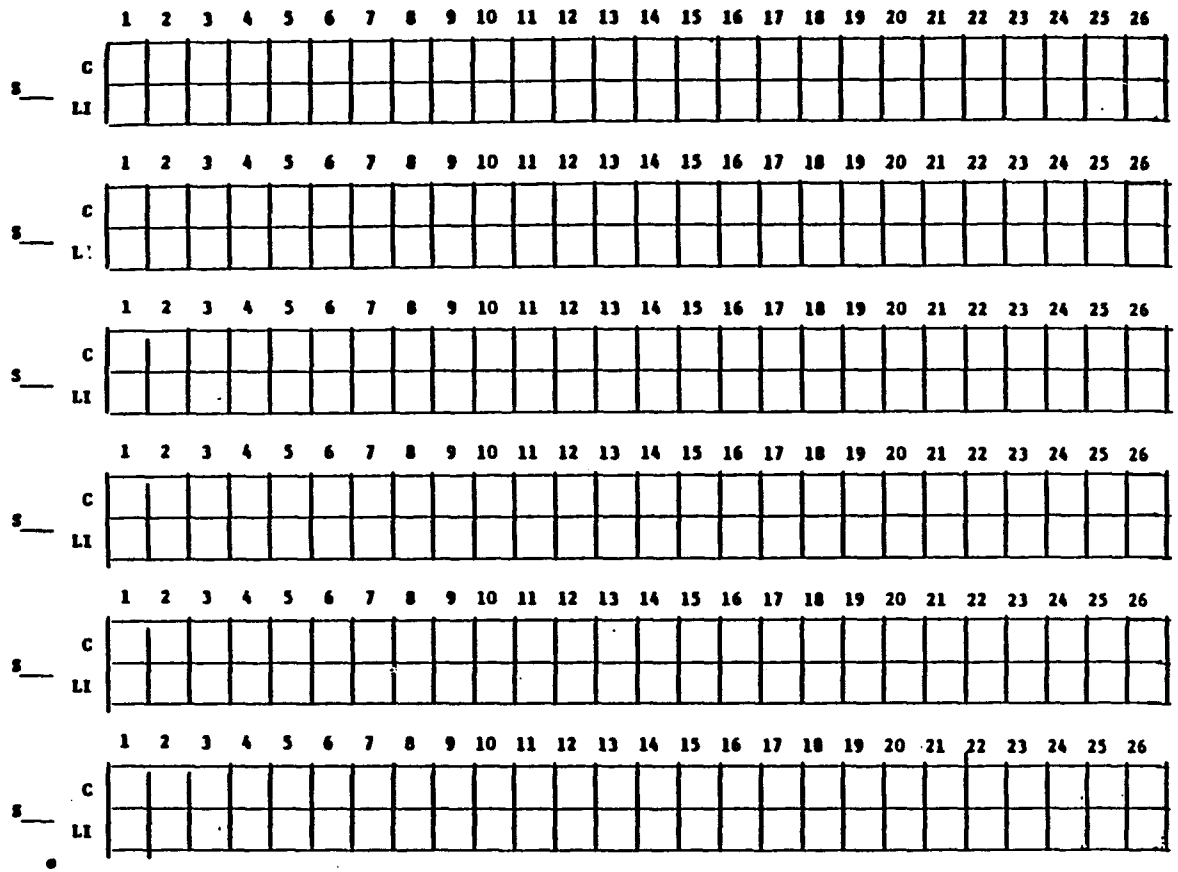
The procedures we will use to change behaviors and/or classroom conditions are simple. We will examine one behavior and/or classroom condition at a time and attempt to make a positive change which will hopefully result in an increase in student ALT. Suggestions for change will be made at the beginning of each intervention. If necessary, I will assist you in preparing any materials. We will focus on three different behaviors during the course of the study, and will deal with each one at a time.

You will be asked to graph the changes based on data that follows each observation. Each evening after observation, I will telephone you with the data you are to plot. This repetitive feedback and graphing should help us in charting our progress. It will also give us an opportunity to discuss that days class.

Each time a new behavior is targeted for change, we will examine the existing conditions and discuss specific ways to implement the desired change. You will then begin to graph that behavior or condition as well as the one(s) already being graphed.

Graph paper has been included in this notebook, and I have graphed your baseline data points for you. This baseline represents data gathered from observations prior to intervention.

ALT-PE CODING SHEET



Context Level

General Content	SM Knowledge	SM Motor
Transition (T)	Technique (TN)	Skill Practice (P)
Management (M)	Strategy (ST)	Scrimmage/Routine (S)
Break (B)	Rules (R)	Game (G)
Warm Up (WU)	Social Behavior (SB)	Fitness (F)
	Background (BK)	

Learner Involvement Level

Not Motor Engaged	Motor Engaged
Interim (I)	Motor appropriate (Ma)
Waiting (W)	Motor inappropriate (Mi)
Off-task (Of)	Supporting (Ms)
On-task (On)	
Cognitive (C)	

SCHOOL AND TEACHER _____

GRADE AND NUMBER OF STUDENTS_____

CHANGE NUMBER _____

BEHAVIOR/CONDITIONS TARGETED FOR CHANGE _____

_____

SUGGESTIONS FOR CHANGE

_____

_____

_____

_____

_____

_____

_____

_____

ADDITIONAL NOTES

APPENDIX F

April 20, 1982

San Jose Elementary School
1665 San Roy Dr.
Dunedin, FL 33528
ATTN: Kathy Collins - Physical Education

Dear Kathy;

I would like to take this opportunity to thank you for participating in my ALT-PE research project. Your time and effort is indicative of the type of professionalism that is needed in the area of Physical Education today.

For your information, the collection of data at each of the four participating schools has been completed. The ALT-PE dissertation which is based on this research will be completed later this year. I will be contacting George Jones, Pinellas County Supervisor for Physical Education, in the immediate future to arrange for the Component Points earned as part of your participation in the study.

I am looking forward to receiving the following at the earliest opportunity:

1. Daily Log - expressing concerns, objectives, and/or priorities of the lessons to further clarify our statistical data.
2. Graphs - given to you during the study, and
3. General Statement - briefly summarizing your feelings regarding ALT-PE and its place in everyday teaching.

Please do not hesitate to contact me if there are any questions.

In closing, let me again thank you for all your help and cooperation. I feel confident that your contribution will have significant impact on our better understanding ALT-PE and its relationship to skill development at the elementary school level.

Sincerely;

Claire L. Hart

Claire L. Hart
San Jose Elementary School

cc: George Jones
Robert Reid

APPENDIX G

Table 21

Observation Analysis for School 1.

ACTIVITY:	-BOWLING	-2 DANCES	-FOLK DANCE	LONG JUMP-METRICS & GAME	50yd. DASH RELAY-METRICS	50yd. DASH RELAY-METRICS	BALANCE SKILLS & DODGE GAME	BALANCE SKILLS & BK TO BK. GAME	TENNIS BALLS & PADDLES-& GAME	THROWING SKILLS & GAME	LUMMI STICKS & CROSS MOTOR MOVE.	LUMMI STICKS	TOSSING, BOUNCING & CATCHING SM. BALLS	PARACHUTE & STATIC BALANCE	CROSS MOTOR MOVE. TO MUSIC & HOPES	STUNTS WITH PARTNERS	-BALL DRIBBLING	COMBATIVE STUNTS & GAME	BOWLING & GAME	-BALL DRIBBLING	-GYMNASTICS & GAME	CATCHING & THROWING BK TO BK. GAME	BOWLING & BALANCE BEAM BAGS	KICKING TO TARGET & JUMP ROPE W/PARTNERS	
DATA POINTS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
GENERAL CONTENT:	37	42	50	46	43	46	30	16	38	33	32	28	9	27	22	11	19	20	23	17	13	19	10	10	
(T)	36	42	40	44	38	43	30	16	33	29	26	24	7	16	20	10	13	20	15	13	11	14	10	10	
(M)	1	1	10	.2	4	3	-	-	4	4	6	4	2	10	-	1	6	-	8	4	1	5	-	-	
(B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	
(W)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SUBJECT MATTER KNOWLEDGE:	13	10	10	18	25	21	11	18	22	25	17	20	19	15	13	18	22	12	5	8	12	12	9	18	
(TN)	10	9	3	10	10	15	9	11	8	7	10	9	10	8	8	12	9	12	1	4	8	8	9	9	
(ST)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
(R)	-	1	3	-	12	1	2	5	12	6	3	1	-	2	-	-	-	5	3	4	-	4	-	9	
(SB)	3	-	3	5	3	4	-	2	3	7	5	10	7	5	5	6	8	-	-	-	3	-	-	-	
(BK)	-	-	-	3	-	-	-	-	-	5	-	1	1	-	-	-	6	-	1	-	1	-	-	-	
SUBJECT MATTER MOTOR:	49	45	40	36	31	33	58	66	40	42	51	52	72	58	65	71	58	63	72	75	74	68	82	72	
(P)	49	45	23	16	31	33	29	23	26	24	40	32	72	49	60	71	58	25	44	75	37	42	82	72	
(S)	-	-	13	-	-	-	-	-	-	-	11	20	-	-	-	-	-	-	-	-	30	-	-	-	
(G)	-	-	-	19	-	-	29	43	14	-	-	-	-	9	-	-	-	38	28	-	6	26	-	-	
(F)	-	-	4	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	
NOT MOTOR ENGAGED:	73	73	70	77	91	90	77	34	73	78	65	61	51	47	43	50	61	48	47	32	32	44	29	39	
S-1	71	71	77	77	91	94	65	ab	81	79	71	57	61	45	55	49	70	36	54	28	30	48	39	35	
S-2	77	81	63	ab	ab	ab	88	36	69	88	66	63	59	54	34	54	57	45	35	36	38	50	26	42	
S-3	ab	66	ab	76	91	86	77	32	23	68	59	63	31	41	38	54	55	55	54	32	28	34	22	42	
(I)	7	-	-	6	1	3	3	-	12	11	1	9	8	-	-	-	1	-	1	1	2	3	6	5	
(W)	48	46	42	38	32	44	47	7	28	24	19	29	6	16	22	2	20	11	21	9	5	16	4	4	
(OF)	-	3	-	-	4	5	3	-	2	3	-	4	9	3	8	14	9	3	6	3	3	4	4	5	
(ON)	5	9	15	16	21	18	13	9	12	17	15	6	7	12	5	3	5	17	12	8	9	7	7	7	
(C)	13	14	13	16	31	19	13	18	18	25	28	15	20	15	7	6	26	15	6	9	12	13	8	18	
MOTOR ENGAGED:	26	26	30	23	9	9	23	66	26	22	35	39	49	53	57	50	39	52	53	68	68	56	71	60	
S-1	29	31	27	23	9	5	34	ab	19	21	29	43	39	55	45	57	30	64	46	72	70	52	61	65	
S-2	23	17	36	ab	ab	ab	11	64	31	11	34	37	41	46	66	46	43	55	65	64	62	50	74	58	
S-3	ab	34	ab	23	9	14	23	68	27	32	40	37	69	59	62	46	45	36	46	68	72	66	77	58	
(MA)	8	25	28	23	9	8	20	65	26	22	33	36	37	53	57	50	39	52	52	68	65	53	50	46	
(MI)	1	1	2	-	-	1	3	1	-	-	2	3	2	-	-	-	-	-	1	-	3	3	1	1	
(MS)	17	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	20	13	
ALT - PE:	8	25	28	23	9	8	20	65	26	22	33	36	37	53	57	50	39	52	52	68	65	53	50	46	
S-1	6	28	23	23	9	3	34	ab	19	21	29	40	30	55	45	57	30	64	46	72	70	42	39	58	
S-2	10	16	33	ab	ab	ab	7	60	31	11	31	34	31	46	66	46	43	55	65	64	56	50	55	35	
S-3	ab	31	ab	23	9	14	19	68	26	32	37	34	50	59	62	46	45	36	42	68	69	66	55	46	

COMMENTS:

UNIT REQUIRED BY STATE AUDIT

1 AIDE QUIT TRAINING NEW AIDE DELAY--ST. SICK W/ CHICKEN POX

CLASS LATE COMING OUT

CLASS LATE

DISCIPLINE PROBLEM

STAY-IN-ASS

CLASS LATE

INJURED STUDENT

TWO ACTIVITIES FAR APART

Table 22

Observation Analysis for School 2.

ACTIVITY:	AEROBIC DANCE(1 of 3)	AEROBIC DANCE(2 of 3)	AEROBIC DANCE(3 of 3)	FOLK DANCE REVIEW(1 of 1)	LUMMI STICKS (1 of 4)	LUMMI STICKS (2 of 4)	LUMMI STICKS (3 of 4)	LUMMI STICKS (4 of 4)	HOOPS (1 of 3)	HOOPS (2 of 3)	HOOPS (3 of 3)	TUMBLING (2 of 3)	TUMBLING (3 of 3)	CHINESE JUMP ROPE(1 of 3)	CHINESE JUMP ROPE (2 of 3)	CHINESE JUMP ROPE (3 of 3)	INTRO TO COASTAL JOG(1 of 4)	FLA. COASTAL JOG (2 of 4)	FLA. COASTAL JOG (3 of 4)	FLA. COASTAL JOG (4 of 4)	INTRO TO FITNESS TEST & DODGE GAME	SCOOPS EXPLORATION (1 of 3)	SCOOPS OVER & UNDER THROWS(2 of 3)	SCOOPS THROWING & CATCHING(3 of 3)	BOWLING-3 pins (1 of 4)	BOWLING-6pins (2 of 4)	ROLLING PIN BOMBARDMENT(3 of 4)	ROLLING-PIN BOMBARDMENT(4 of 4)
DATA POINTS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
GENERAL CONTENT:	19	22	27	29	29	29	33	35	20	24	25	30	20	22	14	13	7	22	20	4	25	33	24	18	25	16	13	12
(T)	19	17	17	28	25	23	28	24	20	19	20	26	20	14	6	7	7	6	3	3	16	24	15	11	16	9	2	3
(M)	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-
(B)	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	16	15	-	-	-	-	-	-	-	-	-
(V)	-	-	6	-	4	6	5	11	-	5	5	4	-	8	7	6	-	-	2	1	3	9	9	7	9	7	11	9
SUBJECT MATTER KNOWLEDGE:	35	21	40	6	14	7	15	10	5	9	10	11	9	12	10	5	23	-	-	-	18	14	9	6	12	9	7	2
(TN)	15	21	40	7	8	3	15	8	2	6	6	11	9	8	10	5	19	-	-	-	16	13	7	6	12	9	7	1
(ST)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(R)	-	-	-	-	6	4	-	-	3	3	3	-	-	4	-	-	4	-	-	-	2	1	2	-	-	-	-	1
(SB)	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(BK)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBJECT MATTER MOTOR:	46	51	33	57	56	73	52	56	74	67	65	58	71	66	77	83	60	68	80	95	56	53	67	76	63	75	79	85
(P)	17	26	23	12	48	26	5	4	35	-	5	52	71	66	77	83	-	-	-	-	-	53	67	76	63	75	-	-
(S)	29	26	10	3	8	27	47	17	38	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(G)	-	-	-	42	-	-	-	35	-	67	-	-	-	-	-	-	-	-	-	-	56	-	-	-	-	-	79	85
(F)	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	70	78	80	95	-	-	-	-	-	-	-	-
NOT MOTOR ENGAGED:	62	49	68	39	62	50	55	65	43	33	36	76	61	33	23	14	30	22	20	5	44	40	67	41	73	60	21	21
S-1	71	54	65	32	69	50	ab	ab	53	35	37	63	50	35	26	17	22	18	16	7	45	46	31	53	75	67	27	16
S-2	65	46	69	45	62	52	62	61	ab	32	44	90	64	31	22	21	29	24	19	3	45	59	34	41	92	ab	18	33
S-3	53	49	69	59	54	49	49	69	30	32	27	83	68	35	22	17	29	26	25	3	41	54	34	29	66	52	22	13
(I)	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	3	-	5	5	-	-	6
(W)	17	17	19	19	16	12	16	13	6	4	9	51	30	8	4	5	2	5	2	2	11	13	10	11	38	40	1	1
(OF)	2	1	9	-	1	9	2	-	11	4	4	1	6	-	-	1	1	-	-	-	-	-	-	5	1	-	-	-
(ON)	8	18	18	23	32	20	22	52	16	14	15	12	15	14	10	8	4	17	18	2	14	21	14	13	17	11	12	11
(C)	35	13	32	6	12	10	19	-	7	11	9	11	9	12	10	5	23	-	-	-	18	14	9	7	13	9	7	2
MOTOR ENGAGED:	38	51	32	53	38	50	44	35	57	67	64	24	39	66	77	83	70	78	80	95	56	50	67	59	25	40	79	79
S-1	33	46	35	68	31	50	ab	ab	38	65	63	37	59	65	74	83	68	85	84	93	55	54	69	47	25	33	79	83
S-2	35	54	31	55	38	48	37	38	ab	68	55	20	36	69	78	79	71	76	81	97	55	50	66	59	18	ab	82	67
S-3	47	52	31	50	46	52	52	31	70	68	73	14	32	65	78	83	71	74	75	97	59	46	66	71	34	48	77	87
(MA)	38	51	32	53	38	50	44	35	44	56	64	22	39	66	17	22	70	78	80	95	56	40	67	59	25	40	79	79
(MI)	-	-	-	-	-	-	-	-	13	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(MS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59	60	-	-	-	-	-	-	-	-	-	-	-	-
ALT - PE:	38	51	32	53	38	50	44	35	44	67	64	21	39	66	17	22	70	78	80	95	56	50	67	59	25	40	79	79
S-1	33	46	35	68	31	50	ab	ab	30	65	63	37	50	65	15	31	68	85	84	93	55	54	69	47	25	33	79	83
S-2	35	54	31	55	38	48	37	38	ab	68	55	20	36	69	26	17	71	76	81	96	55	50	66	59	18	ab	82	67
S-3	47	51	31	53	46	52	52	31	63	68	73	7	32	65	33	17	71	74	75	95	59	46	66	71	34	48	77	87

COMMENTS:

- 19% of class time students observed others routine
- Discipline problem — Observer was late
- Groups of three — Tic, Tac, Doe--5 in a group-hold-ands w/ one jumping
- Intro & technique practice of course
- Game out & began jog immediately
- Long delay due to phys. fitness test.(between pts) — Groups of 4 at 3 pins
- Game using pins and balls

Table 23

Observation Analysis for School 3

ACTIVITY:	HOOPS-SPATIAL AWARENESS	STRIKING W/RACQUETS	FLUFF BALLS-THROWING & CATCHING & GAME	JUMP ROPE-LOCOMOTOR	BALANCING BEAM BAGS OVER & UNDER W/	STRETCH ROPES	LINECLIMBER, TIRES	BALANCE BEAM	ROPE CLIMB, HOOPS & HURDLES	LINECLIMBER & HURDLES	MAGIC CIRCLE & SCOOTERS	FRISBEES, OBSTACLE BOURSE & GAME	MOVEMENT PATTERNS, ROPE CLIMB & GAME	STRIKING W/ TEE & BALLS	PUSH BALL & FINGER SONGS	BALANCE BEAMS W/ HOOPS, BEAN BAGS & FRISBEES	OBSTACLE COURSE ROPE CLIMB, SCOOTERS & LINECLIMBER	KICKING SKILLS & JUMP ROPE	OBSTACLE COURSE & FRISBEES	BALANCE BEAM BAGS & SCOOPS-CATCH & THROW	THROWING AT TARGETS CATCHING & THROWING LOW ORGANIZED	GAME	BALL HANDLING SKILLS	ROPES, BEAN BAGS & BOWLING	BEAN BAGS & HOOPS	LUMMI STICKS & LOCOMOTOR SKILL W/MUSIC	SCOOTERS, BALLS & GAME	BALL HANDLING & 3 LEGGED MOVEMENT		
DATA POINTS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
GENERAL CONTENT: 28	23	25	30	23	11	23	22	16	28	17	11	13	14	14	15	16	13	17	13	4	6	5	3	9	12			
(T) 28	21	23	30	23	11	20	22	8	24	10	8	11	14	14	13	15	11	17	13	4	6	5	3	9	12			
(M) -	-	-	-	-	-	-	-	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
(B) -	2	2	-	-	-	3	-	-	2	6	3	2	-	-	2	1	-	-	-	-	-	-	-	-	-			
(W) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-			
SUBJECT MATTER KNOWLEDGE: 10	5	6	14	12	5	10	11	-	3	5	5	6	8	6	4	-	1	1	7	3	-	2	-	4	7			
(TH) 10	5	6	14	12	5	10	11	-	3	5	3	6	8	6	4	-	1	1	7	2	-	2	-	1	7			
(ST) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
(R) -	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	-			
(SB) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-			
(BK) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SUBJECT MATTER MOTOR: 62	71	69	56	65	83	67	67	84	69	78	83	81	78	79	81	84	86	82	80	93	94	92	97	87	81			
(P) 62	71	69	56	65	83	67	67	84	69	78	83	81	78	79	81	84	86	82	13	93	94	92	97	87	72			
(S) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-			
(G) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	-	-	9			
(F) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
NOT MOTOR ENGAGED: 62	50	47	57	60	40	48	47	60	57	48	44	40	29	50	33	48	38	43	36	23	29	27	5	30	31			
S-1 65	48	41	54	64	25	46	47	55	61	44	44	35	27	48	29	55	33	35	32	15	28	24	6	24	29			
S-2 53	55	56	61	65	54	50	50	55	58	47	39	43	28	50	36	52	34	48	42	31	35	31	6	38	35			
S-3 68	48	44	56	50	42	ab	50	69	53	53	50	43	32	51	32	39	47	45	36	21	25	27	3	29	28			
(I) 7	6	3	1	3	1	-	-	8	3	7	1	11	2	4	3	5	4	12	10	5	11	4	-	4	9			
(W) 24	27	19	32	35	16	15	7	41	33	20	23	17	8	20	10	29	7	11	8	7	4	9	1	4	8			
(OF) 3	2	5	5	3	1	-	3	1	3	4	-	2	1	6	6	1	5	3	1	3	4	5	2	4	-			
(ON) 16	8	14	4	6	11	12	19	7	15	7	-	4	10	9	7	12	13	16	8	2	5	4	2	8	8			
(C) 12	7	6	14	13	10	22	18	2	4	9	20	8	7	10	10	1	7	1	8	5	5	5	-	10	7			
MOTOR ENGAGED: 38	49	53	42	40	59	52	51	40	43	52	56	60	71	50	67	52	62	57	64	77	71	73	95	70	69			
S-1 35	51	56	46	36	75	53	53	45	39	56	56	65	63	52	71	45	66	65	68	85	72	76	94	76	72			
S-2 47	45	44	38	35	46	50	50	45	42	53	61	57	72	50	64	48	66	52	58	69	65	69	94	63	65			
S-3 32	51	56	56	50	58	ab	50	31	47	47	50	57	68	48	68	61	52	55	64	78	75	73	94	71	72			
(MA) 38	31	52	41	40	58	52	49	37	43	42	54	57	70	44	61	52	57	56	63	73	63	65	92	69	68			
(MI) -	2	1	1	-	1	-	1	5	-	4	2	3	1	5	6	-	6	1	1	4	2	6	2	1	1			
(MS) -	16	-	-	-	-	-	7	-	-	5	-	-	-	-	-	-	-	-	-	-	5	2	-	-	-			
ALT - PE: 38	31	52	42	40	58	52	42	36	43	42	54	57	70	44	61	52	57	56	65	73	63	65	92	69	68			
S-1 35	33	56	46	36	75	53	44	41	39	53	53	62	73	52	68	45	61	61	68	79	69	62	94	74	71			
S-2 47	33	44	38	35	46	50	41	41	42	37	58	56	72	41	48	48	56	52	58	62	48	63	90	63	65			
S-3 32	27	56	56	50	58	ab	44	24	47	37	50	53	66	42	68	61	50	55	64	78	72	73	92	72	69			

COMMENTS:

- P.T.A. REP. came out to talk w/teacher
- Parent came to talk w/ teacher
- Waiting time due to SAFETY factor
- Only 3 ropes used due to SAFETY
- Two students hurt during class time

Table 24

Observation Analysis for School 4.

ACTIVITY:	TUMBLING (7 of 10)	TUMBLING SKILL TEST (8 of 10)	TUMBLING SKILL TEST (9 of 10)	WARM UPS & RELAYS	RHYTHMS & SQUARE DANCE (1 of 7)	EXERCISES & STEAL THE FRISBEE GAME	RHYTHMS & SQUARE DANCE (2 of 7)	RHYTHMS & SQUARE DANCE (5 of 7)	GYMNASTICS--BALANCE BEAM (1 of 10)	GYMNASTICS--BALANCE BEAM (2 of 10)	GYMNASTICS--HORIZ. BARS (3 of 10)	GYMNASTICS & FITNESS (4 of 10)	GYMNASTICS (5 of 10)	GYMNASTICS (6 of 10)	GYMNASTICS & SKILL TEST (7 of 10)	GAME W/AIDE & SKILL TEST (8 of 10)	WARM UP & GAME	VOLLEYBALL--SERVING (1 of 8) & GAME	SERVING SKILLS & LEAD UP GAME (2 of 8)	OVERHEAD SET & LEAD UP GAME( ) of 8)	VOLLEY SKILLS & LEAD UP GAME (4 of 8)	VOLLEYBALL GAME (5 of 8)	VOLLEYBALL GAME (6 of 8)	VOLLEYBALL GAME (7 of 8)	VOLLEYBALL GAME & SKILL TEST (8 of 8)			
DATA POINTS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
GENERAL CONTENT:	25	19	17	31	20	41	50	28	11	13	25	27	22	19	12	16	30	27	23	21	27	26	18	33	26			
(T)	25	17	16	19	14	25	39	23	11	13	22	27	22	19	12	16	21	28	13	21	18	22	11	24	12			
(M)	-	-	-	-	3	-	3	-	-	-	2	-	-	-	-	-	-	-	2	-	1	-	5	-	1			
(B)	-	2	1	-	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-			
(W)	-	-	-	11	-	15	9	5	-	-	-	-	-	-	-	-	9	9	7	-	8	4	-	8	13			
SUBJECT MATTER KNOWLEDGE:	5	-	-	44	38	10	16	21	31	24	20	12	7	8	5	6	10	24	16	19	9	11	13	1	-			
(TN)	5	-	-	44	38	8	16	21	26	24	20	12	7	8	5	6	3	16	13	17	9	11	12	1	-			
(ST)	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3	-	-	2	-	-	1	-	-			
(R)	-	-	-	-	-	-	-	1	5	-	-	-	-	-	-	-	3	8	3	-	-	-	-	-	-			
(SB)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-			
(BK)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SUBJECT MATTER MOTOR:	70	81	82	26	42	48	33	52	57	63	55	61	70	73	82	77	60	39	62	60	63	63	68	65	74			
(P)	70	81	82	-	12	48	33	2	57	63	55	61	70	73	82	-	-	17	13	25	12	18	-	-	-			
(S)	-	-	-	-	31	-	-	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
(G)	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	77	46	22	29	28	36	27	68	63	66			
(F)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	19	6	15	18	-	3	8			
NOT MOTOR ENGAGED:	86	73	78	90	63	91	66	55	86	76	73	58	77	69	88	26	45	92	89	82	84	86	90	93	95			
S-1	94	91	90	94	66	83	69	50	92	65	66	55	85	60	84	23	44	91	90	78	91	100	86	95	93			
S-2	97	50	93	ab	51	96	66	47	86	84	83	61	74	73	95	27	44	94	90	87	79	84	ab	92	94			
S-3	68	77	56	87	70	93	64	69	83	81	71	ab	71	74	87	30	ab	92	87	81	85	76	94	95	97			
(I)	10	6	6	2	-	4	-	-	1	-	4	2	-	3	2	-	-	2	-	1	2	-	4	1	1			
(M)	47	45	41	32	26	54	38	24	45	48	38	33	42	40	64	9	29	54	43	56	58	35	54	72	80			
(OF)	11	6	6	10	5	-	2	3	5	2	4	-	16	4	9	-	-	3	1	1	1	1	3	-	1			
(ON)	6	13	24	23	3	22	11	8	5	3	8	9	8	10	3	10	5	9	29	3	12	38	13	18	13			
(C)	10	4	-	24	33	10	16	20	30	21	20	14	10	12	5	8	10	25	16	20	11	11	17	3	-			
MOTOR ENGAGED:	13	27	21	10	37	9	33	45	13	24	27	42	23	31	12	70	54	8	11	18	15	14	9	6	5			
S-1	6	8	10	6	32	16	31	50	8	35	34	45	14	40	16	77	56	9	10	22	9	0	14	5	6			
S-2	3	50	7	ab	49	3	33	53	14	16	6	79	26	26	5	73	53	6	10	13	21	16	ab	8	6			
S-3	31	22	46	13	28	7	36	31	16	19	10	ab	28	26	13	70	ab	8	13	19	15	24	6	5	3			
(MA)	9	14	9	10	37	9	24	45	9	10	23	32	11	29	11	30	19	3	11	18	15	14	9	6	5			
(MI)	-	-	-	-	-	-	9	-	1	9	1	8	-	-	1	-	-	-	-	-	-	-	-	-	-			
(MS)	3	13	12	-	-	-	-	-	3	5	3	3	11	2	-	40	35	5	-	-	-	-	-	-	-			
ALT - PE:	9	14	9	10	37	9	24	45	9	10	23	32	11	29	11	30	19	1	11	18	15	14	9	6	5			
S-1	6	6	10	6	32	16	13	50	5	10	35	24	6	40	16	33	21	0	10	22	9	0	14	5	6			
S-2	3	22	7	ab	49	3	28	53	11	10	14	39	11	26	5	30	18	0	10	13	21	16	ab	8	6			
S-3	20	14	11	13	37	7	31	31	11	10	22	ab	17	20	13	27	ab	3	13	18	15	24	6	5	3			

COMMENTS:

SAFETY & LIABILITY are major concerns of teacher. Water on the field & the bars available

Practice skill test. Pick 1 skill on each apparatus--name the skill & show it. Skills range from beginner to advanced-teacher notes

Aide took class so teacher could do skill test.

2 Classes together --

"PHILOSOPHY OF THIS UNIT IS TO PLAY THE GAME" quote from teacher.

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