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A comparison of Academic Learning Time- Physical Education of starting and non-starting collegiate football players

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A COMPARISON OF ACADEMIC LEARNING TIME-
PHYSICAL EDUCATION OF STARTING AND NON-
STARTING COLLEGIATE FOOTBALL PLAYERS

by

Paul R. Shaffner

An Abstract

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

September 1986

Thesis Advisor: Dr. Victor H. Mancini

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ABSTRACT

This study was conducted to compare the Academic Learning Time-Physical Education (ALT-PE) of starting and non-starting collegiate football players. Six varsity football coaches from the central New York area and their athletes served as subjects. Each coach was videotaped 18 times during practice throughout the 1981 season. The videotapes were coded using the revised ALT-PE observation instrument of Siedentop, Tousignant, and Parker (1982). Target athletes were selected weekly based on the status of the athletes as a starter or non-starter in the upcoming football game. Data obtained from these codings were compiled into percentages for all 21 ALT-PE categories. Visual analysis of the data revealed no significant differences in the context levels of starting and non-starting athletes. However, significant differences between athletes existed at the learner involvement level, particularly the motor appropriate engaged time (ALT-PE). Starting athletes were motor engaged more often (57.1% versus 47.4%), accrued more ALT-PE (39.6% versus 26.0%), and spent less time waiting (26.8% versus 37.4%) than their non-starting teammates. The results led to the rejection of the null hypothesis which stated that there will be no significant differences in ALT-PE between starting athletes and non-starting athletes.

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PHYSICAL EDUCATION OF STARTING AND NON-
STARTING COLLEGIATE FOOTBALL PLAYERS

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

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

by
Paul R. Shaffner
September 1986

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

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

Paul R. Shaffner

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

This thesis is dedicated to my parents and brother, whose love, support, and guidance have been so strong in all my achievements.

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Chapter 1

INTRODUCTION

For many years researchers investigating teaching and coaching have used systematic observation instruments to gather information on the behaviors of teachers or coaches and students or athletes. Most of this research has focused on the entire class or athletic team. Allard (1979) stated that the generality of results obtained from the whole class tended to overlook the differential teacher behaviors directed toward individual students. According to Rosenthal and Jacobson (1968), teachers varied their treatment toward students according to their expectations of those students. This has been referred to as the self-fulfilling prophecy, which simply means that students will tend to behave as they are expected to behave. Numerous interaction analysis systems have been used to investigate the self-fulfilling prophecy in the physical education and athletic settings. One of the most commonly used systems has been the Dyadic Adaptation of CAFIAS* (DAC) developed by Martinek and Mancini (1979). Through the use of this instrument researchers have been able to study differences between the teacher's/coach's interaction with high-skilled and interaction with low-skilled students/athletes.

Another systematic observation instrument that has been widely used is the Academic Learning Time-Physical Education (ALT-PE) (Siedentop, Birdwell, & Metzler, 1979; Siedentop, Tousignant, & Parker, 1982). Unlike interaction analysis, the ALT-PE instrument focused on student behaviors rather than teacher behaviors. ALT-PE was defined as the amount of time a student spends in a class activity engaged in relevant overt motor behavior, responding at a high success rate (Siedentop et al., 1979). Siedentop et al. (1979) found ALT-PE to be a reliable indicator of teacher effectiveness and student learning. Because the ALT-PE instrument was designed to focus on individual target students, the ALT-PE instrument can be used to examine the opportunities to learn provided to individual students in a class or to athletes on a team. Until recently, most ALT-PE research has been conducted using the entire class or team. However, the ALT-PE observation instrument provides researchers with an excellent opportunity to examine teacher/coach effectiveness with high- and low-skilled students/athletes.

Researchers have examined the traits or characteristics that make a coach successful. Darst, Langsdorf, Richardson, and Krahenbuhl (1981) stated that it was extremely difficult to specify "good coaching" behaviors, however, Darst et al. (1981) provided some general suggestions for enhancing the effectiveness of practice sessions.

1. Try to eliminate or reduce all unproductive time and shorten the overall length of the practice.
2. Make sure players get as much active practice as possible, and reduce on-the-field lecture time. Practicing a skill is more effective than listening to a coach talk about a skill.
3. Reduce waiting time.
4. Use praise as an effective teaching technique with athletes at all levels of participation.
5. Try to demonstrate exactly how a skill should or should not be performed.

The ALT-PE instrument can be used to examine coaching effectiveness and to investigate these suggestions of Darst et al. (1981) and other researchers. By using the ALT-PE instrument, possible differences in the effectiveness of the coach with athletes of high athletic ability as compared to coach effectiveness with athletes of lower athletic ability can be determined. This is the intent of the present investigation.

Scope of Problem

This study was designed to determine if differences exist between starters and non-starters in the amount of ALT-PE accrued during a regular football season. The subjects were six Division III collegiate varsity football coaches from the same school in the central New York area and their athletes. Target athletes were selected weekly based on the status of the athlete as

a starter or non-starter in the upcoming football game.

Eighteen 15-minute videotapes of each coach, for a total of 108 videotapes, were filmed randomly during practices throughout the 1981 football season. The tapes were coded after the completion of the season using the revised ALT-PE instrument (Siedentop et al., 1982).

Statement of Problem

The amount of ALT-PE experienced by athletes in a starting role and athletes in a non-starting role was investigated.

Null Hypothesis

There will be no significant differences in ALT-PE between starting athletes and non-starting athletes.

Assumptions of Study

The following assumptions were made for the purpose of the study:

1. Eighteen randomly selected 15-minute videotapes for each subject of practices throughout the 1981 football season yielded enough data to test the hypothesis.
2. The videotape of each practice for each coach was representative of the coach's entire practice.
3. The coaches' and athletes' behaviors in this study were observable and measurable, and the trained observer who recorded those behaviors did so in accordance with the behavioral definitions and observational system's instructions.
4. The interval recording techniques employed in

this study yielded a representative sample of athlete behavior to be found in continuous observation of behavior.

Definition of Terms

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

1. Starter was a player who was listed to start at his position for the upcoming football game.
2. Non-starter was a player who was not listed to start at his position for the upcoming football game.
3. Academic Learning Time-Physical Education (ALT-PE) was the amount of class or practice time a student or an athlete spends engaged in motor activities with a high success rate (Siedentop et al., 1982).
4. Academic Learning Time-Physical Education-Motor (ALT-PE-M) was the amount of ALT-PE accrued by a student (athlete) while directly engaged in motor skill tasks only (Siedentop et al., 1979).
5. Allocated Time was the time designated by the teacher/coach for learning a task (Metzler, 1982).
6. Engaged Time was the percentage of allocated time that the students/athletes were actively responding (Metzler, 1982).

Delimitations of Study

The following were the delimitations of this study:

1. ALT-PE was the only instrument used to record the athletes' involvement.
2. Collegiate male varsity football coaches and

athletes from one college in the central New York area were the only subjects in the study.

3. Each coach and his athletes were videotaped for 18 15-minute practice sessions.

4. The athletes' starting or non-starting status was the only procedure used in this study to classify the athletes.

Limitations of Study

The following were the limitations of this study:

1. The findings related to context level and the learner involvement levels of low- and high-skilled athletes may be valid for comparison only when the ALT-PE instrument is used to identify athletes' involvement.

2. Because only one college was used, the findings may only be valid for the football players and their coaches at the involved college.

3. The findings for coaches' effectiveness may be valid only to the extent that ALT-PE focused on coaches' behavior only indirectly; that is, it measured coach effectiveness as manifested through athletes' behavior in an observed setting.

Chapter 2

REVIEW OF LITERATURE

This study compared the differences in the involvement and the amount of Academic Learning Time-Physical Education (ALT-PE) accrued by athletes in a starting role and athletes in a non-starting role. The review of related literature focused on the following areas: (a) development of ALT-PE, (b) research using ALT-PE, (c) high-skilled and low-skilled students and athletes, and (d) summary.

Development of ALT-PE

In 1972 the California commission for Teacher Licensing and Preparation began a multi-year research project to study the teaching of reading and mathematics in classrooms. This research effort was entitled the Beginning Teacher Evaluation Study (BTES). In a very simple goal statement, the Commission stated its purpose was to determine which teacher classroom behaviors were related to student academic learning (Fisher, Berliner, Filby, Marliave, Cahen, Dishaw, & Moore, 1979).

Berliner (1976) suggested that the influence exerted by teacher behavior on student achievement was both complex and indirect. Berliner stated that the student's active time-on-task was the link to student achievement. Recent research efforts have tended to confirm the commonsensical idea that time-on-task was positively related to student achievement.

From their initial research and investigations the

BTES team constructed their own model of the teaching-learning process. This served as the conceptual framework and foundation for the second phase of the BTES study, the field investigations. Fisher et al. (1979) stated that an observable measure of student classroom learning was the amount of time the students spent working on school tasks. Therefore, the BTES model centered around the conceptualization of time variables and their relationship to student learning outcomes (Metzler, 1979). The BTES model eventually came to be known as the Academic Learning Time (ALT) model.

The ALT model had four basic components: (a) allocated time, (b) engaged time, (c) student success rate, and (d) task relevancy (Metzler, 1979). Allocated time was defined as that time designated by the teacher for a task-relevant activity. Engaged time was the percentage of allocated time the student spent on-task. The degree to which the students correctly understood the instructional tasks they were assigned was defined as success rate, with student success rated as low, medium, and high. Success rate was intended to reflect the appropriateness of the task for the student working on it. Task relevancy reflected the degree to which the task in which the student was engaged related to the instructional objectives. The BTES model of instruction stated that the accumulation of ALT represented student achievement. The BTES researchers concluded that the more ALT a student

accumulated the more the student was learning (Fisher et al., 1979).

The ALT model proposed that the more time a student spent working at a high success level the greater the student's achievement. However, this did not necessarily imply that all of a student's time should be spent in the high success condition. If all the student's tasks were so easy that he/she was never challenged with new material, then little new learning was likely to occur (Fisher et al., 1979). Low success rate, conversely, was always negatively correlated with achievement.

Fisher et al. (1979) reported four major findings directly concerned with the relationship of ALT to student achievement.

1. The amount of time that teachers allocated to instruction in a particular curriculum content area was positively associated with learning in that content area.

2. The proportion of allocated time that students were engaged was positively associated with learning.

3. The proportion of time that reading or mathematics tasks provided a high success rate for a student was positively associated with student learning.

4. The proportion of time that reading or mathematics tasks provided a low success rate for a student was negatively associated with student learning.

Birdwell (1980) cited eight other findings that concerned the relationship between ALT and student

achievement.

1. The teacher's ability to diagnose student skill level was positively related to student achievement and ALT.

2. The teacher's ability to prescribe appropriate tasks was positively related to student achievement and success rate.

3. More substantive interaction between the student and teacher was associated with higher levels of student achievement.

4. Academic feedback was positively associated with student learning.

5. The structure of lessons and giving directions on task procedures was positively associated with student success rate.

6. Explanation specifically in response to student need was negatively associated with student success rate.

7. Frequent reprimands for inappropriate behaviors were negatively associated with student success rate.

8. A learning environment characterized by student responsibility for academic work and by cooperation on academic tasks was associated with higher student achievement.

Fisher et al. (1979) concluded that students who accumulated more ALT generally had high scores on achievement tests. This meant that ALT can be interpreted as an immediate ongoing measure of student learning.

Another project which investigated involvement and student achievement was the Juniper Gardens Children's Project (JGCP). Unlike the BTES project, which had its roots in educational research, the JGCP had its foundation focused in behavioral analysis. As the JGCP research program progressed, it became clear to the investigators that educational performance could be enhanced by systematic reinforcement procedures and by rearranging the material and human resources of the educational environments (Hall, Delquadri, & Harris, 1977). However, a new direction for research reappeared consistently. It was the need for students to have increased opportunity to respond actively, which related to higher student achievement (Siedentop, Birdwell, & Metzler, 1979). In a follow-up study JGCP reported results similar to those of the BTES study. The BTES team found ALT to be very low in mathematics and reading instruction, and JGCP found the opportunity to respond to be equivalently minimal (Metzler, 1979).

A unique relationship existed between the BTES and JGCP, despite the fact they were conducted under two different conditions and methods. These two highly competent research teams found similar results--that student time involvement and success rate related to ALT and opportunity to respond. Given the assumption that student ALT and opportunity to respond were two different ways to view the same phenomenon, the strong

research findings from BTES and JGCP represented substantial convergent validity for the concept of ALT (Birdwell, 1980).

The next progression of interest to the current study was to see how the concept of ALT applied to the physical education setting. Inspired by BTES research, Siedentop et al. (1979) adapted ALT to physical education teaching. Academic Learning Time-Physical Education (ALT-PE) was an attempt to estimate teacher effectiveness in physical education in the absence of valid and reliable student performance data. ALT-PE was assumed to be strongly and consistently related to achievement in physical education. In physical education, it was difficult to measure the product because there were few useful standardized achievement tests. Another strategy needed to be found which might enable physical educators to make judgments about teacher effectiveness without having the relevant student achievement data (Siedentop et al., 1979). From the perspective of Siedentop et al. (1979), when achievement was difficult to measure, as for some physical education learning objectives, time-on-task or ALT became a legitimate substitute for students' achievement and an indirect measure by which to judge teacher effectiveness.

Siedentop et al. (1979) have defined ALT-PE as the amount of time students spent in class activity engaged in relevant overt motor responses at a high success rate.

The determinant variables of ALT-PE formed a sound theoretical perspective from which to analyze students' opportunities to acquire the skills and knowledge of motor play activities (Metzler, 1982).

Metzler (1982) developed an achievement-centered ALT-PE model to help teachers design experiences that provide students with more opportunities to learn motor play skills. He stated that its greatest strength was an ability to provide a logical blueprint for planning instructional decisions and behaviors in the physical education setting, regardless of the teaching methods used.

Siedentop et al. (1979) used the ALT-PE model to develop a systematic observation instrument to help researchers investigate the amount of ALT-PE accrued by students in physical education class. The observation and systematic recording of ALT-PE involved four major category decisions, those of setting, content, learner moves, and difficulty level. The setting categories described the basic format for instruction within the class. The content level described the focus of the instructional content during the interval. The third decision reflected the involvement of the individual learner within the physical education content. The final category decision required the observer to judge the difficulty level of the learner's involvement with the subject matter. A hierarchical decision system was used.

Decisions on learner engagement were made only for the observations in which physical education content had already been coded. Decisions on difficulty level were made only for those observations in which physical education content and learner engagement had been coded. Siedentop et al. (1979) stated that 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. With the interval recording procedure, the occurrence or non-occurrence of the defined behaviors within specified time intervals was measured. The duration of the ALT-PE instrument interval was 12 seconds. The time allotted for observing the target student was 6 seconds, with the next 6 seconds allotted for entering coding symbols and locating the next student for observation. Three target students were observed in sequence during each class, making the observation cycle 36 seconds long (Metzler, 1979).

In 1982, Siedentop, Tousignant, and Parker developed a revision to the ALT-PE system. The revised ALT-PE instrument was conceptualized as a two-level, hierarchical decision system. The first level of the system required a decision regarding the context of the setting under observation within which specific individual student behavior was occurring. There were three major subdivisions at the context level--general content, subject matter

knowledge, and subject matter motor. The second level involved observations of individual learner involvement and was designed to describe the nature of the learner involvement. There were two major subdivisions at the learner involvement level--not motor engaged and motor engaged. The same recording format was used in the 1982 revision as was used in the original system.

Most of the research using the ALT-PE instrument has been conducted with the original ALT-PE instrument. The reader should be aware of the similarities between the original and the revised system. The subdivisions of subject matter knowledge and subject matter motor in the revised system contained almost the identical categories as physical education-content (content-PE) in the original system. General content categories were similar in both systems, with the exception that warm-up in the revised system replaced waiting in the original system. Motor engaged categories in the revised system were similar to the motor categories in the original system. ALT-PE in the original system consisted of both motor activity and cognitive activity, whereas, ALT-PE in the revised system was motor appropriate activity and was coded when the target student was successfully engaged in relevant motor activity. ALT-PE in the revised system was similar to ALT-PE(M) in the original system. Most other individual categories remained the same.

Research Using ALT-PE

The ALT-PE observation system is a relatively new system. Since being developed in 1979, only a few studies have been completed. In this section, the findings of ALT-PE research relevant to this investigation are presented.

The ALT-PE observation instrument has been used to provide descriptive results of the ALT-PE accrued by physical education students. The first study that actually used ALT-PE was conducted by Metzler (1979) and involved two phases. The first phase was the conceptualization of ALT-PE, which was discussed earlier, and the second phase involved the measurement of ALT-PE in a variety of physical education classes. The subjects were the students of 21 in-service physical educators. A total of 92 students were observed in 14 separate physical education activities in elementary, junior high, and senior high schools. Metzler reported that, when all categories of engagement were considered, students in physical education spent an average of 28.6% of their time in ALT-PE. The data also indicated that teachers of physical education at all levels designated a large proportion of class time for practice and instruction. However, there was a mean difference of 12% between what teachers estimated for practice and instruction time and what was actually observed to occur. He suggested that teachers of physical education either did not plan

well or were not fully aware of their time involvement. Metzler's findings indicated that teachers must plan better so as to increase the actual amount of time 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 can be realized.

Descriptive results of a field study of ALT-PE were presented by Metzler in 1980. In-service teachers ($N = 21$), seven each in elementary, junior high, and senior high, were used in the study. Metzler stated that ALT-PE represented a bottom-line construct of teacher process effectiveness--that is, all class time which is not contributing to learning outcomes in the class are eliminated in the determination of ALT-PE. He found that ALT-PE percentages per class period were 32.3%, 28.1%, and 20.9% in elementary school, junior high, and senior high, respectively. An interesting finding was that although elementary level students spent fewer minutes in class than senior high level students they accrued a greater percentage of ALT-PE than their senior high counterparts. ALT-PE(M) showed the same relationships among the three levels as did ALT-PE, with elementary, junior high, and senior high students accumulating 9.1%, 8.3%, and 5.0%, respectively. Metzler stated that the variable of ALT-PE(M) should be considered a better indicator of a student's opportunity to acquire physical

education motor skills than the general variable of ALT-PE. During team activities, general ALT-PE was coded more often; in individual activities ALT-PE(M) was coded more often. This suggested that there may be a difference in the ways students are instructed in team activities and individual activities. It was also found that neither ALT-PE nor ALT-PE(M) increased during the unit observations.

Metzler (1981a) conducted another study on the ALT-PE accrued by students in activity classes taught at the college level. Observations took place in eight different activities. It was found that nearly 45% of all observed intervals were coded as ALT-PE in the college classes, and the observed amount of ALT-PE(M) was 18.5%. In the college classes, both ALT-PE and ALT-PE(M) were nearly twice the observed ALT-PE and ALT-PE(M) in the K-12 classes.

An analysis of the reliability of the ALT-PE observation system was conducted by Godbout (1980). Due to the increasing interest in the concept of ALT-PE and the observational system designed to measure it, it became necessary to establish its reliability. Godbout's study investigated the reliability of the ALT-PE system when observers and target students were considered as sources of error. Seven male and seven female physical educators at the secondary level were used in the study. Four major variables of interest were investigated:

(a) time allocated to content-PE, (b) learner engaged time

in task relevant material, (c) student success rate with the material, and (d) ALT-PE. The results clearly indicated a high level of reliability for three major dependent variables: allocated time, learner engaged time, and ALT-PE. The low reliability observed in the case of the student's success data seemed to be more a reflection of an increased error term. The resulting coefficients of generalizability were .81 for one observer and three target students and .93 for two observers and six target students. Godbout suggested that due to the magnitude of the reliability coefficients, whenever the cost of hiring observers becomes a critical factor, reasonably reliable results can still be obtained with one observer focusing on three target students.

The ALT-PE instrument has also been used to describe the effects of various intervention strategies on accrued ALT-PE of students. Birdwell (1980) conducted a study on the effects of a package intervention, which consisted of instructions and daily feedback, on the teaching behaviors of three in-service physical educators to determine if there was a subsequent increase in student ALT-PE. The three in-service teachers, one each from the elementary, junior high, and senior high levels, participated in short clinics designed to change teaching behaviors. The behaviors targeted for change were management time, feedback, and student nonengagement. The ALT-PE observation system was modified by adding a teacher behavior category. This gave a picture of

what the teacher was doing while the students were engaged in physical activity. Birdwell found that there was an association between changes in teacher behaviors and increases in student ALT-PE. Significant increases in ALT-PE and ALT-PE(M) appeared to be associated with decreases in teachers' management time, increases in feedback to students, and decreases in time spent not engaged in content-PE. Birdwell concluded that giving instructions and daily feedback to teachers was a successful and cost effective method for changing teachers' behaviors and for helping teachers change student behaviors.

Research on the effects of daily monitoring and feedback on ALT-PE was completed by Whaley (1980). The subjects consisted of 12 public school physical education students at four separate schools. The four instructors were all in-service physical educators with 5 or more years of experience. Whaley used Birdwell's (1980) modification of the ALT-PE system with the addition of a category for spotting. The study consisted of three phases. The baseline phase extended from the start of the study until feedback started. The second phase involved an intervention with the teacher by providing daily feedback on content-PE, engaged time, motor response time, ALT-PE, and ALT-PE(M). Intervention with the students constituted the final phase of the study. During this phase feedback was provided on motor response attempts. Whaley reported that the interventions did not significantly

affect ALT-PE nor did teacher behavior change. Whaley concluded that feedback to the teachers had no effect on the amount of time devoted to physical education, feedback to the teachers had no effect on the amount of engaged time experienced by students, feedback to teachers and students had no effect on ALT-PE or ALT-PE(M), and changes in ALT-PE and ALT-PE(M) were associated with changes in activities rather than with introduction of the interventions.

The effects of feedback on the ALT-PE(M) of two student teachers at the secondary level were researched by Paese (1982). After each observed class, verbal and written feedback and strategies on how to decrease management time and increase the motor responses of the class were provided to each student teacher. Paese's results indicated that both student teachers demonstrated an increase in ALT-PE(M). ALT-PE(M) increased from a mean of 7.5% during baseline to 19% during intervention. Engaged motor responses increased from 18.5% to 43%. Paese concluded that the ALT-PE coding instrument was a valuable tool for supervisors to assess teacher performance and to improve instruction.

Metzler (1981b) conducted a study to determine if ALT-PE(M) in archery could be increased through the use of an intervention strategy. He wanted to increase the percentage of engaged motor intervals with the intent of increasing ALT-PE(M) by the target students. Three

students from each of two archery classes conducted by student teachers served as subjects. The data showed that increases in engaged motor response occurred immediately after interventions, with concurrent increases in ALT-PE(M). Metzler reported an average increase of 127.5% and 204% for engaged motor response and ALT-PE(M), respectively. Metzler concluded that the simple intervention of adding extra arrows and having two students shoot at the same target simultaneously resulted in high increases in the percentage of engaged motor responding intervals and subsequently in ALT-PE(M).

Wurzer (1982) examined the effects of three instructional packages on teacher behavior to determine if there was a subsequent change in student ALT-PE. Each of three university volleyball professors received an instructional package designed to change management time, feedback, and student nonengagement. Birdwell's (1980) modification of ALT-PE was used for all the observations. Wurzer reported that the intervention was successful in changing the target behaviors, ALT-PE and ALT-PE(M), for all students. Decreases in teacher management time and the time students spent not engaged as well as increases in feedback to students were associated with a significant increase in student ALT-PE and ALT-PE(M). The study demonstrated that the instructional packages were a successful method of changing teacher behaviors and student ALT-PE.

The purpose of Young and Metzler's (1982) study was to measure student achievement in a 20-minute experimental teaching unit (ETU) as a function of accrued amounts of ALT-PE. The subjects in the study were 90 elementary students of four physical educators. A novel skill task was used to reduce the effects of prior student learning. Young and Metzler reported that the correlation between skill achievement and ALT-PE was not strong, however, it was statistically significant and in the proper direction, showing that high ALT-PE scores positively related to better achievement.

Rate (1980) was the first researcher to use the ALT-PE observation instrument in a coaching setting. Rate used the ALT-PE instrument to determine the nature of ALT-PE in secondary school athletic practice sessions, the differences in ALT-PE between the physical education and athletic settings, the differences in ALT-PE among various interscholastic teams, and the behavior patterns of coaches in the athletic setting. Rate added one additional level to the ALT-PE instrument to determine coach behavior. Data were obtained from 46 teams, including basketball, wrestling, gymnastics, tennis, and baseball. Rate's findings revealed the following:

1. Instruction was of the direct style 75% of the time.
2. Content-general time was spent in transition activities 70% of the time.

3. Waiting, management, and break time amounted to less than 3% of total practice time.
4. Practice time was spent in content-PE activities 90% of the time.
5. Nearly 75% of the content-PE was conducted as skill practice and scrimmage.
6. Athletes were involved in cognitive activities 7% of the practice time.
7. Athletes were engaged for 60% of all content-PE time.
8. Athletes spent 68% of their engaged time in direct motor activities.
9. Athletes spent 53% of their nonengaged time waiting to perform.
10. Practice tasks were of an easy level 98% of the time.
11. ALT-PE across all practice sessions averaged 49.3%.
12. ALT-PE(M) across all practice sessions averaged 33.2%

High-skilled and Low-skilled Students and Athletes

Research has provided considerable evidence that teachers interact differently with students of different achievement levels. Brophy and Good (1970) noted that teachers do treat students differently; students do not receive equal classroom opportunities or equal amounts of praise from their teachers.

Brophy and Good (1970) developed a system to analyze how the child functions in the classroom and to provide information about how the teacher and an individual student interact. They used their system to examine the relationship between teacher expectancies and pupil achievement. Brophy and Good's results showed that high achievers initiated more contacts with teachers, teachers demanded better performances from students designated as high achievers, and teachers were more likely to praise those children for whom they held high expectations. When low-expectation students could not answer questions, teachers either answered the question for them or called on someone else; with high-expectation students they either repeated or rephrased the question.

Because of the increasing body of research confirming that teachers interact with students differently, Allard (1979) recommended studying dyadic interactions in the physical education setting in order to achieve a more complete description of teacher-pupil interaction. These studies were based on evidence about expectancy effects provided in Rosenthal and Jacobson's (1968) book, Pygmalion in the Classroom. They hypothesized that teachers gave differential treatment to their pupils as a result of certain expectations that are held by the teacher. They also predicted that these expectations for student achievement would function as a self-fulfilling prophecy. The self-fulfilling prophecy, as described by Martinek and

Johnson (1979), is an expectation or prediction which initiates a series of events that causes the original expectation to come true. In simpler terms, if a teacher expected a particular student to be a high achiever and began acting towards that student in a certain manner, the student may live up to those expectations and behave as a high achiever. This self-fulfilling prophecy was found to be true of a teacher who viewed a student as a low achiever.

Several researchers (Boyes, 1981; Crowe, 1979; Hoffman, 1981; Martinek & Johnson, 1979; Oien, 1979; Reisenweaver, 1980; Streeter, 1980) have used dyadic observation systems to investigate teacher expectancy effects on students and athletes. Crowe (1979) used the Brophy and Good (1970) system to examine the effects of teacher expectations on five variables (climate, feedback, output, input, and touch) with low- and high-expectancy junior high students. Results showed that the high-expectancy students were asked more questions, given more opportunities to respond, treated with more warmth, taught more new materials, given more attention, and given more positive comments when answering questions with desired responses.

In Martinek and Johnson's (1979) study, elementary school physical education teachers were asked to classify their students into low- and high-skilled groups. The teachers' interactions with different ability groups were then analyzed. Results showed that high-skilled

students received more encouragement, acceptance of ideas, and analytical-type questions from their teachers.

A study conducted by Oien (1979) used a modification of CAFIAS to examine the quality and quantity of individualized teacher behavior. It was based on student gender and teacher's perception of the student's in-class personality, skill performance level, and participation. The data were collected from junior high school physical education classes through the individualized Teacher Behavior Analysis System (TBAS). Oien found that boys were the recipients of more praise and encouragement, questions, lectures, directions, and criticisms than girls.

Reisenweaver (1980) and Streeter (1980) used the DAC system to compare the teaching behavior patterns of 15 female (Reisenweaver, 1980) and 15 male (Streeter, 1980) secondary physical educators in their interactions with high-skilled students and with low-skilled students. They concluded that interactions with the high-skilled group included significantly more praise, acceptance of student ideas and actions, teacher questioning, teacher information-giving, student interpretive response, and student-initiated response. Interaction with the low-skilled group included significantly more teacher direction, teacher criticism, and student predictable response (Reisenweaver, 1980; Streeter, 1980).

Pieron (1982) conducted a study using ALT-PE to compare high and low achievers in volleyball and gymnastics activities. He found that in these two settings low and high achievers differed significantly. The differences were strikingly greater when specific motor skill learning activities were concerned. He concluded that when considering the time-on-task and success rate variables, high achievers found more opportunities to learn than low achievers. He also suggested that the performance gap between high and low achievers was expected to widen because high achievers had more opportunities to engage in more productive behaviors. The expectancy phenomenon was not fully confirmed by Pieron's data. Teachers behaved approximately in the same way with low achievers as with high achievers. Teachers tended to react more frequently to low achievers' unsuccessful trials than to the high achievers' unsuccessful trials. The low achievers were provided with more feedback and encouragement.

Shute, Dodds, Placek, Rife, and Silverman (1982) conducted a study to describe the accrued ALT-PE of low-, medium-, and high-skilled students in elementary movement education classes. Subjects were a female physical educator and 105 elementary school children. Students rated by the teacher as low-, medium-, and high-skilled were engaged in content-PE activities 80%, 78%, and 78% of the time, respectively. High-skilled students were engaged in ALT-PE(M) 16% of the time, and low-skilled students were

engaged 13% of the time. No significant differences were discovered among the skill groups in other ALT-PE categories. Shute et al. (1982) concluded that this teacher created learning environments in which all children found equal amounts of success, even though they performed in a wide range of skill difficulty.

Researchers have studied not only high- and low-skilled students but high- and low-skilled athletes as well. Boyes (1981) conducted an investigation to determine if the behavior of NCAA Division III college football coaches varied as they interacted with athletes of different abilities. Athletes were selected based on their starting or non-starting status prior to each game. The DAC system was used as the testing instrument. Visual analysis of data showed minimal differences existed in the interaction behavior of the coaches with their starting athletes and with their non-starting athletes. The starting athletes received more praise and acceptance of their ideas and actions from the coaches than the non-starting athletes received. Boyes also found that the non-starting athletes received more directions from the coaches. The starting athletes were characterized by interpretive, self-initiated behaviors, whereas, the non-starting athletes' behaviors were predominantly predictable in nature.

Hoffman (1981) compared the interaction behavior patterns of one male and one female collegiate lacrosse coach with high- and low-skilled athletes using DAC.

Hoffman concluded that high-skilled athletes received more attention and encouragement. The high-skilled athletes initiated more responses than the low-skilled athletes. The coaches expressed more criticism and gave more directions to the low-skilled athletes, which promoted further predictable responses from the athletes.

Another study that used male and female collegiate lacrosse players was conducted by Thomas (1983). However, Thomas used the revised ALT-PE observation system as his instrument. He concluded that high-skilled players had more opportunity to actively perform and were more successful and effective (ALT-PE) in performing lacrosse skills than their low-skilled teammates. Low-skilled lacrosse players spent more time waiting for their turn to participate than did their high-skilled counterparts.

Galli (1982) conducted a study to determine if differences existed in the ALT-PE of a male secondary high-skilled basketball player and a male secondary low-skilled basketball player. Examination of the data resulted in the finding of minor differences in accumulated ALT-PE between the high-skilled and low-skilled players. The data revealed that game, knowledge, not-engaged interim, not-engaged waiting, engaged motor, and ALT-PE categories accounted for the differences between players. Galli reported that the high-skilled player had a greater percentage of time in game, engaged motor, not-engaged waiting, and ALT-PE than the low-skilled player. The

low-skilled player spent a greater percentage of time in knowledge and not-engaged interim than the high-skilled player. Galli also found that both players spent 85% of all practice time in content-PE, and no differences existed between the two players in the amount of time spent engaged in motor tasks at an easy level of difficulty (ALT-PE(M)).

Three studies that used systematic observation but did not look at differences between high- and low-skilled athletes will be reviewed in this section. The relevance of these studies lies in the fact that they used football players and coaches as their subjects.

Langsdorf (1980) conducted a study to determine the coaching behaviors of a highly successful major university head football coach, Frank Kush, and to compare his behaviors to Tharp and Gallimore's (1976) data on John Wooden. Langsdorf (1980) found that the greatest percentage and rate of behavior for Kush occurred in the categories of instruction, hustle, and scold/reinstruction. The comparison between the two coaches, Kush and Wooden, showed considerable similarity, with a correlation coefficient of .85. The results of this study might have some implications for coaches in general; it appeared that (a) prospective coaches would seem to benefit from training in instruction-giving techniques, (b) scold statements may be most effective if they carry instructional information, and (c) praise may not be

as important a motivator in high level coaching environments as some other behaviors, including scolding, may be.

Darst, Langsdorf, Richardson, and Krahenbuhl (1981) objectively recorded how football players spent their time during a practice session. It was assumed that the learning of physical skills necessary for football would be affected by the amount of time that players spent doing certain activities in practice, a concept similar to ALT-PE. The data indicated that the players spent large amounts of practice time waiting during all segments except warm-up and conditioning. Drills, plays, and physical activity represented the next most common ways that practice time was spent, except during one-on-one and scrimmage. In addition, practice time was divided into productive and unproductive time. Productive time was determined by adding the time spent in drills, plays, and receiving instruction, while unproductive time was defined as the combination of waiting, huddle time, relocation, and resting. Darst et al. (1981) found it important to point out that while it was necessary to include all of the activities classified as unproductive in practice sessions, the time spent in these activities should be kept to a minimum. Coaches should be aware of the productive-unproductive ratio in each segment of their practices. The most productive segments were warm-up (90% productive) and agility (50%), while the least productive were one-on-one (12%) and scrimmage (15%).

Sciera (1983) used CAFIAS to investigate coaching behavior during preseason, after wins, and after losses of six collegiate football coaches. He concluded that coaches used more acceptance, praise, and information-giving behavior during preseason than during the regular season. After wins the coaches used less acceptance and praise, while after losses there was a significant increase in the use of criticism. Sciera reported that athlete behavior during preseason was characterized by predictable nonverbal responses to mechanical drills. Athlete behaviors after wins were more interpretive than predictable, however, after losses predictable and interpretive behaviors were evenly distributed. The coach's greatest contribution to practice was during preseason, while the athletes' greatest contribution was after losses.

Summary

The conceptualization of ALT-PE began with the research effort entitled BTES. The BTES model centered around the conceptualization of time variables and their relationship to student learning outcomes (Metzler, 1979). The BTES model eventually came to be known as the ALT model. Another research group, the JGCP, found that increases in the learner's opportunity to make academic responses resulted in higher achievement. The BTES and JGCP provided the rationale for ALT to be used as an indicator of student achievement and as an estimate of teacher effectiveness.

The ALT model was modified by Siedentop et al. (1979) for use in the physical education setting. Originally the ALT-PE instrument involved a four-level decision hierarchy. In 1982 Siedentop et al. revised the system to a two-level, hierarchical decision format.

ALT-PE has been used in a number of research efforts. From these efforts it was found that on the average only 9 minutes of ALT-PE and only 2.5 minutes of ALT-PE(M) were accrued by students during class across all levels (Metzler, 1979, 1980). Generalizability coefficients were found to be high enough ($r = .81$) that one observer and three target students would yield reliable results (Godbout, 1980). Young and Metzler (1982) found that ALT-PE scores positively related to increases in motor skill achievement. The first study that used the ALT-PE instrument in coaching was conducted by Rate (1980), who found that 49.3% of ALT-PE and 33.2% of ALT-PE(M) were accrued by athletes.

The self-fulfilling prophecy, as described by Martinek and Johnson (1979), is an expectation or prediction which initiates a series of events that causes the original expectation to come true. Brophy and Good (1970) found that high achievers initiated more contacts with teachers, teachers demanded better performances from students designated as high achievers, and teachers were more likely to praise those children for whom they held high expectations. In physical education, it was found that

high-skilled students received more praise, acceptance, questions, and exhibited more interpretive responses than the low-skilled students, while the low-skilled students exhibited more predictable responses than the high-skilled students (Crowe, 1979; Martinek & Johnson, 1979; Oien, 1979; Reisenweaver, 1980; Streeter, 1980). High-skilled and low-skilled students differed in the amounts of ALT-PE accrued by the respective groups (Pieron, 1982). However, Shute et al. (1982) found that no differences existed in the amount of ALT-PE accrued by high- and low-skilled students. Also, high-skilled athletes had more opportunities than low-skilled athletes had to actively perform successfully and effectively, while the low-skilled spent more time waiting (Galli, 1982; Thomas, 1983).

A variety of coaching studies have been conducted using systematic observation. Langsdorf (1980) studied a famous football coach and found that the instruction, hustle, and scold/reinstruction categories rated the highest. Darst et al. (1981) found that football players spent the largest amounts of their practice sessions waiting, and rated second was participating in drills, plays, and physical activity. Sciera (1983) concluded that the coach's greatest contribution to practice was during preseason. He also concluded that athletes exhibited different behaviors after wins and after losses.

Chapter 3

METHODS AND PROCEDURES

This chapter is concerned with the methods and procedures that were utilized in this investigation. This chapter will include the selection of subjects, the testing instrument, intraobserver agreement, procedures, methods of data collection, scoring of data, treatment of data, and summary.

Selection of Subjects

The subjects were six male football coaches from the coaching staff of a single NCAA Division III college varsity football team in central New York and their athletes. Coaches were personally contacted, and permission was requested for the gathering of data. Each coach signed an informed consent form, and the athletes participating in the study signed an athlete informed consent form (Appendices A and B). Target athletes were selected weekly based on the status of the athlete as a starter or non-starter in the upcoming game.

Testing Instrument

The testing instrument used in this investigation was the 1982 revision of the Academic Learning Time-Physical Education observation instrument (ALT-PE) (Siedentop, Tousignant, & Parker, 1982). The ALT-PE instrument provided a description of athletes' activities and the amount of time athletes were successfully engaged in performing relevant

motor tasks or ALT-PE.

The duration of the ALT-PE instrument coding interval was 12 seconds. In each interval, the coder allotted 6 seconds for observing the target athletes and 6 seconds for entering coding symbols and locating the next athlete's for observation.

Intraobserver Agreement

The scored-interval agreement method (Hawkins & Dotson, 1975) was used to assess intraobserver agreement (IOA) for this investigation. Four randomly selected videotapes were coded by Dr. Victor Mancini, an expert coder, during two independent coding sessions. IOA was calculated on an interval-by-interval basis. It was computed by dividing the number of intervals on which there was agreement by the number of agreements and disagreements and multiplying the results by 100 (Herson & Barlow, 1976). The formula is given below:

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

Procedures

Each coach was videotaped for 18 15-minute practice segments throughout the 1981 season, a total of 108 videotapes. Random segments of each coach's practice were taped. At the end of the season, data for the final analysis were collected from the videotapes of each coach. An expert coder trained in the use of ALT-PE coded all videotapes. A preprogrammed audio-tape was used to provide cues to observe and to record.

Method of Data Collection

Three randomly selected athletes from the starting roster and three randomly selected athletes from the non-starting roster from each coach's group were observed during each practice session. Using the ALT-PE instrument the athlete's involvement during each practice was coded by Dr. Victor Mancini. The target athletes were observed alternately by the observer using a 6-second observe, 6-second record format. During each interval, both a starting and a non-starting athlete were observed.

Scoring of Data

ALT-PE data collected were hand-scored. The data were then compiled into percentages and ratios for the ALT-PE parameters.

Treatment of Data

Descriptive statistics were used to calculate the mean percentages for each ALT-PE category. Visual comparisons were made to determine whether differences existed between starting and non-starting athletes' involvement and ALT-PE during the season.

Summary

The subjects in this study consisted of six male varsity football coaches at the collegiate level in the central New York State area and their athletes. Eighteen 15-minute videotapes of each coach were used to collect the data. Three starters and three non-starters were selected from each coach's group for each coding session.

The ALT-PE data were compared to determine if differences existed in the activities and the amount of ALT-PE between starters and non-starters.

The ALT-PE system was used to code the videotapes. The data were then analyzed to determine whether differences in athlete involvement, as identified by ALT-PE, existed between starting and non-starting athletes.

Chapter 4

ANALYSIS OF DATA

The results found when comparing the Academic Learning Time-Physical Education (ALT-PE) of starting and non-starting collegiate football players are presented in this chapter. The observation instrument used to code the ALT-PE of the athletes was the 1982 revision of the ALT-PE instrument designed by Siedentop, Tousignant, and Parker (1982). The ALT-PE instrument described the context levels and learner involvement levels of the players. This chapter is divided into the following sections: (a) intraobserver agreement, (b) analysis of the data, and (c) summary.

Intraobserver Agreement

Intraobserver agreement (IOA) scores were calculated using the scored-interval method (Hawkins & Dotson, 1975). Four randomly selected videotapes were each coded twice by Dr. Victor H. Mancini, an expert in descriptive-analytic studies, once at each of two independent coding sessions. IOA scores ranged from 90.7% to 100%, which were sufficient to indicate the coder was reliable.

Analysis of the Data

Coach 1

Analysis of the data from the comparison of starters and non-starters of Coach 1 are shown in Table 1. A visual comparison of the context level yielded no significant differences. At the learner involvement

Table 1
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 1

ALT-PE Categories	Starters	Non-starters
General Content	1.6%	1.6%
Transition	1.6%	1.6%
Management	.0%	.0%
Break	.0%	.0%
Warm-up	.0%	.0%
Subject Knowledge	10.9%	10.8%
Technique	5.3%	5.2%
Strategy	5.1%	5.1%
Rules	.5%	.5%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	87.5%	87.6%
Practice	32.8%	32.9%
Scrimmage	54.7%	54.7%
Game	.0%	.0%
Fitness	.0%	.0%

Table 1- (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	42.8%	47.3%
Interim	.1%	.2%
Waiting	23.9%	28.4%
Off-task	.0%	.0%
On-task	1.6%	1.6%
Cognitive	17.2%	17.1%
Engaged Total	57.2%	52.7%
Motor Appropriate	36.4%	28.4%
Motor Inappropriate	14.9%	18.1%
Motor Supporting	5.9%	6.2%

level, visual comparison showed several significant differences. In the not motor engaged category, starters and non-starters accrued 42.8% and 47.3%, respectively, for a difference of 4.5%, which was considered to be slightly significant. In the motor engaged category it was found that the starters accrued 57.2% and non-starters accrued 52.7%, with a difference of 4.5%, which was also found to be slightly significant. The most significant difference was found in ALT-PE. Starters accrued 36.4% of ALT-PE and non-starters accrued 28.4%, for a difference of 8.0%. A slightly significant difference was found in the not engaged-waiting category, where the starters accrued 23.9% and non-starters accrued 28.4%, for a difference of 4.5%.

Coach 2

Table 2 shows the comparison of the data from the starters and non-starters of Coach 2. No significant differences were found at the context level. Several significant differences were found at the learner involvement level. A significant difference of 5.1% was found between starters (47.2%) and non-starters (52.3%) at the not motor engaged category. The motor engaged category was also found to have a significant difference (5.1%), with the starters and non-starters accruing 52.8% and 47.7%, respectively. The most significant difference (10.7%) was found between the ALT-PE of the starters (37.2%) and non-starters (26.5%). The not engaged-waiting category also produced a significant difference (6.1%),

Table 2
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 2

ALT-PE Categories	Starters	Non-starters
General Content	1.6%	1.3%
Transition	1.0%	1.0%
Management	.0%	.0%
Break	.6%	.3%
Warm-up	.0%	.0%
Subject Knowledge	11.5%	11.5%
Technique	4.8%	4.9%
Strategy	6.7%	6.6%
Rules	.0%	.0%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	86.9%	87.2%
Practice	25.5%	25.8%
Scrimmage	61.4%	61.4%
Game	.0%	.0%
Fitness	.0%	.0%

Table 2 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	47.2%	52.3%
Interim	.3%	.4%
Waiting	29.6%	35.7%
Off-task	.0%	.0%
On-task	1.6%	1.3%
Cognitive	15.7%	14.9%
Engaged Total	52.8%	47.7%
Motor Appropriate	37.2%	26.5%
Motor Inappropriate	13.9%	18.2%
Motor Supporting	1.8%	3.0%

with the starters and non-starters accruing 29.6% and 35.7%, respectively. A slight difference of 4.3% was found between starters (13.9%) and non-starters (18.2%) in the engaged-motor inappropriate category.

Coach 3

Data from the comparison of starters and non-starters of Coach 3 are shown in Table 3. Comparison of the context level yielded no significant difference. At the learner involvement level several significant differences were found. A difference of 15.7% was found at the not motor engaged category, with the starters and non-starters accruing 40.1% and 55.8%, respectively. At the motor engaged category starters accrued 59.9% and non-starters accrued 44.2%, for a significant difference of 15.7%. The ALT-PE category showed the most significant difference (17.8%), with the starters and non-starters accruing 42.0% and 24.2%, respectively. A significant difference of 16.5% was found in not engaged-waiting between starters (22.8%) and non-starters (39.3%).

Coach 4

Table 4 shows the data from the comparison of the starters and non-starters of Coach 4. At the context level no significant differences were found. Several significant differences were discovered upon comparison of starters and non-starters at the learner involvement level. A significant difference of 10.8% was found between starters (41.5%) and non-starters (52.3%) in the not

Table 3
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 3

ALT-PE Categories	Starters	Non-starters
General Content	.9%	.9%
Transition	.9%	.9%
Management	.0%	.0%
Break	.0%	.0%
Warm-up	.0%	.0%
Subject Knowledge	10.6%	10.6%
Technique	5.0%	4.9%
Strategy	5.6%	5.7%
Rules	.0%	.0%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	88.5%	88.6%
Practice	19.7%	19.8%
Scrimmage	68.8%	68.8%
Game	.0%	.0%
Fitness	.0%	.0%

Table 3 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	40.1%	55.8%
Interim	.2%	.3%
Waiting	22.8%	39.3%
Off-task	.0%	.0%
On-task	1.0%	1.0%
Cognitive	16.1%	15.3%
Engaged Total	59.9%	44.2%
Motor Appropriate	42.0%	24.2%
Motor Inappropriate	16.8%	17.9%
Motor Supporting	1.1%	2.1%

Table 4
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 4

ALT-PE Categories	Starters	Non-starters
General Content	1.6%	1.4%
Transition	1.6%	1.4%
Management	.0%	.0%
Break	.0%	.0%
Warm-up	.0%	.0%
Subject Knowledge	7.3%	7.3%
Technique	3.1%	3.1%
Strategy	4.2%	4.2%
Rules	.0%	.0%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	91.1%	91.3%
Practice	48.6%	52.4%
Scrimmage	42.5%	38.9%
Game	.0%	.0%
Fitness	.0%	.0%

Table 4 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	41.5%	52.3%
Interim	.0%	.1%
Waiting	28.0%	40.4%
Off-task	.0%	.0%
On-task	1.6%	1.4%
Cognitive	11.9%	10.4%
Engaged Total	58.5%	47.7%
Motor Appropriate	41.9%	27.0%
Motor Inappropriate	15.3%	18.4%
Motor Supporting	1.3%	2.3%

motor engaged category. The motor engaged category yielded a significant difference of 10.8%, with the starters accruing 58.5% and the non-starters accruing 47.7%. The most significant difference (14.9%) was found in the ALT-PE category, with the starters and non-starters accruing 41.9% and 27.0%, respectively. A significant difference of 12.4% was found between starters (28.0%) and non-starters (40.4%) in the not engaged-waiting category.

Coach 5

The data from the comparison of starters and non-starters of Coach 5 are shown on Table 5. No significant difference was found in the context level. At the learner involvement level several significant differences were found. The not motor engaged category yielded a significant difference of 10.6%, with the starters and non-starters accruing 37.7% and 48.3%, respectively. In the motor engaged category the starters accrued 62.3% and the non-starters accrued 51.7%, for a significant difference of 10.6%. The greatest significant difference (14.1%) was found in the ALT-PE category in which the starters accrued 42.7% and the non-starters accrued 28.1%. In the not engaged-waiting category starters accrued 24.2% and the non-starters accrued 36.1%, for a significant difference of 11.9%.

Coach 6

Table 6 shows the data from the comparison of Coach 6's starters and non-starters. The context level yielded

Table 5
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 4.

ALT-PE Categories	Starters	Non-starters
General Content	1.3%	1.3%
Transition	1.3%	1.3%
Management	.0%	.0%
Break	.0%	.0%
Warm-up	.0%	.0%
Subject Knowledge	7.2%	7.0%
Technique	4.5%	4.3%
Strategy	2.7%	2.7%
Rules	.0%	.0%
Social Behavior	.0%	.0%
Background	.1%	.1%
Subject Motor	91.4%	91.6%
Practice	54.6%	54.7%
Scrimmage	36.8%	36.9%
Game	.0%	.0%
Fitness	.0%	.0%

Table 5 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	37.7%	48.3%
Interim	.1%	.2%
Waiting	24.2%	36.1%
Off-task	.2%	.0%
On-task	1.3%	1.4%
Cognitive	11.9%	10.5%
Engaged Total	62.3%	51.7%
Motor Appropriate	42.2%	28.1%
Motor Inappropriate	15.2%	16.5%
Motor Supporting	4.9%	7.0%

Table 6
 Comparison of ALT-PE Categories of the
 Starters and Non-starters of Coach 6

ALT-PE Categories	Starters	Non-starters
General Content	1.7%	1.7%
Transition	1.7%	1.7%
Management	.0%	.0%
Break	.0%	.0%
Warm-up	.0%	.0%
Subject Knowledge	9.7%	9.9%
Technique	3.9%	4.1%
Strategy	5.8%	5.8%
Rules	.0%	.0%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	88.6%	88.4%
Practice	35.6%	35.3%
Scrimmage	53.0%	53.1%
Game	.0%	.0%
Fitness	.0%	.0%

Table 6 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	48.4%	59.5%
Interim	.3%	.7%
Waiting	32.1%	44.3%
Off-task	.1%	.1%
On-task	1.6%	1.6%
Cognitive	14.3%	12.8%
Engaged Total	51.6%	40.5%
Motor Appropriate	37.8%	21.9%
Motor Inappropriate	13.9%	18.6%
Motor Supporting	.0%	.0%

no significant differences. The learner involvement level yielded several significant differences. A significant difference of 11.1% was found between starters (48.4%) and non-starters (59.5%) in the not motor engaged category. In the motor engaged category, starters accrued 51.6% and the non-starters accrued 40.5%, for a significant difference of 11.1%. ALT-PE yielded the greatest significant difference of 15.9%, with starters and non-starters accruing 37.8% and 21.9%, respectively. In the not engaged-waiting category starters accrued 32.1% and non-starters accrued 44.3% for a significant difference of 12.2%. A slightly significant difference of 4.7% was found in the engaged-motor inappropriate category, in which starters accrued 13.9% and non-starters accrued 18.6%.

Six Coaches Combined

The data from the comparison of starters and non-starters of the six coaches as a whole are shown in Table 7. A visual comparison of the context level yielded no significant differences. At the learner involvement level, visual comparison showed several significant differences. In the not motor engaged category starters and non-starters accrued 42.9% and 52.6%, respectively, for a significant difference of 9.7%. Starters accrued 57.1% and non-starters accrued 47.4% in the motor engaged category, for a significant difference of 9.7%. ALT-PE yielded the greatest significant difference, with starters and non-starters accruing 39.6% and 26.0%,

Table 7
 Comparison of ALT-PE Categories of the Starters and
 Non-starters of the Six Coaches Combined

ALT-PE Categories	Starters	Non-starters
General Content	1.3%	1.3%
Transition	1.3%	1.3%
Management	.0%	.0%
Break	.1%	.0%
Warm-up	.0%	.0%
Subject Knowledge	9.5%	9.5%
Technique	4.4%	4.4%
Strategy	5.0%	5.0%
Rules	.1%	.1%
Social Behavior	.0%	.0%
Background	.0%	.0%
Subject Motor	89.0%	89.1%
Practice	36.1%	36.8%
Scrimmage	52.9%	52.3%
Game	.0%	.0%
Fitness	.0%	.0%

Table 7 (continued)

ALT-PE Categories	Starters	Non-starters
Not Engaged Total	42.9%	52.6%
Interim	.1%	.3%
Waiting	26.8%	37.4%
Off-task	.0%	.0%
On-task	1.4%	1.4%
Cognitive	14.6%	13.5%
Engaged Total	57.1%	47.4%
Motor Appropriate	39.6%	26.0%
Motor Inappropriate	15.0%	18.0%
Motor Supporting	2.5%	3.4%

respectively, for a difference of 13.6%. Starters accrued 26.8% and non-starters accrued 37.4%, for a significant difference of 10.6% in the not engaged-waiting category.

Summary

Reliability of the investigator's coding was determined by those methods and procedures explained in chapter 3. IOA scores ranged from 90.7% to 100%, which was sufficient to indicate the coder was reliable.

The data presented on Tables 1 through 7 were visually compared to provide the findings for this study. Tables 1 through 6 represented the coaches individually, and Table 7 represented the coaches as a whole. Through the analysis of these data, recurrent patterns have emerged between the starters and non-starters of the coaches.

The data from the comparison of starters and non-starters at the context level yielded no significant differences for any of the coaches or for the group as a whole. No differences were found in any of the individual categories at the context level.

At the learner involvement level several significant differences were found. Significant differences were found in the not motor engaged and motor engaged categories for all coaches individually and as a whole. Starters accrued significantly higher percentages in the motor engaged category than the non-starters, whereas, the non-starters accrued significantly higher percentages in the not motor engaged category than the starters.

ALT-PE yielded the greatest significant differences for all coaches individually and as a whole. Starters accrued approximately 13.6% more ALT-PE than non-starters. In the not engaged-waiting category it was found that non-starters accrued significantly more (10.6%) than the starters for all coaches individually and for the group as a whole. Some differences were found in the engaged-motor inappropriate category, with non-starters accruing more than the starters for Coaches 2 and 6. No significant differences were found in any of the other categories.

Chapter 5

DISCUSSION OF RESULTS

This investigation compared the Academic Learning Time-Physical Education (ALT-PE) of starting and non-starting collegiate football players. This chapter will discuss the results of this study and compare the findings with those of other studies. Also, practical applications of the results from this study will be discussed.

Discussion of Results

The findings being discussed are of the differences between starting and non-starting football players of six football coaches. The findings for each individual coach are represented in Tables 1-6. Significant differences in the individual profiles of each coach were similar to the findings of the coaches combined as a single group.

Visual inspection of Table 7 revealed no significant differences in the context level of starting and non-starting collegiate football players. At the context level, no differences were found between the starters and non-starters of each individual coach (Tables 1-6). These results were predictable when one realizes that each coach dealt with his players as a single unit. Practice sessions were organized in a way that did not allow different athletes within the coach's individual group to perform different activities at the same time. The practice time was organized so that all players,

starting or non-starting, would be engaged or not engaged in the same manner. For example, when starting athletes were involved in strategy, so were the non-starting athletes. When the non-starting athletes were practicing skills, so were the starting athletes. This method of coaching employed by all the coaches accounts for the lack of context differences.

Although few differences were found at the context level, several significant differences occurred in the athletes' learner involvement levels. As a group, non-starting athletes experienced fewer opportunities to actively participate during practice sessions than the starting athletes (47.4% versus 57.1%). The non-starting athletes spent 10.6% more of their practice time waiting. This could help to explain the large difference in engaged time. During engaged time the starting athletes experienced a much greater amount of ALT-PE than the non-starting athletes (39.5% versus 26.0%). Possible practical reasons for these findings could be that the non-starters waited in line longer or they stood longer on the sideline watching their starting teammates perform drills. The findings indicated that the starting and non-starting athletes were treated differently by their coaches.

One possible explanation for the accrual of a greater amount of ALT-PE for the starting athletes could be the difference in waiting time. The non-starting athlete experienced lower levels of success (ALT-PE) and greater

amounts of waiting time than his starting counterpart. This significantly greater amount of waiting time for the non-starters could indicate that they received fewer trials during skill-related activities and, therefore, received fewer opportunities to improve their skills. This would account for the lower ALT-PE levels and engaged times for the non-starters. Another possible explanation for the higher ALT-PE of the starters could be related to the ability levels of the athletes. By definition, the starter was the athlete listed to start in the upcoming football game. It is also known that coaches try to start the best and most highly skilled athletes. If this is true, then it is logical that the starters would be more successful than the non-starters. This is supported by their higher ALT-PE levels. However, it should be noted that although the starters experienced more successful trials (ALT-PE) than the non-starters, the non-starters did not experience a significantly greater amount of motor inappropriate trials than their starting counterparts. Considering this, it would be logical to assume that the large difference in ALT-PE was not completely caused by the differences in their ability levels. It may be reasoned that the coaches had their starting athletes in mind when they designed their practices. If the coaches did gear their practice towards the starters, then the results found in Table 7 are predictable.

The revised ALT-PE observation instrument of Siedentop,

Tousignant, and Parker (1982) was utilized in this study. However, most of the ALT-PE research completed to date has used the original ALT-PE observation instrument of Siedentop, Birdwell, and Metzler (1979). The revised and original systems are similar in many ways, nevertheless, because of some changes in subdivisions and categories, direct comparisons between this study and studies using the original instrument should be made prudently.

Pieron (1982) found significant differences in the ALT-PE of high- and low-skilled students. These findings concur with the findings of the present study. Pieron suggested that the performance gap between students of different abilities was expected to widen, because high-skilled students had more opportunities to engage in more productive behaviors. It would seem to follow that the performance gap between starters and non-starters would be affected in the same manner. To reduce this gap coaches need to incorporate skill progressions that will allow the non-starters to experience more success and improve their skills to the level of the starters.

Thomas (1983) conducted a study that utilized the revised ALT-PE observation instrument to compare high- and low-skilled male and female collegiate lacrosse players. Thomas found no significant differences in the context levels of the lacrosse players. However, at the learner involvement level significant differences did exist. Thomas found that high-skilled players had more opportunity

to actively perform and were more successful and effective (ALT-PE) in performing lacrosse skills than their low-skilled teammates. He also found that low-skilled lacrosse players spent more time waiting for their turn to participate than their high-skilled counterparts. The findings of Thomas (1983) support the findings of the present study.

The results of this investigation can be compared to those of Galli (1982), who employed the ALT-PE instrument to compare a high- and low-skilled basketball player. Galli found that the high-skilled player experienced greater amounts of ALT-PE than the low-skilled player and spent less time waiting to participate. These results were in agreement with those of the present study.

Rate (1980) used the ALT-PE instrument to determine the nature of ALT-PE in secondary school athletic practice sessions of basketball, wrestling, gymnastics, tennis, and baseball teams. Rate's results indicated that approximately 90% of the practice time was spent in content-PE. The average ALT-PE across all practice sessions was 49.3%. Athletes spent 53% of their not engaged time waiting to perform. Although the revised ALT-PE system did not have a category for content-PE, the percentages obtained for subject matter knowledge and subject matter motor in this investigation may be combined to provide an estimate of the time spent in content-PE activities. Both the starters and non-starters spent approximately

98.6% of their time in content-PE or football-related activities. This was greater than the 90% reported by Rate. The average ALT-PE accrued by the athletes in this study was approximately 52.2%, which compared favorably with Rate's reported ALT-PE of 49.3%. In this investigation the time athletes spent waiting to perform was 67.1% of their not engaged time, which was greater than the 53% reported by Rate.

The Dyadic Adaptation of Cheffers' Adaptation of Flanders' Interaction Analysis System (DAC) was used by Hoffman (1981) to compare the interaction behavior patterns of collegiate lacrosse coaches with high- and low-skilled athletes. Although many similarities exist between the findings of Hoffman and the present investigation, no direct relationships can be established because of the use of different observation instruments. Hoffman found that high-skilled athletes received more attention and encouragement and initiated more responses than the low-skilled athletes. These results parallel the results of the present study in the fact that the high-skilled athletes appeared to experience more advantageous practice conditions than their low-skilled teammates. The coaches in both studies favored their high-skilled players, either through their interactions with them or through the opportunities they provided for them during practice sessions.

Boyes (1981) used DAC to investigate the interaction

patterns of collegiate football coaches with their starting and non-starting athletes. Boyes utilized the same coaching population as the current investigator, and data for both studies were collected under the same circumstances. Similar to Hoffman's (1981) findings for high- and low-skilled athletes, Boyes found that the starting athletes received more praise and acceptance of their ideas and actions than the non-starting athletes received. Unlike Hoffman's study and this present investigation, Boyes found these differences between the treatment received by the starting and non-starting athletes to be minimal.

Darst, Langsdorf, Richardson, and Krahenbuhl (1981) objectively recorded how football players spent their time during a practice session. It was assumed that the learning of physical skills necessary for football would be affected by the amount of time that players spent doing certain activities in practice, a concept similar to ALT-PE. The data indicated that the players spent large amounts of time waiting during all segments of practice except during warm-up and conditioning. This agrees with the findings of the present study, which found that waiting accounted for approximately 28.8% of practice time for the starter and 37.4% for the non-starter. Drills, plays, and physical activity represented the next most common ways that practice time was spent, except during one-on-one and scrimmage. Darst et al. found it important to point out that while it was necessary

to include all of the activities classified as unproductive (waiting, huddle time, relocating, and resting) in practice sessions, the time spent on these activities should be kept to a minimum. Darst et al. also suggested that coaches make sure players get as much active practice as possible and reduce on-the-field lecture time. They stated that practicing a skill is more effective than listening to a coach talk about a skill.

When examining the results of this study many practical applications are available for the football coach to increase the ALT-PE of their players, provide equal opportunities for their starters and non-starters, and reduce waiting time. For the remainder of this chapter these practical applications and how football coaches can utilize them during practices will be discussed.

Practical Applications

The single most important factor a coach must consider is practice organization. If a coach takes time to carefully organize his practices, waiting time can be reduced and opportunities to actively participate can be increased dramatically. When organizing practice a coach should first look at the amount of practice time with which he has to work and what he must accomplish during that time. He must make a decision as to whether he is trying to accomplish too much or too little during that time and adjust accordingly. Second, the coach should use his assistant coaches, managers, equipment,

and field space in the most effective manner to enable him to accomplish his goals. Assistant coaches should be given specific responsibilities, assignments, and field space for each practice. It should be noted that the use of equipment and field space should be discussed extensively prior to practice, so there is no confusion as to who is using the equipment and field space at what time. Confusion in this area can cause extensive waiting periods. Once the assistant coaches know their assignments for practice, they should design and plan their drills to get the most out of their players.

Designing drills is something that should not be taken lightly. Every drill should have a specific goal to be accomplished. If the drill does not have a goal or purpose, then it is a useless drill and should not be used. Drills should be designed so that as many players as possible can participate at the same time, as much as the equipment and field space will allow. This will help to increase the ALT-PE experienced by both starters and non-starters. Drills should be set up prior to the arrival of the coach and his players. Managers can be very useful in this area. If given proper instruction, managers can set up, take down, and move equipment to where the coach needs it. The effective use of managers can cut down waiting time.

The coach should urge players to move quickly from drill to drill. When a drill is completed, players should

listen and move into the next drill quickly, as the coach speaks. It is important for the coach to constantly motivate his players to move quickly from drill to drill and to keep an upbeat tempo for the practice.

Another important factor the coach should consider is to reduce on-the-field lecture time. This can be accomplished by having classroom meetings prior to each practice. During this time the coach can introduce not only the new concepts and plays but also the new drills that will be used during that day's practice. At this time the coach can also review the daily practice plan. This will help the players know and understand what is going to occur during practice. They will be able to move more quickly from drill to drill because they already know what is to be expected.

Coaches should instruct and correct their athletes as they move during practice. Individual drills, group work, or scrimmages should not be stopped to instruct one or two players. When this occurs, waiting time is increased, and active participation is decreased. A coach should either instruct the player on the move or give him individual instruction without stopping the entire practice.

Darst et al. (1981) stated that the least productive segments of practice were one-on-one and scrimmage periods. Both these periods are vital to the success of a football team, therefore, their productivity must be increased.

Waiting time can be reduced and ALT-PE can be increased during these segments with proper planning and organization. Traditionally one-on-ones have been done one player at a time. This has its benefits in that everyone else is watching, and this can provide some motivation to the player participating. However, this leads to large amounts of waiting time. If the motivational factor is not of extreme importance to the coach, all the players should do one-on-ones at the same time. This reduces waiting time to practically zero and increases ALT-PE to its maximum.

During a scrimmage segment only 22 players can participate at one time, therefore, some 30 to 40 players are waiting and watching. This number of inactive players can be effectively reduced through careful planning by the coaches. One method to help this situation is to run two units at the same time. The coach can have the number one offense scrimmage the number two defense at one end of the field and the number two offense scrimmage the number one defense at the other end of the field. Now there are 44 players actively participating and only a few waiting. Another method would be that while one offensive and defensive unit is scrimmaging the other units can be working on some aspect of the specialty game, such as punting, punt return, kickoff, etc. Then one can alternate the units so everyone scrimmages and works on the kicking game. Both these methods will increase

the ALT-PE experienced by both starters and non-starters and decrease their waiting time.

Another factor to consider is the player-to-coach ratio. The smaller the ratio the more individual instruction can be given; this in turn provides for greater ALT-PE and less waiting time. In many football programs this can be a severe problem because there are just not enough coaches. If this is a problem, the coach must work very hard to plan and organize practice in a way that will get the most out of what he has. In this researcher's opinion, careful organization and planning of daily practices are of paramount importance.

Summary

No differences were found in the context levels of starting and non-starting collegiate football players. This may be attributed to the coaching methods of the coaches. The significant differences between the starting and non-starting athletes existed at the learner involvement level. These findings led to the rejection of the null hypothesis.

There are a number of possible explanations for the findings in this investigation. The longer waiting time experienced by the non-starters may be related to their low levels of ALT-PE. The large amounts of waiting time experienced by the non-starters resulted in fewer trials and, therefore, fewer opportunities to improve their skills. It was also likely that superior ability

of the starters contributed to their being more involved and successful (ALT-PE) than the non-starters during practice.

The ALT-PE systematic observation system can be a very valuable tool in aiding the coach in using the time allocated for practice more effectively. Practical applications of the results of this investigation were discussed. Carefully organized and planned practices will help the coach to provide more opportunities for the starter and non-starter to actively participate and to reduce the waiting time.

The findings of this study concur with the findings of other researchers (Galli, 1982; Hoffman, 1981; Pieron, 1982; Rate, 1980; Thomas, 1983). The results of this investigation supported the contention that coaches tend to treat their athletes differently according to their starting or non-starting status.

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Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The purpose of this investigation was to observe the Academic Learning Time-Physical Education (ALT-PE) of starting and non-starting collegiate football players. Six Division III collegiate varsity football coaches from a single school in the central New York area and their athletes served as subjects. Each coach was videotaped 18 times during practice throughout the 1981 football season, each time for 15 minutes. Target athletes were selected weekly based on the status of the athlete as a starter or non-starter in the upcoming football game. The videotapes of the practice sessions were coded using the revised Academic Learning Time-Physical Education observation instrument of Siedentop, Tousignant, and Parker (1982).

The ALT-PE data were manually scored, and percentages were calculated for each ALT-PE category. Only descriptive statistics were used to analyze the data.

Visual inspection of the data revealed several significant differences between the starters and non-starters. No differences were found at the context level. At the learner involvement level it was found that non-starters accrued more time in the not motor engaged category than the starters. Further inspection of the

not motor engaged category showed that the not motor engaged-waiting category was the only individual category to yield a significant difference. Non-starters accrued a much greater percentage of time in the not motor engaged-waiting category than the starters. The motor engaged category was also found to yield significant differences, with the starters accruing a greater percentage of time than the non-starters. The greatest difference was found in the ALT-PE category, with the starters accruing approximately 13% more time in ALT-PE than the non-starters. No differences were found in any other categories.

Conclusions

The results of this study indicated significant differences in the ALT-PE categories between the starters and non-starters of six NCAA Division III football coaches. The following conclusions were reached:

1. Starters and non-starters accrued the same amount of time in all the context level categories.
2. Non-starters accrued more time in not motor engaged activities than starters.
3. Starters accrued more time in motor engaged activities than non-starters.
4. Non-starters spent more time waiting than starters.
5. Starters were provided more time to engage in ALT-PE than non-starters.

Recommendations for Further Study

The following recommendations are suggested for further study:

1. Conduct a similar study to determine if the ALT-PE of starting and non-starting collegiate football players alters during the course of a season.
2. Conduct a similar study with starting and non-starting athletes from a collegiate sport other than football, for example, soccer, baseball, wrestling.
3. Conduct a similar study to determine if the players of successful and less successful coaches have different amounts of ALT-PE in practice.
4. Conduct a similar study with coaches from different levels of competition, for example, NCAA Division I, high school.

Appendix A
INFORMED CONSENT FORM
COACH'S COPY

The purpose of this investigation is to observe the Academic Learning Time-Physical Education (ALT-PE) of starting and non-starting collegiate football players. ALT-PE is that portion of practice that the football players spend in motor activity that is appropriate for their skill level.

The subjects are six male collegiate varsity football coaches at a small college in central New York. Permission is being requested of the coaches involved in the study to use videotapes of practices collected during the 1981 football season. A number of tapes will be randomly selected from each coach to be analyzed using the Academic Learning Time-Physical Education (ALT-PE) observation instrument.

It is assured that the names of the subjects used for this study will be kept strictly confidential. The videotapes used in this study will be available at the discretion of the subjects involved. The findings of the researcher will be available to the subjects upon request. All subjects are allowed the freedom to discontinue their participation should they feel the need.

Thank you. The researcher: Paul R. Shaffner.

_____ Yes, I agree to participate in this study.

_____ No, I will not agree to participate in this study.

Signature

Date

Appendix B
INFORMED CONSENT FORM
ATHLETE'S COPY

The study in which you are asked to participate is the observing of the Academic Learning Time-Physical Education (ALT-PE) of collegiate football players. ALT-PE is that portion of practice that the football players spend in motor activity that is appropriate for their skill level.

Permission is being requested of the athletes involved in the study to use videotapes of practices collected during the 1981 football season. A number of tapes will be randomly selected from the football season to be analyzed using the Academic Learning Time-Physical Education (ALT-PE) observation instrument. The videotaping will in no way interfere with your normal actions.

It is assured that the names in this study will be kept strictly confidential. The videotapes used in this study will be available at the discretion of the subjects involved. The findings of the researcher will be available to the subjects upon request. All subjects are allowed the freedom to discontinue their participation should they feel the need.

Thank you. The researcher: Paul R. Shaffner.

Yes, I agree to participate in this study.

No, I will not agree to participate in this study.

Signature

Date

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