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A comparison of the academic learning time of a high-skilled basketball player and a low-skilled basketball player

George Louis Galli Jr.
Ithaca College

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A COMPARISON OF THE ACADEMIC LEARNING TIME
OF A HIGH-SKILLED BASKETBALL PLAYER AND
A LOW-SKILLED BASKETBALL PLAYER

by

George Louis Galli, Jr.

An Abstract

of a project 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 1982

Project 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 a high-skilled male basketball player and a low-skilled male basketball player. One male secondary basketball coach and a high-skilled player and a low-skilled player from the Central New York area served as subjects. Prior to the first game, the coach identified his players as either high- or low-skilled. The top 33% were designated as high-skilled and the bottom 33% were labeled low-skilled. A player from each group was chosen randomly to serve as subjects. A videotape recorder with a wireless microphone was used to collect data on 20 practice sessions, which were divided into four separate phases. During Phase One, each athlete was videotaped for five practice sessions before the first game of the season. Phase Two and Three involved five videotaped practices each, with five videotaped practices following wins and five following losses. Phase Four consisted of five videotaped practice sessions after the last regular season game. The videotapes were coded by the investigator using the Academic Learning Time-Physical Education instrument (Siedentop, Birdwell, & Metzler, 1979). Visual analysis of the data was used to determine differences in the ALT-PE categories and in ALT-PE-M. Noticeable differences between the two players within each phase, between phases, and for all phases led to the rejection of the null hypothesis which stated there would be no noticeable differences in the ALT-PE of a high-skilled basketball player and a low-skilled basketball player. The high-skilled player exhibited greater success in game and skill activities, was more actively involved in motor and cognitive situations, and was found to have greater involvement in

game situations. The low-skilled player spent a greater time inactively waiting to participate and received more directions and knowledge from the coach. The total accumulation of the four phases also revealed no obvious differences in setting or content-general categories and showed that the high-skilled player and the low-skilled player spent over 85% of their practice time in content-PE. There was no difference between the two players in the amount of time spent engaged at an easy level of difficulty which involved motor responses only (ALT-PE-M).

A COMPARISON OF THE ACADEMIC LEARNING TIME
OF A HIGH-SKILLED BASKETBALL PLAYER AND
A LOW-SKILLED BASKETBALL PLAYER

A Project 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
George Louis Galli, Jr.
September 1982

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

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE PROJECT

This is to certify that the Master of Science Project of

George Louis Galli, Jr.

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 has been approved.

Project Advisor:

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Date:

Aug. 30, 1982

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Chapter 1

INTRODUCTION

Although the value of N=1 and small group experiments have been recognized, very few experiments on teaching behavior in recent years have been based on the study of only one subject (Edgington, 1967). Traditionally, investigations concerning coaching and/or teaching behavior have focused on large group studies. The most common complaint about N=1 designs has been their inability to generalize over individuals (Dukes, 1965; Edgington, 1967). However, Guralnick (1978) suggested generalization may, in fact, be more readily made from N=1 studies than from large group studies due to the opportunity for more accurate delineation and precise control of relevant subject characteristics. Increasingly, investigators have found that large group research models cannot answer all of their research questions (Frey, 1978). The disparity between important questions and the sense that present tools no longer work in all cases have caused some to explore the usefulness of other research paradigms such as N=1 and small group designs. For this reason small group and N=1 studies should be used to observe teacher and/or coach behaviors.

Past investigations that studied small group and single subject designs have incorporated a longitudinal approach. Longitudinal approaches in N=1 behavior studies have been utilized to observe an individual or group of individuals over a length of time. If single subject designs are to be effective, they must contain longitudinal data from each of several phases, such as the introduction, middle, and

conclusion of a unit (Walton, 1972). Rigorous description of the process, especially during intervention phases, and conceptualization and theorizing about the process itself are important (Walton, 1972). Longitudinal studies have traditionally taken place over a period of years in order to ensure that all phases were observed. However, Sontag (1971) states that in teaching, a relatively short period of time, not years, may be of sufficient length to study all phases.

Most of the N=1 studies between 1939 and 1963 were performed in the field of psychology (motivation, maturation and development, emotion, perception and sensory processes, learning, thinking and language, intelligence, personality and mental health, and psychotherapy). Yet, until recently little or no N=1 studies have been performed in the field of education/teacher education.

While few have studied teacher behavior in an N=1 style, fewer have attempted research in physical education and coaching realms. This may be due to the fact that there are few instruments designed to describe the behavior of individuals and small groups in these realms. Although descriptive analytic instruments such as Cheffers' Adaptation of the Flanders' Interaction Analysis System--CAFIAS (Cheffers, 1972), Behavior of Students in Physical Education--BESTPED (Laubach, 1974), the Coaching Behavior Assessment System--CBAS (Smith, Smoll, and Hunt, 1977), and the Physical Education Observation Schedule--PEOS (Adler, 1972) have systematically observed physical education and coaching settings in large groups, their application to small group investigations has been limited. Researchers are gradually changing this situation.

Among the most influential investigation to date have been the series of studies conducted at the Far West Laboratory for Educational

Research and Development in San Francisco. These studies comprised the Beginning Teacher Evaluation Study (BTES) which concentrated on a process variable. The process variable studied was referred to as time on task and was studied in elementary math and reading classrooms (Berliner, 1976; Fisher, 1978; Marliave, 1977). The initial investigations produced a concept of Academic Learning Time (ALT) which was defined as the amount of time a student spends engaged in an academic task that the student can perform with success. ALT was shown to have a strong correlation with student achievement in math and reading (Fisher, 1978). The strong relationship which has been established between time on task and student achievement adds support to the use of ALT as a dependent variable (Borg, 1979).

At Ohio State University, the ALT model has been incorporated recently into teaching research programs in physical education. Siedentop, Birdwell, and Metzler (1979) modified ALT to develop an observational system, Academic Learning Time-Physical Education (ALT-PE), which was more sensitive to the characteristics of the physical education setting.

Several researchers (Aufderheide, Knowles, & McKenzie, 1980; Metzler, 1979, 1980; Shute, Dodds, Placek, Silverman, & Rife, 1982) have used ALT-PE in a variety of physical education settings. Rate (1980) was the first researcher to use ALT-PE in an interscholastic environment to study athletes. Rate's investigation is one of the few small group studies conducted using ALT-PE in an interscholastic environment. The interscholastic program has been one area of the school physical education program that has been neglected in research.

For this reason, it was the contention of the investigator that small

group or N=1 designs be utilized in coaching studies.

Scope of Problem

The purpose of this study was to determine differences in the Academic Learning Time-Physical Education (ALT-PE) of a male secondary basketball player with high skill ability and a male secondary basketball player with low skill ability during practice sessions at a school in the Central New York area.

A single male secondary head varsity basketball coach and a male secondary varsity basketball team were studied. Prior to the first game, the coach identified his basketball players as either high-skilled or low-skilled. A high-skilled and low-skilled group were to serve as subjects.

Data were collected for four phases during the 1980-81 basketball season, through the use of videotape. Phase One involved videotaping five practice sessions prior to the first game of the season. Phase Two involved videotaping the practice session after five wins while Phase Three involved videotaping the practice session following a loss for five losses. Phase Four concluded with five practices in preparation for postseason tournament competition. The videotaping of practice sessions varied from $1\frac{1}{2}$ to 2 hours in length. The coding of each practice session was limited to 18 minutes per athlete on an alternating interval basis (i.e., observe one...record one...observe two...record two...observe one..., etc.). The observation instrument used in this study was ALT-PE (Siedentop et al., 1979).

Statement of Problem

It was the purpose of this study to determine any differences in the ALT-PE of a male secondary high-skilled basketball player and a male

secondary low-skilled basketball player.

Null Hypothesis

There will be no difference in the ALT-PE of a male basketball player with high skill ability and a male basketball player of low skill ability.

Assumptions of Study

For the purpose of this study, the following assumptions were made:

1. The athletes' and coach's behaviors were observable and measureable.
2. The 20 tapings for coding were representative of the total basketball season.
3. The interval recording technique of the ALT-PE instrument and the time sampling technique used for observing coaching behavior provided a representative sample of the behavior which would have been obtained from continuous observation.
4. The coach's and athletes' behaviors were not affected unduly by the presence of an observer at the practice sessions.
5. The ALT-PE instrument provided a valid and accurate view of the learning environment in athletic settings.
6. The investigator was reliable in the use of ALT-PE.

Definition of Terms

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

1. Academic Learning Time-Physical Education (ALT-PE) is the amount of Academic Learning Time (ALT) that an athlete accrues while involved in physical education or sport specific content (Metzler, 1979) (Appendix C).
2. High-skilled Player is any player whose skill ability, as

identified by his coach, ranks him in the top 33% of the team.

3. Low-skilled Player is a player whose skill ability, as identified by his coach, ranks him in the bottom 33% of the team.

4. Secondary Coach is a certified educator that coaches athletes on the secondary school level (grades 7-12).

5. Phase One refers to the five videotaped practice sessions before the first game.

6. Phase Two refers to the five videotaped practices following wins.

7. Phase Three refers to the five videotaped practices following losses.

8. Phase Four refers to the five videotaped practices following the last regular season game and before the first postseason game.

Delimitations of Study

The following were the delimitations of the study:

1. Only a male secondary head coach and his varsity basketball players participated in the investigation.

2. This study utilized ALT-PE as the only observational technique to compare the ALT-PE of a high-skilled basketball player to the ALT-PE of a low-skilled basketball player.

3. The coach and athletes involved were from the Central New York area.

Limitations of Study

1. The school and team included for observation were chosen on the basis of convenience and coach's approval.

2. Only two subjects (athletes) were observed in each practice session.

3. Practice sessions varied in length from $1\frac{1}{2}$ to 2 hours. The coding of each practice session was limited to 18 minutes per athlete.

4. The results may only hold true if ALT-PE is used as the observational technique.

Chapter 2

REVIEW OF RELATED LITERATURE

This study compared the Academic Learning Time-Physical Education (ALT-PE) of two varsity male secondary basketball players of different skill abilities. The review of related literature is divided into five sections. The first section describes systematic observation systems in physical education. The second section identifies small group and N=1 studies in physical education and coaching, while the third section focuses on systematic observations of coaching. The fourth section describes the Beginning Teacher Evaluation Studies. The final section focuses on studies involving the ALT-PE instrument (Siedentop, Birdwell, & Metzler, 1979) in physical education settings.

Systematic Observation in Physical Education

During the past decade, a number of observational systems have been developed specifically for the physical education environment. The vast majority of these systems have evolved from the Flanders' Interaction Analysis System (FIAS) designed by Flanders in 1960. Studies by Cheffers (1972), Dougherty (1971), Kurth (1969), Mancuso (1972), Melograno (1972), Nygaard (1975), and Tavecchio, Splinter, Kemper, Koos, Snel, and Verschuur (1977) used modifications of Flanders' system to investigate a wide range of physical activities.

In 1969, Kurth investigated teacher-student behavior in elementary physical education classes. Student teachers were observed. Kurth concluded that FIAS was incomplete in the analysis of physical education classes because it did not provide for nonverbal, moment to moment

behaviors.

In 1971, Dougherty added to FIAS a nonverbal meaningful movement category and a provision for identifying teacher verbal communication directed toward an individual and a group. Melograno (1972) modified FIAS with the addition of an "n" next to the corresponding verbal behavior category when nonverbal communication was also taking place.

In 1975 FIAS was used by Nygaard to investigate the verbal behavior of teachers and students in 40 elementary, secondary, and college level classes. He concluded that the predominant teacher behavior pattern was one of extended lecturing, which in turn limited student participation.

The most extensive and refined adaptation of FIAS for use in the physical education settings was made by Cheffers (1972). Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) identified verbal and nonverbal interaction, teaching agents, and the structure of the activity session. Other advantages of CAFIAS include its ability to distinguish between harsh criticism and constructive criticism and between silence and confusion.

Finally, Tavecchio et al. (1977) produced the Physical Education Interaction Analysis System (PEIAS). Unlike CAFIAS, emphasis was placed on verbal categories but some nonverbal categories were included. PEIAS consisted of 17 categories compared to the 10 of FIAS. The system concentrated on the measurement of directive and nondirective aspects of teaching behavior.

Paralleling the development of FIAS modifications in physical education were a series of relatively unrelated instruments. Barrett (1977) developed a system to describe teacher-student behavior in movement education classes at the elementary level. Unfortunately, the

interobserver agreement was not considered adequate and further refinement of the system was recommended.

Anderson (1971) and his associates collected 83 videotapes of physical education classes from 60 schools in three states. The descriptive analysis of these tapes resulted in various observational instruments designed specifically for the physical education classroom. One system developed was the Occurrence of Physical Activities which measured the occurrence of each activity in class. Fishman (1975) created an instrument designed to measure the feedback teachers gave to students while teaching a skill. Laubach (1974) developed a system to isolate individual students and observe them. Laubach's system, Behavior of Students in Physical Education (BESTPED), coded (a) mode, (b) function, (c) content, and (d) time. Used in elementary school physical education classes by Costello in 1977, Laubach's instrument found that 48.8% of students' time in physical education was spent in nonsubstantive activity.

The Teacher's Role in the Learning Activity Selection Process (TRI-LASP) was developed by Hurwitz (1975). This system described the role of the teacher in selecting student activities. The teacher's role was identified by responses ranging from "director" to "no role at all."

Adler (1972) designed the Physical Education Observation Schedule (PEOS) to explore the dimension of inclusion-exclusion in physical education classes for grades 7-12. Adler concluded that teacher behaviors in classes which were identified as high in inclusion differed from those behaviors exhibited in classes high in exclusion.

The Ohio State University Teacher Behavior Rating Scale was developed by Siedentop and Hughley (1975). The system consisted of eight categories concerning descriptive data on the teaching behavior of

physical educators. It has been used to modify student teacher behavior in a few studies (Cramer, 1978; Hutslar, 1976; Stewart, 1977).

Studies which used systematic observation instruments that were particularly relevant to this study were conducted by Stewart (1977), Quarterman (1978), and Freedman (1979). Stewart (1977) observed teacher and student behaviors in physical education classes at the elementary, junior and senior high school levels. Twelve teachers were observed for an entire period on three different occasions. The observational instrument was developed specifically for the study. Included in the observational instrument were 25 teacher behavior and four climate categories. Observations were made on an interval basis. One part of the analysis of data showed results in four categories: management, instruction, waiting, and activity. With the results taken across all subjects the data, reported in percentages of class time, were as follows: management, 25.9%; instruction, 10.3%; waiting, 2.1%; and activity, 61.7%. These categories were similar to the categories employed in the ALT-PE instrument.

Quarterman (1978) studied the participation and class behavior of elementary school children and the behaviors of 24 physical education teachers. Quarterman's results, reported in percentage of class time, were as follows: management, 34%; implementation, 12%; and participation, 54%. Freedman's (1979) study modified Stewart's Observation Recording Record. Freedman's system, Teacher Observed System (TOS), used a 10-second interval recording system to describe teacher behaviors. Other modifications were made to the behavior categories of TOS so that coaching activities could be investigated.

Small Group and N=1 Studies in Physical
Education and Coaching

Investigations using the small groups and N=1 in coaching and physical education have grown gradually in the 1970's. Many of these small group and N=1 studies in physical education and coaching have been conducted at Ohio State University (OSU). Hughley (1973) examined the effects of direct information feedback on teaching behaviors of student teachers in physical education. Four subjects majoring in physical education at OSU were chosen to participate in the study. A teacher rating scale was developed. The scale was partially based on the Behavior Observation Schedule for Pupils and Teachers (Breyer & Colchera, 1971) and Bellack's (1967) behavior categories. The investigator concluded that direct information feedback, when given on specific behaviors, can effect changes in a physical education student teacher. However, two of the four student teachers found the regular presence of the observer inhibiting and felt that videotape or peer observers would have eased the pressure placed upon them by the presence of the observer.

Boehm (1975) investigated the effects of a competency-based form of student teaching at the junior high level with eight OSU physical education majors. An observational system was developed by the cooperating teacher and the investigator which recorded specific student teacher and pupil behaviors. A multiple baseline design was used to compare behavior rates, behavior percentages, and management time during baseline and intervention. The results of the study indicated feedback, goal setting, cueing, and reinforcement were effective methods in changing rates of specific behavior in physical education student teachers.

The existing high levels of appropriate pupil behaviors were maintained throughout the study.

Darst's study, in 1974, investigated the effects of a competency-based intervention on the behaviors of seven student teachers at the elementary level. A multiple baseline design was used to analyze the data. He concluded that the observation system that was developed from a competency-based format exerted a measure of accountable control over the behaviors of the seven student teachers and the behaviors of their classes which were observed.

Dodds (1975) examined the effects of a peer assessment model for student teacher supervision on the acquisition and maintenance of designated teacher behaviors. The primary intervention strategy for modifying the four target subjects' behavior was a series of seven competency-based modules. Dodds concluded that student teachers demonstrated satisfactory criterion levels in planning elementary physical education and that the behavior analysis intervention technique was viable.

Hutslar (1976) investigated the effects of a training program for cooperating teachers on the performance of student teachers in an elementary school physical education setting. Six subjects participated in the study that used multiple baseline design to analyze selected behaviors of the student teachers. An additional six student teachers were utilized as a control group. The results indicated student teachers in the experimental group perceived their elementary teaching experience was significantly better than their secondary experience, and cooperating teachers found the experimental method of supervision to be superior to the regular method.

In 1978, Cramer analyzed the effects of training cooperating teachers in applied behavior analysis on the performance of selected teacher behaviors of student teachers in a secondary school physical education setting. Five secondary school physical education teachers participated in the study. Each cooperating teacher was involved in a 6-week training program prior to working with the student teacher. Throughout the study, cooperating teachers observed and recorded data for the student teacher in one class per day for the duration of the student teaching experience. The investigator concluded that cooperating teachers were able to use applied behavior analysis techniques successfully in changing selected teacher behaviors of their student teachers.

A small group study not conducted at OSU was by Stevens (1979) at Ithaca College. The investigator examined the effects of instruction and supervision in Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) on the teaching behavior of elementary physical educators. Four certified elementary physical educators, two male and two female, were selected from the Central New York area. Subjects were randomly assigned to a treatment group (N=2) and a control group (N=2). Both groups were observed by the investigator once a day for 20 consecutive days while teaching an entire physical education class. The subjects in the control group were videotaped and received conventional supervisory feedback after videotapings. The subjects in the treatment group received instruction in CAFIAS and were given computer print-outs depicting the teacher-pupil interactions. The investigator concluded that treatment group classes were characterized by increased student involvement; increased teacher verbal and nonverbal praise, acceptance and use of

questions; and less teacher information giving, directions, and criticism. The control group exhibited less verbal student predictable behavior and increased nonverbal student predictable behavior.

Reisenweaver (1980) and Streeter (1980) employed the Dyadic Adaptation of Cheffers' Adaptation of Flanders' Interaction Analysis System (DAC) and compared the teaching behavior patterns of secondary physical education teachers in their interactions with high-skilled and low-skilled students. Similar results from Reisenweaver (1980) and Streeter (1980) indicated a significant difference between the behavior patterns of secondary physical education teachers as they interacted with the high-skilled students compared to their interactions with the low-skilled students. Interaction with the high-skilled group showed significantly more acceptance of student ideas and actions, teacher praise, use of questions, and information-giving, while interaction with low-skilled students showed significantly more teacher direction, criticism, and response.

Only a handful of researchers have conducted small group studies in physical education; fewer have attempted to study coaches. Bain (1978), Kasson (1975), Langsdorf (1980), Mertler (1974), and Tharp and Gallimore (1976) represent those who have investigated coaching behavior through small group studies.

Bain (1978) used independent teachers and coaches in a study which compared teaching and coaching behaviors. Sex differences were also investigated. One male and one female teacher and coach were selected as subjects from 10 randomly selected public secondary schools in Houston, Texas. Male coaches coached basketball, and females coached volleyball while the teachers taught sport activities. Each natural unit

of verbal behavior was categorized according to form, affective components, target, and content. Bain (1978) observed:

1. Behaviors exhibited by physical educators in a classroom situation differed from those exhibited in an athletic setting.
2. Athletic team practices were focused on the attainment of skilled performance.
3. Coaches emitted a higher percentage of substantive comments and used more praise and criticism in their responses to students.

In a study completed by Kasson (1975) at the University of Wisconsin, teacher/coach behaviors in physical education classes and athletic practice sessions were compared. The subjects of the study were three male physical education instructors who taught advanced skill level classes and who also served as head varsity coaches for baseball, gymnastics, and wrestling. Mancuso's (1972) Adaptation for Verbal and Nonverbal Behavior System was the recording instrument used. The results in athletic practice sessions indicated 56% of the coaching behavior exhibited was direct, and the teacher/coach determined the guidelines of teaching/coaching sessions; 25% of the coaching behavior was nonverbal, 37% verbal; and 38% was silence.

Using modifications of the Ohio State University Teacher Behavior Rating Scale, Mertler (1974) used an N=1 approach to look at a female basketball coach's behavior to see if it could be modified. The investigator also attempted to offer evidence as to whether the changes in her repertoire of behaviors would affect a spectrum of behaviors in her junior college basketball players. This study was divided into two phases. The first phase consisted of interventions on the target behaviors of the coach and continued recording of the performers'

behavior. The performers' behavior was observed and recorded to identify a change in behavior. In Phase II the coach was made aware of the targeted players' behaviors that had not been affected in the first phase and used newly modified behavior to specifically change performers' behavior. Mertler (1974) concluded applied behavioral analysis techniques could be used to modify coach's and players' behaviors. Also, general changes in the coach's behavior did not affect a change in players' behaviors.

Tharp and Gallimore (1976) used an N=1 design and developed a 10-category descriptive-analytic system to describe 15 practice sessions with John Wooden at UCLA. They hypothesized that a study of a successful coach could provide keys to successful learning. Over 90% interobserver reliability was achieved after several weeks of pilot observation before the first of the 15 researchers' practice sessions began. The categories and results reported in terms of the total number of behaviors were instructions, 50%; hustles, 13%; modeling-positive, 3%; modeling-negative, 2%; praises, 7%; scolds, 7%; nonverbal reward, 10%; scold/reinstruction, 8%; nonverbal punishment, 0%; other, 2%; and uncodable, 7%. The results identified 75% of Wooden's behaviors as carrying information.

Langsdorf (1980) used an N=1 and observed the coaching behavior of a highly successful football coach. Ten verbal and four nonverbal coaching behaviors were recorded over 18 practice sessions. The behavior categories included instruction, hustle, praise, nonverbal reward, scold, nonverbal punishment, scold/reinstruction, modeling-positive, modeling-negative, first name use, coach interaction, questioning, other, and uncodable. The data were compared to Tharp and Gallimore's (1976) study. The investigator concluded that there were significant similarities in the behavior of the two coaches.

Systematic Observations of Coaching

With the exception of the past 10 years, there has been little research that has utilized systematic observation to observe coaching. This section of the review of literature focuses on various studies which have used systematic observations to describe or to measure changes in coaching behavior.

Smith, Smoll, and Hunt (1977) trained observers to use the Coaching Behavior Assessment System (CBAS). CBAS categorizes behavior into two categories--spontaneous behavior (initiated by the coach in the absence of an antecedent) and reactive behavior (response to immediately preceding events). Their results indicated observers can be trained to use the CBAS and the instrument has its greatest use in sports such as baseball where the game development is relatively predictable, and the source of interaction can be identified. The use of the CBAS in sports such as soccer, basketball, and hockey was difficult because the observer had difficulty in identifying the event to which the coach was responding.

Several studies on coaching behavior which used CAFIAS as the observation instrument have been conducted at Ithaca College under the guidance of Dr. Victor Mancini on coaching behavior.

Agnew (1977) looked at the behavioral patterns of females who taught physical education and coached in order to identify any differences between individuals when they were coaching as compared to when they were teaching. The investigator videotaped 20 subjects during 30-minute segments of their teaching and coaching sessions. Their results showed significant differences with a greater variety of behaviors exhibited in a coaching setting and fairly direct behavior exhibited in the teacher

setting.

Barr (1978) used 20 secondary team sport coaches in her study and investigated the effect of interaction analysis training (IA) on coaching behavior. The results indicated significant differences existed between the experimental group of coaches who were trained in IA and the control group who received no training. The experimental group elicited more questions, acceptance, and praise both verbally and nonverbally than the control group. The study also showed group differences on the teacher suggested pupil nonverbal initiation which was a contradiction to Agnew's findings.

Avery (1978) investigated the differences in coaching behaviors of more and less effective high school coaches during practice sessions. Coaches were videotaped and tapes coded using CAFIAS. Coaches were classified into more or less effective using the Coaches' Performance Criteria Questionnaire (CPCQ). Significant differences between more effective and less effective coaches were found. Teacher use of acceptance and praise (verbal) was the greatest contributor to between group differences. Rotsko's (1979) study was similar to Avery's (1978) but was restricted to male coaches of 10 varsity teams. Successful coaches used more verbal and nonverbal praise, whereas the less successful coaches used more verbal criticism.

Studies by Hirsch (1978), Proulx (1979), and Staurowsky (1979) have used similar research techniques and samples. Hirsch, Proulx, and Staurowsky looked at teams categorized on the Group Environment Scale as satisfied or not satisfied with their social climate. Significant differences on CAFIAS variables were found between the coaches of teams in the two groups.

Beginning Teacher Evaluation Studies

The Beginning Teacher Evaluation Studies (BTES) focused approaches to measure teacher effectiveness (Marliave, 1977). This paradigm became popular and prominent in the early 1970's. However, researchers were convinced that it was unrealistic to expect teacher processes at the time of instruction to influence student achievement directly on test items given months later. Berliner (1976) recommended substitution of the correlation approach in process-product studies. A compromise developed by Fisher (1978) acknowledged student achievement as a viable indicator of learning but suggested that there were on-going observable measures of learning which were more direct and immediate. The amount of time spent engaged in academic material which produced a high rate of success was chosen as the observable measure; this was termed Academic Learning Time (ALT). The investigator concluded that the proportion of time students are engaged at high success rate is positively associated with student learning (Fisher, 1978).

The Far West Laboratory conducted BTES research in three phases. Phase I, the planning phase, was initiated in 1972-73. Phase II followed in 1973-74 with the development of an instrument and hypothesis for further study. During 1974-78, field studies were conducted using a variety of instruments developed in the earlier phase. The subjects involved were 139 second grade and 122 fifth grade students. All were observed for an entire day, once a week throughout that period. The results reported by Fisher (1978) indicated a strong relationship between the amount of time students were engaged at a high success level and learning.

Marliave (1977) reported the major strength of ALT was its focus

on individual students and their continual behaviors. The researcher concluded that the absence of ALT restricted learning with engagement rate and error rate as possible causes.

Studies Involving ALT-PE

In an effort to apply the BTES findings and to use ALT in the physical education realm, Siedentop, Birdwell, and Metzler (1979) created an instrument to measure ALT in physical education settings. Since its inception, both descriptive-analytic and experimental studies have used the ALT-PE instrument.

Metzler (1979) measured the amount of ALT-PE accrued by students in a variety of physical education settings. The study involved 33 classes divided evenly into elementary, junior high, and senior high. Classes were observed three to seven times each. Fourteen different physical education activities were included in the observations. Coder interobserver reliability was insured through a rigorous training. Interobserver reliability was required to reach a criterion level before coding was allowed. Descriptive statistics were used to analyze each level of the instrument, allocated time, ALT-PE and ALT-PE-M. He concluded that direct and task categories accounted for 99% of the time in setting. He found 75% of the time devoted to content was spent on physical education activities. Also elementary students were engaged 11.8% more than secondary students.

Metzler (1980) examined the same data to determine physical activity focus. Thirteen different activities were observed, but only five were observed in more than one educational level which made comparisons difficult. However, the amount of ALT-PE observed and recorded as ALT-PE-M averaged 7.5%. The range was 24% for games at the elementary

level to 3% for junior and senior high school tennis classes.

Shute, Dodds, Placek, Silverman, and Rife (1982) investigated ALT-PE in a movement education class. ALT-PE was the instrument used to measure student behaviors in elementary physical education classes of a first year teacher. Although no statistical analysis of the results was performed, the investigators concluded that no significant differences in ALT-PE existed. The 6- and 7-year old group had an ALT-PE figure of 41%, whereas 8- and 9-year olds had 34.3%, and 10-12 years had 28.9%. The total ALT-PE was 36% of the total setting intervals observed; only 20% of the intervals in the learner move level were engaged and motor.

At the University of Texas, Aufderheide, Knowles, & McKenzie (1980) compared the ALT-PE of mainstreamed handicapped and regular students. The study included 60 regular and 60 mainstreamed handicapped students in elementary school physical education classes. After teachers were classified as users or nonusers of individualized instruction in mainstreamed classes, one handicapped and one regular student were observed alternately using the ALT-PE instrument. Analysis of variance was used in data analysis. It was shown that students within the classes of users of individualized instruction were engaged in a significantly greater amount of ALT-PE than were the students of nonusers. There were no significant differences in the amount of ALT-PE engaged in by mainstreamed handicapped and regular students.

McKenzie (1980) conducted a second study to look at the variability in ALT-PE within and between beginning 5-7 year old swimmers, the effects of publically posting skill achievement on the ALT-PE of the swimmers, and the effect of 1-minute time-out contingencies on disruptive behavior and ALT-PE of young swimmers. The subjects were subdivided into high,

medium, and low skill levels on the basis of a pretest. In each of the two classes, one child was selected from each subgroup for observation. Two subjects who exhibited high levels of disruptive behavior were selected from the third class. McKenzie found that the ALT-PE increased for half of the subjects as a result of the skill achievement postings and that disruptive behavior could be reduced by the contingency program.

Whaley (1980) from Ohio State University conducted the first intervention study that evaluated the effects of daily monitoring and feedback on ALT-PE. The subjects were three students from three high schools and one middle school physical education classes in the Columbus, Ohio school system. The investigator used a multiple baseline design with the ALT-PE recorded for each day for 6 weeks. The intervention consisted of daily feedback to the teacher about the content-physical education, engaged time, motor response time, ALT-PE, and ALT-PE-M. The second intervention was directed at students who were presented with daily postings of the percent of intervals of motor response for the class. The major conclusion was that daily monitoring and feedback had no effect on any of the dependent variables measured.

Rate's (1980) descriptive-analytic study was the first from Ohio State University to use ALT-PE in an interscholastic environment. The investigator compared the ALT-PE of various secondary interscholastic teams. The teams observed were basketball, wrestling, girls' gymnastics, boys' tennis, and baseball.

Rate slightly modified the ALT-PE instrument with the addition of a fifth level identifying coach behavior. The investigator concluded that instruction was conducted in two styles only--direct and task, and 75% of instruction was direct. One of Rate's recommendations was to study

the ALT-PE of athletes of different ability levels within the one athletic setting to determine if there were significant ALT-PE differences.

The purpose of this investigation is to follow through with the above recommendation by comparing the ALT-PE of a high-skilled and low-skilled basketball player.

Summary

This chapter examined the literature relevant to the systematic observation of the behaviors of the teacher, the coach, and the student in physical education. A number of instruments were identified, and some of the research conducted using the instruments was discussed.

There has been an increase recently in the application of systematic observations to research the teaching of physical education and its allied areas by utilizing an N=1 or small group approach. At Ohio State University, numerous researchers have used small group designs to observe subjects in a physical education setting (Boehm, 1975; Cramer, 1978; Dessecker, 1976; Hughley, 1973). Others have observed small groups in the coaching environment (Bain, 1978; Kasson, 1975; Mertler, 1974; Tharp & Gallimore, 1976). In some instances researchers have developed their own instrument if an existing instrument was not adequate for their study.

ALT-PE has been designed to utilize the N=1 and small group approach. While few studies have attempted to use ALT-PE in a physical education setting (Aufderheide, Knowles, & McKenzie, 1980; Metzler, 1979; Shute, Dodds, Placek, Silverman, & Rife, 1982; Whaley, 1980), none have compared the ALT-PE of athletes of different ability levels within the one athletic setting. In fact, the only ALT-PE study reported to have studied subjects in the athletic environment was conducted by Rate (1980). The next sequential step in the use of ALT-PE to study athletes is to compare the

ALT-PE of a high-skilled player and a low-skilled player in the same athletic setting.

Chapter 3

METHODS AND PROCEDURES

This chapter outlines the methods and instruments used in gathering data for this investigation. It is divided into nine sections: selection of subjects, treatment of subjects, testing instrument, coder reliability, procedure, method of data collection, scoring of data, treatment of data, and summary.

Selection of Subjects

The population used in this study consisted of two secondary male varsity basketball players who participated during the 1980-81 basketball season in the Central New York area. Selection of the school was based on convenience and the coach's approval. The investigator received each subject's permission to participate in the study through the use of an informed consent form (Appendix A & B). Prior to the first game, the coach identified his athletes as either high-skilled or low-skilled. A player from each group was chosen randomly by selecting names from a cardboard box.

Treatment of Subjects

The two subjects were observed by the investigator for a total of 18 minutes on an alternating interval basis for 20 practice sessions (i.e., Subject 1 was observed for one interval then Subject 2 for an interval, and then back to Subject 1). Each subject was videotaped. The videotapes were coded by the investigator using Academic Learning Time in Physical Education (ALT-PE) (Siedentop, Birdwell, & Metzler, 1979).

Testing Instrument

ALT-PE was the instrument used to measure the amount of learning that

occurred with each of the target players during their practice session. This observational instrument was specifically designed to code behavior of small groups in physical activity settings. The ALT-PE instrument consists of four major category decisions: (a) setting, (b) content, (c) learner moves, and (d) difficulty level. ALT-PE coding involves a 6 second observe/6 second record format for each target subject (i.e., observe one...record one...observe two...record two...observe one, etc.) Siedentop, Birdwell, and Metzler (1979) reported that ALT-PE was a valid instrument.

Coder Reliability

Training for ALT-PE consisted of three phases: an introduction and thorough examination of the ALT-PE coding manual (Metzler, 1980), five practice sessions using videotapes, and one session where an expert observer did a reliability check.

The scored interval agreement method (Hawkins & Dodson, 1975) was used to assess interobserver reliability for this investigation. One randomly selected practice session was coded simultaneously by Dr. Victor H. Mancini, an expert coder in descriptive-analytic studies, and the investigator. Reliability measures were calculated for each of the four levels of the ALT-PE recording system by dividing the number of intervals on which there was agreement by the number of agreements plus disagreements and multiplying the result by 100 (Hersen & Barlow, 1976). The formula is given below:

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

This reliability was carried out on an interval-by-interval basis.

In order to establish coder reliability of the investigator, one

randomly selected practice session was coded at two different settings by the same observer and subjected to the scored interval method.

Procedure

The two subjects were observed by the investigator for a total of 18 minutes on an alternating interval basis for 20 basketball practice sessions (i.e., observe one...record one...observe two...record two...observe one, etc.). During Phase One, each subject, both the high-skilled player and low-skilled player, was videotaped for five practice sessions before the first game of the season. Phase Two and Phase Three involved 10 videotaped practices which were divided equally into five taping sessions after losses and five after wins. Phase Four concluded with five videotaped practices after the last regular season game.

Method of Data Collection

Data for final analysis were collected from all four phases using videotape and coded by the investigator using ALT-PE.

Scoring of Data

Data collected from the coding of ALT-PE were calculated manually. The data were compiled into percentages and ratios for the 27 variables as identified by ALT-PE.

Treatment of Data

Due to the small number of subjects, only descriptive statistics were employed to determine whether differences in student behavior, as identified by ALT-PE, existed between the high-skilled player and the low-skilled player. Manual computation scores of ALT-PE yielded percentages or ratios for the 27 variables. Visual comparisons were made between the high-skilled player and the low-skilled player to determine the relative standings of both athletes on each ALT-PE variable during

Phase One to Phase Four observation periods.

Summary

The subjects for this study were two secondary male varsity basketball players who participated during the 1980-81 basketball season in the Central New York area. They were randomly selected from a high-skilled or low-skilled group, which was determined by the coach prior to the season. Each subject was observed for 18 minutes on an alternating interval basis for 20 basketball practice sessions (i.e., observe one... record one...observe two...record two...observe one, etc.). During Phase One, each subject was videotaped for five practice sessions before the first game of the season. Phase Two and Three involved 10 videotaped practices which divided equally into five taping sessions before the first game of the season. Phase Two and Three involved 10 videotaped practices which divided equally into five taping sessions after losses and five after wins. Phase Four concluded with five videotaped practices after the last regular season game.

Data for analysis were collected from all four phases with videotape and coded by the investigator using ALT-PE. Scores for each of the 27 variables identified by ALT-PE were computed manually.

Descriptive statistics were used to determine whether differences in student behavior, as identified by ALT-PE, existed between a high-skilled player and a low-skilled player. Manual computation scores of ALT-PE yielded percentages or ratios for the 27 variables. Visual comparisons were made between the high-skilled basketball player and the low-skilled basketball player to determine the relative standings of both athletes on each ALT-PE variable during each phase and for all phases combined.

Chapter 4

ANALYSIS OF DATA

This investigation presents the results that were found when comparing the Academic Learning Time-Physical Education (ALT-PE) of a high-skilled basketball player and a low-skilled basketball player in the Central New York area. The Academic Learning Time in Physical Education (ALT-PE) instrument (Siedentop, Birdwell, & Metzler, 1979) was used to measure the behavior of the players. The chapter is divided into seven sections. The first section discusses coder reliability as assessed through the scored interval method. The following four sections present data for each of the four phases. The next section discusses the total accumulation of data from all four phases for both target players. The final section summarizes the analysis of data.

Coder Reliability

The scored interval agreement method as described by Hawkins and Dotson (1975) was used to assess interobserver reliability for this investigation. One randomly selected practice session was coded by the investigator and an expert in descriptive-analytic techniques. Reliability was calculated for each of the four levels of the ALT-PE recording system by dividing the number of intervals on which there was agreement by the number of agreements plus disagreements and multiplying by 100 (Hersen & Barlow, 1976). Interobserver agreement ranged from 83.3 to 100 percent (see Table 1).

In order to establish intraobserver reliability of the investigator, one randomly selected practice session was coded at two different settings

Table 1
Interobserver Reliability

Category	Intervals Recorded		Percent Agreement
	Observer 1	Observer 2	
Setting			
Direct Instruction	134	138	97.1
Group	32	29	90.6
Task	14	15	93.3
Content--General			
Wait	3	3	100.0
Non-academic Instruction	12	11	91.6
Transition	5	6	83.3
Management	6	5	83.3
Break	3	3	100.0
Content--Physical Education			
Skill Practice	27	26	96.3
Scrimmage	21	23	91.3
Game	22	20	90.9
Fitness	15	14	93.3
Knowledge	67	69	97.1

Table 1 (continued)

Category	Intervals Recorded		Percent Agreement
	Observer 1	Observer 2	
Learner Moves			
Engaged Motor	59	58	98.93
Engaged Indirect	14	15	93.3
Engaged Cognitive	44	41	93.2
Not Engaged Waiting	35	38	92.1
Difficulty Level			
Easy	82	76	92.7
Medium	35	38	92.1
Hard	0	0	0.0

by the investigator and subjected to the scored interval method (Hawkins & Dodson, 1975). The results obtained from the comparisons of observations ranged from 83.3 to 100 percent and are illustrated in Table 2. Each of the findings for observer reliability were sufficient to indicate that the coder was reliable.

Phase One: Practice Sessions During Preseason

Table 3 indicated that 20 of the 27 ALT-PE categories were recorded for the high-skilled player and the low-skilled player. Only slight differences existed in three of the ALT-PE levels. However, at the difficulty level distinct differences were revealed between the high-skilled player and the low-skilled player.

It can be seen from Table 3 that only three of the six setting categories were recorded in this phase: direct instruction, group, and task. Of the three categories recorded, direct instruction predominated with 85.3% occurrence in the setting of the high-skilled player and 79.7% for the low-skilled player. Task and group percentages for the high-skilled player were 3.1% and 11.5%, respectively. For the low-skilled player, 4.6% of the time was spent for task and 15.6% of the time was spent working in group situations.

During Phase One 450 intervals were recorded. Of those 450 intervals, 14.4% (65) were recorded as general content for the high-skilled player. For the low-skilled player, 16.8% (76) of the intervals were spent in general content. Table 3 shows that the categories wait, transition, and management were the most predominant for both players. Both players were equally long in transition (4.4%) and almost spent an equal amount of time waiting (6.2% vs. 5.77% for the high-skilled player and the low-skilled player, respectively). The one difference between the two players lies

Table 2
Interobserver Reliability

Category	Intervals Recorded		Percent Agreement
	Observer 1	Observer 2	
Setting			
Direct Instruction	94	89	94.6
Group	30	28	93.3
Task	56	63	88.8
Content--General			
Wait	20	18	90.0
Non-Academic Instruction	11	12	91.7
Transition	50	46	92.0
Management	15	18	83.3
Break	68	70	97.14
Content--Physical Education			
Skill Practice	20	18	90.0
Scrimmage	11	12	91.7
Game	50	46	92.0
Fitness	15	18	83.3
Knowledge	68	70	97.1

Table 2 (continued)

Category	Intervals Recorded		Percent Agreement
	Observer 1	Observer 2	
Learner Moves			
Engaged Motor	61	58	95.1
Engaged Indirect	5	6	83.3
Engaged Cognitive	68	71	95.7
Not Engaged Waiting	31	29	93.5
Difficulty Level			
Easy	78	72	92.3
Medium	101	107	94.4
Hard	1	1	100.0

Table 3

Frequency and Percent Occurrence of ALT-PE Categories for
 a High-Skilled Player and a Low-Skilled Player During
 Phase One: Preseason

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Setting				
Direct Instruction	384	85.33	359	79.77
Task	14	3.12	21	4.62
Group	52	11.55	70	15.61
Total	450	100.00	450	100.00
General Content				
Wait	28	6.20	26	5.77
Transition	20	4.44	20	4.44
Management	12	2.60	26	5.77
Break	--	--	--	--
Non-instruction	5	1.11	4	0.88
Total	65	14.45	76	16.89

*Across category level.

Table 3 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Physical Education Content				
Practice	99	22.00	105	23.33
Scrimmage	20	4.44	20	4.44
Game	35	7.77	15	3.33
Fitness	68	15.11	67	14.80
Knowledge	163	36.22	167	37.11
Social Behavior	--	--	--	--
Other	--	--	--	--
Total	385	85.55	374	83.11
Learner Moves				
Not Engaged				
Interim	2	.50	7	1.80
Waiting	111	28.83	79	21.12
Off-task	1	.02	--	--
Total	114	29.35	86	23.00
Engaged				
Motor	133	34.54	154	41.17
Indirect	7	1.81	1	.26
Cognitive	131	34.02	133	35.56
Total	271	70.37	288	77.00

*Across category level.

Table 3 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Difficulty Level				
Easy	183	67.52	150	52.10
Medium	88	32.47	137	47.56
Hard	--	--	1	.34
Total	271	100.00	288	100.00
ALT-PE	183	40.66	150	33.33
ALT-PE-M	52	11.55	63	14.00

*Across category level.

in the management category. During this phase the low-skilled player spent 5.7% of the time in managerial activities, whereas the high-skilled player only spent 2.6% of the observed time in managerial activities. Of the total content-PE, skill practice and knowledge accounted for 68% of the high-skilled player's time spent in learning activities and 72.7% of the time for the low-skilled player. Very little time was allocated for scrimmaging (4.4% for the low-skilled player and the high-skilled player) and game playing under match conditions (7.7% for the high-skilled player and 3.3% for the low-skilled player). The other major contribution to the content-PE was fitness activity with 15.1% recorded for the high-skilled player and 14.8% recorded for the low-skilled player. No major differences were found in this phase within the content-PE categories when the high-skilled player and the low-skilled player were compared.

The learner moves not engaged categories coded during this phase resulted in the finding of a difference between the two athletes in the time spent waiting during learning activities. During such activities the high-skilled player spent 7.2% more time waiting than the low-skilled player. Off-task behavior during this phase was almost nonexistent, as was the case for the behaviors classified as not engaged interim. Cognitive engagement was practically equal for both players. As far as motor engagement was concerned, during this phase the low-skilled player was motor engaged 6.6% more time than the high-skilled player. Across the whole phase the high-skilled player was engaged 60.2% and not engaged 39.8%, whereas the low-skilled player was engaged 64% and not engaged 36%. A comparison of engaged intervals to the content-PE intervals provides information about the level of on-task behavior during learning activities. The ratio for the high-skilled player and the low-skilled player was .703

to .768. These two ratios indicated the low-skilled player exhibited more on-task behavior than the high-skilled player.

The percent of occurrence for difficulty categories easy, medium, and hard are presented in Table 3. Although the low-skilled player was engaged more often, the high-skilled player, when engaged, worked at the easy level of difficulty 15.4% more of the time than the low-skilled player. The low-skilled athlete spent 15.1% more time than the high-skilled player at the medium level of difficulty. The instances of both the high-skilled player and the low-skilled player functioning at the hard level of difficulty is negligible.

Academic Learning Time-Physical Education (ALT-PE) figures for the high-skilled player and low-skilled player were 40.6% and 33.3%, respectively, but the ALT-PE time that involved motor responses (ALT-PE-M) was 11.6% for the high-skilled player and 14% for the low-skilled player. The results showed a relatively large difference between the ALT-PE and ALT-PE-M of the high-skilled player compared to the low-skilled player.

Phase Two: Practice Sessions Following Wins

A visual comparison of the data in Table 4 was performed to compare the percentage and frequency of occurrence in 23 of the 27 ALT-PE categories for the high-skilled player and the low-skilled player. In this phase, Table 4 showed at the first level setting, only three of the six setting categories were recorded: direct instruction, group, and task. Of the three categories, direct instruction was the dominant mode of instruction with a 79.5% occurrence for the high-skilled player, and 81.5% for the low-skilled player. Group and task occurrence percentages for the high-skilled player were 14.05% and 6.4%, respectively, while the low-skilled player recorded 11.3% for group and 7.3% for task.

Table 4
 Frequency and Percent Occurrence of ALT-PE Categories for
 a High-Skilled Player and a Low-Skilled Player During
 Phase Two: Practices Following Wins

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Setting				
Direct Instruction	358	79.55	366	81.33
Task	29	6.40	33	7.33
Group	63	14.05	51	11.33
Total	450	100.00	450	100.00
General Content				
Wait	5	1.11	9	2.00
Transition	9	2.00	5	1.11
Management	21	4.66	17	3.77
Break	6	1.33	14	3.13
Non-instruction	17	3.77	15	3.33
Total	58	12.89	60	13.34

*Across category level.

Table 4 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Physical Education Content				
Practice	20	4.44	18	4.00
Scrimmage	185	41.11	166	36.88
Game	1	.20	--	--
Fitness	23	5.11	25	5.55
Knowledge	151	33.55	179	39.77
Social Behavior	12	2.66	2	0.44
Other	--	--	--	--
Total	392	87.11	390	80.66
Learner Moves				
Not Engaged				
Interim	11	2.80	7	1.79
Waiting	86	21.95	129	33.07
Off-task	--	--	?	.53
Total	97	24.75	138	35.39
Engaged				
Motor	192	48.99	150	38.46
Indirect	13	3.31	3	.77
Cognitive	90	22.95	99	25.38
Total	295	75.25	252	64.61

*Across category level.

Table 4 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Difficulty Level				
Easy	103	34.91	104	41.26
Medium	191	64.71	148	58.24
Hard	1	.33	--	--
Total	295	100.00	252	100.00
ALT-PE	103	22.88	104	23.11
ALT-PE-M	9	2.00	11	2.44

*Across category level.

A comparison of the results obtained from the content level of the ALT-PE instrument revealed minimal differences in the content general categories between the high-skilled player and the low-skilled player. During this phase both players spent approximately 13% of the time in activities of general content nature. The percent occurrences in general content categories for the high-skilled player were management, 4.6%; transition, 2.0%; wait, 1.1%; break, 1.33%; and non-academic instruction, 3.7%. The low-skilled player's percentages were management, 3.7%; transition, 1.1%; wait, 2%; break, 3.13%; and non-academic instruction, 3.3%.

The time spent in content-PE amounted to 87.1% for the high-skilled player and 86.6% for the low-skilled player. For both players, scrimmage and knowledge accounted for 74.6% and 76.5% of the total time spent in content-PE categories. Comparatively, the high-skilled player and the low-skilled player had small differences in the category of practice (4.4% vs. 4%). During this phase, with the exception of one interval, no game was coded at the content level.

A comparison of the learner moves level revealed considerable differences in the engaged motor category and the not engaged waiting categories. The high-skilled player spent just over 10% more time in actual motor engagement and 11.1% less time waiting (not engaged) during learning activities than the low-skilled player. Percentage of occurrence figures for the other not engaged categories were 1.6% for interim activities and .5% for off task for the low-skilled player and 2.8% for interim activities and 0.00% off task for the high-skilled player. The results of engaged categories for the high-skilled player were motor, 48.9%; indirect, 3.3%; and cognitive, 22.95%. Percentages for the low-

skilled player were motor, 38.4%; indirect, 0.7%; and cognitive, 25.3%. Overall, the high-skilled player was engaged 65.5% and not engaged 34.5%, whereas the low-skilled player was engaged 56% and not engaged 44%.

A comparison of engaged to the content-PE intervals provided information about on-task behavior in learning activities. The ratio for the high-skilled player and the low-skilled player was .752 to .646, respectively. Contrary to the previous phase, during this phase the high-skilled athlete exhibited more on-task behavior.

The percentages of occurrence for the level of difficulty categories easy, medium, and hard are also presented in Table 4. The results indicated that engaged responses classified as easy were dominant for both athletes in the practice sessions observed. The results also showed that differences existed for the easy and medium categories between the high-skilled and the low-skilled player. A difference of 6.35% was found favoring the low-skilled player for the easy category. A 5.9% difference favoring the high-skilled player was found in the medium category. A visual comparison showed slight differences between the ALT-PE and ALT-PE-M of each player. ALT-PE figures for the high-skilled player and the low-skilled player were 22.8% and 23.1% respectively, but the ALT-PE time that involved motor responding (ALT-PE-M) was 2.0% for the high-skilled player and 2.44% for the low-skilled player.

Phase Three: Practice Sessions Following Losses

Table 5 depicts the percentage and frequency of occurrence in 21 of the 27 ALT-PE categories for the high-skilled player and the low-skilled player. Similar to the previous two phases, in this phase only three of the six setting categories were recorded--direct instruction, group, and task. Direct instruction was the category in which the highest

Table 5
 Frequency and Percent Occurrence of ALT-PE Categories for
 a High-Skilled Player and a Low-Skilled Player During
 Phase Three: Practices Following Losses

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Setting				
Direct Instruction	300	66.66	324	72.00
Task	45	10.00	27	6.00
Group	105	23.34	99	22.00
Total	450	100.00	450	100.00
General Content				
Wait	15	3.33	14	3.11
Transition	10	2.22	13	2.80
Management	22	4.88	22	4.88
Break	14	3.11	15	3.33
Non-instruction	12	2.66	12	2.66
Total	73	16.20	76	16.89

*Across category level.

Table 5 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Physical Education Content				
Practice	33	7.33	28	6.22
Scrimmage	71	15.77	62	13.77
Game	85	18.88	51	11.33
Fitness	60	13.33	65	14.44
Knowledge	128	28.44	168	37.33
Social Behavior	--	--	--	--
Other	--	--	--	--
Total	377	83.80	374	83.11
Learner Moves				
Not Engaged				
Interim	21	5.57	16	4.27
Waiting	107	28.38	32	35.29
Off-task	--	--	--	--
Total	128	33.95	148	39.56
Engaged				
Motor	138	36.60	99	26.47
Indirect	23	6.10	21	5.61
Cognitive	88	23.34	106	28.34
Total	249	66.04	226	60.42

*Across category level.

Table 5 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of	Percent	Number of	Percent
	Intervals*	Occurrence*	Intervals*	Occurrence*
Difficulty Level				
Easy	145	58.23	137	60.61
Medium	90	36.14	78	34.51
Hard	14	5.62	11	4.86
Total	249	99.99	226	99.92
ALT-PE	145	32.22	137	30.44
ALT-PE-M	44	9.77	32	7.11

*Across category level.

percentage of occurrence was recorded for both the high-skilled player (66.6%) and the low-skilled player (72.0%). Percentages for group and task categories for the high-skilled player were 23.3% and 10%, respectively; the low-skilled player recorded 22% for group and 6% for task.

The results obtained from the content general categories of the ALT-PE instrument showed similar percent occurrences for both players. Both players spent approximately 16% of their time in activities of general content in nature. The differences between the two players were minimal across each of the five general content categories (see Table 5).

The time spent in content-PE amounted to 83.8% for the high-skilled player and 83.1% for the low-skilled player. Data from the content-PE categories showed considerable differences in the knowledge and game categories for the high-skilled player and the low-skilled player. The high-skilled player was involved in game-type learning activities 7.5% more of the time than the low-skilled player. The latter, however, spent 8.8% more time than the high-skilled player receiving knowledge.

Slight differences between the high-skilled player and the low-skilled player existed for the categories practice, scrimmage, and fitness. The high-skilled player spent slightly more time in practice (1.1%) and in scrimmage (2%), whereas the low-skilled player spent a little more time in fitness (1.1%). At the learner moves level relatively large differences were observed in the engaged motor and not engaged waiting categories between both players. When compared to the low-skilled player, the high-skilled player was actually engaged in 10.2% more motor activity and spent 6.9% less time waiting. On the other hand, the low-skilled player spent 5% more time engaged in cognitive activity. The differences in the

remaining categories were negligible, and off-task behavior was non-existent.

The engaged/content-PE ratio provides information concerning the on-task behavior of the athletes. In this phase the ratios were .660 and .604 for the high-skilled player and the low-skilled player, respectively. Across the whole phase the high-skilled player was engaged 55.3% and not engaged 44.7%, whereas the low-skilled player was engaged 50.2% and not engaged 49.8%.

The percentage of occurrence for the level of difficulty categories easy, medium, and hard are also presented in Table 5. The data showed that engaged responses classified as easy dominated the difficulty level category for both players. The results showed small differences, favoring the high-skilled player in two of the three categories. They were 1.6% and 0.76% in the medium and hard categories. The low-skilled player responded at an easy level of difficulty 2.3% more than the high-skilled player.

The results showed noticeable differences for each player between ALT-PE and ALT-PE-M. ALT-PE figures for the high-skilled player and the low-skilled player were 32.2% and 30.4%, respectively. The ALT-PE time that involved motor responding (ALT-PE-M) was considerably less with 9.87% recorded for the high-skilled player and 7.1% for the low-skilled player.

Phase Four: Practice Sessions During Postseason

Table 6 displays the percentage and frequency of occurrence in 21 of the 27 ALT-PE categories for the high-skilled player and the low-skilled player. The results indicated that distinct differences were evident within the knowledge and game categories of the content-PE level; not

Table 6
 Frequency and Percent Occurrence of ALT-PE Categories for
 a High-Skilled Player and a Low-Skilled Player During
 Phase Four: Postseason Practices

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Setting				
Direct Instruction	315	70.00	320	71.11
Task	53	11.77	52	11.55
Group	82	18.23	78	17.33
Total	450	100.00	450	100.00
General Content				
Wait	15	3.33	16	3.55
Transition	7	1.55	7	1.55
Management	15	3.33	16	3.55
Break	13	2.88	15	3.33
Non-instruction	11	2.44	13	2.88
Total	61	13.56	67	14.89

*Across category level.

Table 6 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of	Percent	Number of	Percent
	Intervals*	Occurrence*	Intervals*	Occurrence*
Physical Education Content				
Practice	53	11.77	51	11.33
Scrimmage	81	18.00	60	13.33
Game	89	19.77	69	15.33
Fitness	35	7.77	42	9.33
Knowledge	125	27.77	151	33.55
Social Behavior	6	1.33	10	2.22
Other	--	--	--	--
Total	389	86.44	383	85.11
Learner Moves				
Not Engaged				
Interim	6	1.54	7	1.82
Waiting	102	26.24	129	33.68
Off-task	--	--	--	--
Total	108	27.78	136	35.50
Engaged				
Motor	139	35.73	133	34.72
Indirect	11	2.82	8	2.08
Cognitive	131	33.67	106	27.67
Total	281	72.22	247	64.47

*Across category level.

Table 6 (continued)

Difficulty Category Level Category	High-Skilled		Low-Skilled	
	Number of	Percent	Number of	Percent
	Intervals*	Occurrence*	Intervals*	Occurrence*
Difficulty Level				
Easy	171	60.81	165	66.80
Medium	110	39.19	82	33.20
Hard	--	--	--	--
Total	281	100.00	247	100.00
ALT-PE	171	38.00	165	36.66
ALT-PE-M	65	14.44	64	14.22

*Across category level.

engaged, waiting, and engaged cognitive categories of the learner moves level; and the easy and medium categories of the difficulty level. Only three of the six setting categories were recorded: direct instruction, group, and task. Direct instruction occurred the greatest percentage of time for both the high-skilled player and the low-skilled player, 70% and 71.1% of the time, respectively. The high-skilled player participated in group activities 18.2% of the time and in task activities 11.7% of the time. Similar percentages for group and task activities were recorded for the low-skilled player, 17.3% for group and 11.5% for the task activities.

Results obtained from the content general level of the high-skilled player and the low-skilled player revealed a slight difference of 1.3%, indicating that the low-skilled player spent only slightly more time in activities that were general content in nature. The differences between the two players within each general content category were negligible during this phase.

The time spent in content-PE amounted to 86.4% for the high-skilled player and 85.1% for the low-skilled player. Differences were found between the high-skilled player and the low-skilled player in the time spent in scrimmage, game, and knowledge activities. The high-skilled player spent 4.7% more time in scrimmage and 4.4% more time in game play while the low-skilled player spent 5.5% more time in the knowledge category. The differences between the two players in the remaining categories were minimal.

In the learner moves level, the data indicated a distinct difference in the engaged cognitive category between the two players. The high-skilled player was cognitively engaged 6% more than the low-skilled player.

Minimal differences existed for the remainder of the engaged categories. Within the not engaged categories, the high-skilled player and the low-skilled player differed only in the percentage of time they spent waiting; the low-skilled player spent 7.4% more time waiting. During this phase the engaged/content-PE ratios, which provides information about the players' on-task behavior, were .704 and .644 for the high-skilled player and the low-skilled player, respectively. Across the whole phase the high-skilled player was engaged in activity 62.4% of the time and not engaged 37.6% of the time. The low-skilled player was engaged in activity 54.8% of the time and not engaged 45.2% of the time.

A visual inspection of the difficulty level showed considerable differences in the easy and medium categories between the high-skilled player and the low-skilled player. When engaged, the low-skilled player was engaged at the easy level of difficulty 6% more often than the high-skilled player. However, a similar difference favored the high-skilled player in the medium difficulty category.

ALT-PE percentages for the high-skilled player and the low-skilled player were 38% and 36% respectively, but the ALT-PE-M time was considerably less at 14.4% for the high-skilled player and 14.2% for the low-skilled player.

Practice Sessions Combined: Phase One Through Phase Four

Table 7 displays the frequency and percent occurrence in 21 of the 27 ALT-PE categories for the high-skilled player and the low-skilled player. The data indicated that marked differences between the high-skilled player and the low-skilled player were evident in the content-PE categories of game and knowledge and in not engaged waiting, engaged motor, and engaged cognitive categories of the learner moves level.

Table 7
 Frequency and Percent Occurrence of ALT-PE Categories for
 a High-Skilled Player and a Low-Skilled Player During
 Phase One Through Four Combined

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Setting				
Direct Instruction	1357	75.38	1369	76.07
Task	141	7.83	133	7.38
Group	302	16.79	298	16.55
Total	1800	100.00	1800	100.00
General Content				
Wait	63	3.50	65	3.61
Transition	46	2.55	45	2.50
Management	70	3.88	81	4.50
Break	33	1.83	44	2.44
Non-instruction	45	2.50	44	2.44
Total	257	14.26	279	15.49

*Across category level.

Table 7 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of	Percent	Number of	Percent
	Intervals*	Occurrence*	Intervals*	Occurrence*
Physical Education Content				
Practice	205	11.38	202	11.22
Scrimmage	357	19.83	308	17.11
Game	210	11.66	135	7.50
Fitness	186	10.33	199	11.05
Knowledge	567	31.50	665	36.94
Social Behavior	18	1.00	12	.66
Other	--	--	--	--
Total	1543	85.74	1521	84.51
Learner Moves				
Not Engaged				
Interim	40	2.59	159	10.45
Waiting	406	26.31	347	22.81
Off-task	1	.06	2	.13
Total	447	28.96	508	33.39
Engaged				
Motor	602	39.01	536	35.23
Indirect	54	3.49	33	2.16
Cognitive	440	28.51	444	29.19
Total	1096	71.01	1013	66.58

*Across category level.

Table 7 (continued)

Category Level Category	High-Skilled		Low-Skilled	
	Number of Intervals*	Percent Occurrence*	Number of Intervals*	Percent Occurrence*
Difficulty Level				
Easy	602	54.92	556	54.88
Medium	479	43.70	446	44.02
Hard	15	1.36	12	1.18
Total	1096	99.98	1014	99.98
ALT-PE	602	33.44	556	30.88
ALT-PE-M	170	9.40	170	9.40

*Across category level.

Table 7 shows that only three of the six setting categories were used for all four phases: direct instruction, group and task. Direct instruction was the predominant category for both the high-skilled player and the low-skilled player and occurred 75.3% and 76% of the time, respectively. Group and task occurrences were 16.7% and 7.8% for the high-skilled player while the low-skilled player recorded 16.5% and 7.3% for these categories.

Results obtained from the content-general categories of the ALT-PE instrument showed no major differences. The low-skilled player spent slightly more time (1.2%) in general content activities than the high-skilled player.

There was a slight difference (1.2%) between the two players when the time in content-PE was compared. The high-skilled player was involved in content-related activities 85.7% of the time compared to the low-skilled player who was involved 84.5%. As stated earlier, within the content-PE categories noticeable differences in the percentages for the knowledge and game categories were found between the two players. The low-skilled player spent 5.4% more time in knowledge activities than the high-skilled player, whereas the high-skilled player spent 4.1% more time in game play. Only slightly more time was spent by the high-skilled player in skill practice (.1%) and scrimmage (2.7%). The low-skilled player spent slightly more time involved in fitness activities (.7%).

In the learner moves level, data indicated a slight difference of 1.3% in the engaged indirect category when comparing the high-skilled player and the low-skilled player. A difference of 3.8% favoring the high-skilled player can be seen in the engaged motor category, whereas a very slight difference of .6% in the cognitively engaged category favored

the low-skilled player. In the not engaged categories a difference of 3.5% can be seen between the two players. The high-skilled player spent more time waiting during activity time than the low-skilled player. A rather large difference (8%) can also be seen in the interim category, favoring the low-skilled player.

The percentages for the difficulty level showed little difference in three categories between the high-skilled player and the low-skilled player. The differences were easy, .1%; medium, .3%; and hard, .2%.

The engaged/content-PE ratio (indicative of on-task behavior) for the high-skilled player was .710 and was .662 for the low-skilled player. Across all observations the high-skilled player was engaged 60.8% of the total practice time, whereas the low-skilled player was engaged 56.2% of the total practice time.

Across the total observance time the ALT-PE for the high-skilled athlete was 33.4% and 30.8% for the low-skilled athlete. The ALT-PE-M was considerably lower; 9.4% was recorded for both athletes.

Summary

Intraobserver reliability for this study was determined by randomly selecting one videotaped practice session and subjecting it to two independent codings. The investigator also obtained interobserver reliability by randomly selecting a videotaped practice session and coding simultaneously with Dr. Victor H. Mancini, an expert coder in descriptive-analytic techniques. A scored-interval agreement method was used to determine reliability (see Table 1 and Table 2). Coder reliability was .833 or better for both interobserver and intraobserver reliability.

During the five preseason practice sessions (Phase One) distinct differences were found in the easy and medium difficulty level categories.

During engagement the high-skilled player worked at an easy level of difficulty 15.4% more often than the low-skilled player. A similar difference was present in the category medium, favoring the low-skilled player. During the observed preseason practice sessions the high-skilled player accumulated 7.3% more ALT-PE than the low-skilled player. The difference between the two players on the accumulated ALT-PE that only involved motor responses (ALT-PE-M), however, was only 2.5%.

During the practice sessions following wins (Phase Two) the major difference between the two players appeared at the learner moves level, which showed that the total engagement level of the high-skilled player was 65.5%, compared to the 56% of the low-skilled player. Furthermore, when not engaged during activity the low-skilled player spent 11.1% more time waiting when compared to the high-skilled player. Little difference existed between the players on the ALT-PE and ALT-PE-M categories. Both players accumulated approximately 23% ALT-PE over the five observed sessions during this phase. The amount of time that both athletes were actively engaged in a motor activity (ALT-PE-M) was considerably less, with 9% and 11% recorded for the high-skilled player and the low-skilled player, respectively.

During Phase Three (practice sessions following losses) differences were found in the categories game, knowledge, not engaged waiting, engaged motor, and cognitive engagement. During these practice sessions the high-skilled player spent 7.5% more time in true game play, spent 6.7% less time waiting when in activity, and 10.2% more time engaged in motor activity than the low-skilled player. The category knowledge showed a difference of 8.8% between the two players favoring the low-skilled player, who also spent 5% more time on cognitive engagement. Following

losses, the high-skilled player experienced slightly more (1.8%) ALT-PE than the low-skilled player. A slightly bigger difference (2.6%) was recorded in the ALT-PE-M category also favoring the high-skilled player.

During the final phase (practice sessions during postseason competition) differences between the two players were found in the categories of scrimmage, game, knowledge, not engaged waiting, engaged cognitive, easy, and medium. During the postseason practice sessions the high-skilled player spent 4.7% more time in scrimmage, 4.4% more time in true game play, and 6% more time cognitively engaged when compared to the low-skilled athlete. The latter, on the other hand, spent 5.7% more time in knowledge type activity, and during activity he spent 7.4% more time waiting. Similar differences in the difficulty level categories of easy and medium between the two players were found. A 6% difference in the easy category favored the low-skilled player, and a 6.1% difference in the medium category favored the high-skilled player. As was the case in the previous phase, during postseason the high-skilled player accumulated slightly more (1.4%) ALT-PE than the low-skilled athlete. But the difference in ALT-PE-M between both players was negligible (.7%).

When all phases were combined, differences were found in the categories game, knowledge, not engaged interim, not engaged waiting, and engaged motor. The data indicated that during practice sessions the high-skilled player spent more (4%) practice time in true game conditions, but also more (4%) time waiting during activity time. When engaged, the high-skilled player was working on motor responses 4% more time than the low-skilled player. On the other hand, the low-skilled player spent 5% more time in activities classified as knowledge at the content level. Furthermore, the low-skilled player spent almost 8% more time in non-

instructional activity (not engaged interim). The differences between the two athletes of total accumulated ALT-PE were small, only 3.4%, when taken over the whole season. ALT-PE which involved motor responses only (ALT-PE-M) was the same for both athletes.

Chapter 5

DISCUSSION OF RESULTS

In this chapter the results of this study are discussed and compared to findings of other related investigations. This study is the first to use the Academic Learning Time-Physical Education (ALT-PE) instrument (Siedentop, Birdwell, & Metzler, 1979) to compare the academic learning time-physical education (ALT-PE) of a high-skilled basketball player and a low-skilled basketball player during a season. This study is only the second study to use ALT-PE to observe behavior patterns of athletes in an interscholastic athletic setting. Rate (1980) utilized ALT-PE to determine the differences in ALT-PE among various secondary interscholastic teams and between the ALT-PE of physical education and athletic environments. Shute, Dodds, Placek, Silverman, and Rife (1982) used ALT-PE and conducted a descriptive-analytic study in physical education to compare the ALT-PE of high-, medium-, and low-skilled students.

Analysis of the data for the high-skilled player and the low-skilled player showed minimal differences in 15 of the 23 ALT-PE variables recorded in Phase One (practices during preseason). A distinct difference was found, however, in the amount of time an athlete successfully engaged in motor activity (ALT-PE-M). The frequency and percentage occurrence of ALT-PE-M for the high-skilled player and the low-skilled player indicated that the high-skilled player successfully performed motor activities more often than the low-skilled player.

Visual comparison of the data in Table 4 revealed noticeable differences in six of the 21 ALT-PE variables recorded for the high-skilled

and the low-skilled player. Data collected during Phase Two (practice sessions following wins) showed differences in the categories scrimmage, knowledge, not engaged waiting, engaged motor, easy, and medium. Negligible differences existed in the levels of ALT-PE and ALT-PE-M of the high-skilled player and the low-skilled player. For both players, the findings were similar.

Visual interpretation of the data displayed in Table 5 indicated marked differences existed for six of the 21 ALT-PE categories. The high-skilled player received more engaged game time. The low-skilled player, however, spent a greater percentage of practice time receiving information and directions (knowledge). Also the low-skilled player spent more time not engaged and when engaged, the success rate was slightly (1.8%) lower than the high-skilled player.

Visual inspection of Table 6 showed noticeable differences in six of the 21 ALT-PE categories recorded. The results in Phase Four indicated that the high-skilled player was engaged in motor activities at a higher success rate when compared to the low-skilled player. The low-skilled player received more information (5.8%) and directions (knowledge) and also was not engaged for a longer amount of practice time.

Visual comparison of the preseason and postseason phases for the high-skilled player and the low-skilled player revealed noticeable differences in each level of the ALT-PE instrument. The findings for the high-skilled player and the low-skilled player in the setting level showed substantial differences in the direct, task, and group instruction categories. Data from the preseason phase of the high-skilled player and the low-skilled player showed that practices were predominantly controlled and paced by the coach. As the practices progressed into the postseason

phase, more time was allotted to the players for task and group activities, although this shift was more profound for the high-skilled players.

During postseason both players spent slightly less time in activities of general nature, and subsequently slightly more time in activities such as scrimmage, and true game situations. For both players a similar trend appears when one looks at shift in emphasis between skill practice, scrimmage, and game. During preseason the focus was on skill practice, whereas during postseason practice sessions more time was spent on scrimmage and game situations. The time spent on skill practice decreased approximately 11% for both players. Time spent on scrimmage increased by 14% for the high-skilled player and by 11% for the low-skilled player. The time spent on full game conditions increased 12% for both players when preseason and postseason data are compared. Furthermore, less time was spent on fitness activities during postseason as compared to preseason (decreases of 7% and 5.5% for the high-skilled player and the low-skilled player, respectively). Activities such as providing background information, talking about certain strategies, etc. (coded as knowledge) were also less prevalent during postseason, although the decrease was less for the low-skilled player.

Data from the learner moves level indicated the changes in the behavior of the high-skilled player were less profound than those of the low-skilled player. During postseason the high-skilled player was engaged slightly more (1.9%) time than during preseason, whereas the level of engagement of the low-skilled player dropped with 12.6% from preseason to postseason. This drop in engagement during learning activities for the low-skilled player was largely due to the increase (12.5%) in the time spent waiting.

The changes in on-task behavior of the two athletes were also consistent with the above changes. The engaged/content-PE ratio, which is an indicator of on-task behavior, remained relatively stable for the high-skilled player (.703 during preseason, and .704 during postseason), whereas the degree of on-task behavior for the low-skilled player dropped from .786 to .644.

The difficulty level data indicated that the high-skilled player was engaged at the easy level of difficulty less often during postseason than during preseason; the opposite was found for the low-skilled player. The low-skilled player's time spent on easy level engagement increased 14.7%.

The data on ALT-PE and ALT-PE-M accumulated from preseason to postseason (all four phases) showed that the high-skilled player dropped in his overall ALT-PE, but increased the amount of time he spent on motor responses at the easy level of difficulty (ALT-PE-M) by almost 3%. The low-skilled player established slight increases in both cases.

When comparing the data of the practice sessions held following wins with those following losses, the following changes were detected. Practice sessions held following losses were characterized by slightly more (3.4%) time spent on activities of general content nature. As far as content-PE activities were concerned, the most profound change lies in the time spent on practice under full game conditions. The practice sessions following wins were characterized by a complete absence of practicing full game conditions, and when players were actually engaged, the emphasis was put on scrimmaging and discussing various strategies and techniques. However, practice sessions following losses showed heavy emphasis on full game play, following skill practice. Time spent on conditioning exercises following losses was also considerably higher. The above changes were

relatively consistent across skill level.

As indicated in the above paragraph, during the practice sessions following losses slightly less time was available for actual practice (content-PE). Furthermore, the on-task behavior of both players was lower during practice sessions following losses. The engaged/content-PE ratio decreased from .752 (wins) to .660 (losses) for the high-skilled player, while the decrease for the low-skilled player was from .646 (wins) to .604 (losses). The biggest factor contributing to the drop in engagement for the high-skilled player following losses was the increase (6.4%) in time spent waiting and the decrease (12.3%) in motor engagement. The low-skilled player's lack of engagement following losses seems largely due to the 12% drop in actual motor engagement during content-PE activity.

The difficulty level data showed that the high-skilled player accumulated more (23.3%) engagement time at the easy level following losses than following wins, as was the case with the low-skilled player (19.3%). This resulted in both players recording a higher percentage of ALT-PE during practice session following losses. ALT-PE following wins was 22.1% and 23.1% for the high-skilled player and the low-skilled player, respectively. Following losses ALT-PE increased to 32.2% and 30.4% for the high-skilled player and the low-skilled player, respectively. ALT-PE that involved motor responses only (ALT-PE-M) was considerably lower during practice sessions following wins for both players when compared to the overall ALT-PE (20% for the high-skilled player and 2.4% for the low-skilled player). Increases of 7.7% and 4.6% in ALT-PE-M for the high-skilled player and the low-skilled player occurred during practice sessions following losses.

At the content-PE level an interesting picture emerges when looking

at the category knowledge. Consistently across skill level and time of season, instruction about the various aspects of the game was the predominant activity. The high-skilled player spent slightly over a third (36.7%) of the available learning activity time (i.e., content-PE only) listening and/or discussing the game of basketball. The low-skilled player's participation in such activity was even higher (43.7%). Over the complete season, the data indicate a decrease of approximately 10% for the high-skilled player and 5% for the low-skilled player in time spent on instruction about basketball. These findings are congruent with the results from the studies of Reisenweaver (1980) and Streeter (1980). It appeared that the passing of information was an important behavior in the coaching setting. Similarly, Tharp and Gallimore (1976) found that John Wooden spent over 50% of his time on some type of instruction.

When all the data of both players are compared, differences on five of the 26 categories were noted. The high-skilled player spent more (4.1%) time in activities resembling true game conditions and spent more (3.5%) time waiting during activity time. When engaged, a higher (3.8%) level of motor engagement was exhibited. On the other hand, the low-skilled player spent more (5.4%) time in activities classified as knowledge and was coded as not engaged interim 7.9% more often than the high-skilled player.

The accumulation of ALT-PE over the 20 observations resulted in only a 2.5% difference favoring the high-skilled player. The high-skilled player was engaged at the easy level of difficulty 33.4% of the total practice time observed, while the low-skilled player was engaged at the same level of difficulty 30.8% of the total observation time. Data from

the 20 observed practice sessions indicated there were no differences found in the amount of engagement in motor responses at the easy level of difficulty (ALT-PE-M). Both students were coded as such in 170 intervals out of the total 1800, which amounted to 9.4% of the total time during 20 practice sessions.

Although the current investigation is different in its conceptualization, some comparisons could be made with the results of studies done by Metzler (1979), Rate (1980), and Shute, Dodds, Placek, Rife, and Silverman (1982). In his 1980 study of boys interscholastic basketball practice sessions, Rate found that 86% of all coaching was direct instruction while Shute et al. (1982) recorded 57% direct instruction in physical education classes. A large difference existed between the percentage of task activities in this investigation and the percentages found by Metzler (1979). Metzler (1979) recorded 28.9% for task activities compared to only 7.8% and 7.3% for the high-skilled player and the low-skilled player in this study. The 75.3% and 76% recorded for direct instruction in the athletic practice sessions of the high-skilled player and the low-skilled player were relatively similar to the 70.7% average found in elementary and secondary physical education classes observed by Metzler (1979). This study was the only study that recorded group instruction with 16.7% occurrence for the high-skilled player and 16.5% for the low-skilled player. Although some variation in teaching style existed among basketball coaches and physical educators, each appeared to conduct their practices and classes in a strict and business-like manner.

The content-general figures of 14.2% and 15.4% in this study were less than the 26% reported by Metzler (1979) and less than the 21%

observed by Shute et al. (1982) in physical education classes. Smaller differences existed in the content-general of practice sessions for this study and Rate's (1980) study. Rate (1980) found an average of 8.8% of practice time spent in content-general-type activities. Possible factors contributing to this result were that athletic squads were smaller on the average than formal physical education classes and thus managerial and control problems were reduced; transition periods were also shorter. This may have been enhanced by the good use of team managers during the practice sessions.

The content-PE percentages for the high-skilled player and the low-skilled player (85% vs. 84%) recorded in practice sessions were slightly more than the 78% recorded for the high-skilled student and the 80% recorded for the low-skilled student observed by Shute et al. (1982) in physical education classes.

As indicated earlier, one of the chief strategies employed in this study was knowledge. Approximately a third of all content specific activity (i.e., content-PE) for the high-skilled player and the low-skilled player was cognitive in nature (knowledge). The high-skilled player and the low-skilled player were put into situations which focused on the coach providing information. Rate (1980) reported knowledge less activities occurred less than 10% in interscholastic basketball settings while Metzler (1979) observed that an average of 15% of the total class time had knowledge focus in physical education classes. Shute et al. (1982) reported the knowledge focus to be present 23% of the class time. In this investigation theoretical discussion and strategy planning were vital parts of most practice sessions. The practice sessions for Rate (1980) were conducted generally within the realm of scrimmages and skill

practice. Rate's findings showed that skill practice and scrimmage were the focus of the basketball practice sessions for 38% of the total time. These figures were considerably larger than the percentages recorded in this study. In comparison with the physical education setting, Metzler (1979) reported that scrimmage was practically absent while skill practice and game conditions comprised 56% of the total content-PE recorded. In the physical education setting Shute et al. (1982) recorded similar data with 45% of the class time spent on practice and scrimmage combined. It appears that the major difference between the current investigation and those conducted by Metzler (1979), Rate (1980), and Shute et al. (1982) lies in the decreased focus on skill practice and game play and increased emphases on scrimmage.

The results obtained from the learner moves level in this study are in direct contrast to those obtained in Metzler's (1979) and Shute et al.'s (1982) study of physical education classes. These studies found that physical education classes had a relatively equal amount of engaged and unengaged time. In contrast, the athletic practice sessions of this study and Rate's (1980) study had more engaged intervals. Metzler (1979) and Shute et al. (1982) also found an equal distribution of motor engaged and cognitive engaged periods. In this investigation, a slight difference existed favoring motor engagement, while in Rate's (1980) study the ratio of motor engaged to cognitive engaged was almost 3:1. The results pertaining to the time spent waiting during activity of this study are congruent with previous findings. In this investigation, not engaged waiting accounted for 26.3% of the time for the high-skilled player and 22.8% of the time for the low-skilled player. For comparative purposes, the average practice time spent waiting for this study's

subjects was 24.5%. That percentage is similar to the not engaged waiting percentages found in Metzler's (1979) study (27.5%), Rate's (1980) study (23.1%), and the Shute et al.'s (1982) investigation (24%). Finally, off-task behavior was seldom recorded in the competitive setting of this investigation and in Rate's (1980) study. However, Metzler (1979) and Shute et al. (1982) observed a larger occurrence of off-task behavior in physical education classes. Causes for these differences in off-task behavior in the athletic settings compared to the physical education environment can only be speculated.

The number of intervals coded easy in this study were as much as 42% less than findings in previous studies (Metzler, 1979; Rate, 1980; Shute et al., 1982). It was not rare to observe the high-skilled player and the low-skilled player in the practice sessions being asked to perform new skills or to incorporate new offenses and defenses. However, most of the practices also involved repetitions of previously learned skills and plays. The relatively high level of medium difficulty intervals observed in this study can be attributed to particular practices which were designed to narrow the range of error on specific basketball skills and produce some difficulty for the high-skilled player and the low-skilled player.

ALT-PE data of this study appear to be at some variance with those of previous studies. A large discrepancy existed in the ALT-PE recorded in this study and Rate's (1980) study. The figure obtained by Rate (1980) was considerably larger than the 33.4% and 30.8% ALT-PE obtained for the high-skilled player and the low-skilled player in this study. Rate (1980) reported an ALT-PE figure of 51.4% in basketball settings. Additional ALT-PE differences were evident when the interscholastic environment was

compared to the physical education setting. Metzler (1979) reported ALT-PE occurred 26.8% in the physical education environment. Some similarity was found between the ALT-PE data of this investigation and the ALT-PE data found by Shute et al. (1982). Shute et al. (1982) reported ALT-PE figures of 38% for the high-skilled students and 35% for the low-skilled students.

When ALT-PE was adjusted to ALT-PE-M, a reduction of 24% for the high-skilled player and 21.4% for the low-skilled player occurred. This was very similar to the results found in the physical education settings in the studies by Shute et al. (1982) and Metzler (1979). In the Shute et al. (1982) investigation both high- and low-skilled students' ALT-PE-M figures were 22% lower than the overall ALT-PE figure. In the study completed by Metzler (1979), the adjustment from ALT-PE to ALT-PE-M resulted in a decrease of 19.3%, from 26.8% ALT-PE to 7.5% ALT-PE-M. In Rate's (1980) study of basketball practice sessions, the same adjustment resulted in a decrease of 17.1%.

Summary

Due to the small number of subjects the results of this investigation were obtained through visual interpretation of the data. Visual interpretation of the data led to the rejection of the null hypothesis that stated there will be no noticeable differences in the Academic Learning Time-Physical Education (ALT-PE) of a high-skilled basketball player and a low-skilled basketball player.

Analysis of each phase revealed differences in the percentage of ALT-PE ranging from .22% (wins) to 1.8% (preseason) between the high-skilled player and the low-skilled player. Results from Phase One indicated that the ALT-PE-M for the high-skilled player was lower than the ALT-PE-M recorded for the low-skilled player. Noticeable differences were found

in Phase Two in the engaged motor and not engaged waiting categories. The waiting percentage was higher for the low-skilled player while the motor involvement percentages favored the high-skilled player. No differences existed between the two players in the ALT-PE and ALT-PE-M variables, which were lowest following wins. Data collected during Phase Three (practice sessions following losses) indicated differences in the categories game, knowledge, not engaged waiting, engaged motor, and engaged cognitive, but the data on ALT-PE and ALT-PE-M were relatively similar. Phase Four results showed that the high-skilled player participated substantially more in game and scrimmage. ALT-PE and ALT-PE-M categories showed no major differences. The low-skilled player spent more time in activities coded as knowledge and not engaged waiting.

Visual comparison of the high-skilled player and the low-skilled player revealed substantial differences between the preseason and post-season observation periods. Both athletes exhibited more peer instruction and feedback in the postseason phase, whereas a generally strict, coach-directed manner was employed during postseason. However, during postseason the high-skilled player showed an increase of time spent in game, scrimmage, and engaged motor. Engagement motor responses only (ALT-PE-M) was also higher during postseason. The low-skilled player spent more time during preseason in the categories practice and knowledge. However, the data for the category not engaged waiting were higher during postseason.

Comparisons of Phase Two (practices following wins) and Three (practices following losses) showed that following losses slightly more time was spent in activities of general nature. Another major difference found was the absence of the practice within a full game context following

wins. On-task behavior was lower for both players following losses as compared to practice sessions following wins. The time spent waiting during activity time was higher for both players following losses.

The findings of this investigation differed to varying degrees from the results of Academic Learning Time-Physical Education studies conducted by Rate (1980) within the interscholastic settings, and by Metzler (1979) and Shute et al. (1982) in physical education settings. The findings of direct instruction as the predominant mode of teaching, the percentage of time spent waiting, and the considerable decrease that occurred when ALT-PE was adjusted to ALT-PE-M were similar to the findings of Rate (1980), and Metzler (1980), and Shute et al. (1982). Results for the learner moves categories, particularly time engaged, were in direct contrast to those obtained by Metzler (1979) and Shute et al. (1982). The finding that the athletes spent a large percentage of their time receiving instruction was in congruence with the findings of Reisenweaver (1980), Streeter (1980), and Tharp and Gallimore (1976). Rate (1980) recorded a larger percentage of time spent in ALT-PE than was found for both players in this investigation. However, the percentages recorded for ALT-PE in this investigation were similar to those found by Shute et al. (1982).

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The purpose of this investigation was to determine if differences existed between the Academic Learning Time-Physical Education (ALT-PE) of a high-skilled male secondary basketball player and a low-skilled male secondary basketball player. One male secondary basketball coach and a high-skilled player and a low-skilled player from the Central New York area served as subjects. Prior to the first game, the coach identified his players as either high-skilled or low-skilled. The top 33% were designated as high-skilled players; the bottom 33% were designated as low-skilled players. A player from each group was chosen to be subjects by randomly selecting names from a cardboard container.

Data for analysis were collected from 20 videotaped practice sessions which were equally divided into four separate phases. During Phase One each player was videotaped for five practice sessions before the first game of the season. Phase Two and Phase Three involved five videotaped practices each, with five practices videotaped following wins and five videotaped following losses. Phase Four consisted of five videotaped practice sessions following the last regular season game while the team was preparing for postseason competition. The videotapes were then coded by the investigator using the ALT-PE instrument (Siedentop, Birdwell, & Metzler, 1979) to assess the high-skilled players' and the low-skilled players' accumulated ALT-PE in each practice session for each phase and for all phases.

Examination of the data resulted in the finding of minor differences in accumulated ALT-PE between the high-skilled player and the low-skilled player. Although no statistical analyses were performed on the data, visual comparison of the data yielded differences which resulted in the rejection of the hypothesis which stated that there would be no differences in the ALT-PE of a high-skilled player and a low-skilled player.

Data from all four phases revealed that game, knowledge, not engaged interim, not engaged waiting, engaged motor, and ALT-PE categories accounted for the differences between players. The high-skilled player had a greater percentage of game, engaged motor, not engaged waiting, and ALT-PE. The low-skilled player spent a greater percentage of time in knowledge and not engaged interim responses.

Conclusions

The results of this study led to the following conclusions regarding the accumulated ALT-PE of a high-skilled basketball player and a low-skilled basketball player.

1. The total accumulation of the four phases revealed there were no setting or content-general differences between the high-skilled player and the low-skilled player.
2. The high-skilled player and the low-skilled player spent approximately 85% of all practice time in content-PE.
3. The high-skilled player spent more time in active engagement during practice.
4. The high-skilled player was more actively involved in motor responses.
5. The high-skilled player was found to have spent a greater amount of time in game situations.

6. The high-skilled player spent a greater time inactively waiting to participate during activity time when compared to the low-skilled athlete.

7. The low-skilled player spent a greater amount of time in activities classified as knowledge as compared to the high-skilled player.

8. There was no difference between the two players in the amount of time spent engaged at an easy level of difficulty which involved motor responses only (ALT-PE-M).

Recommendations for Further Study

The following recommendations are suggested for further study:

1. A replication of this study could be undertaken at the secondary level.

2. A study which would investigate the factors that contributed to differences between the high-skilled player and the low-skilled player.

3. A similar investigation of the differences in ALT-PE of a high-skilled male secondary athlete and a low-skilled male secondary athlete in another athletic setting.

4. A similar investigation using a high-skilled female secondary athlete and a low-skilled female secondary athlete who are coached by a female coach.

Appendix A
INFORMED CONSENT FORM
COACH COPY

The study in which you are asked to participate is looking at the Academic Learning Time-Physical Education of a high-skilled basketball player and a low-skilled basketball player. Academic Learning Time-Physical Education is that portion of practice that these athletes spend engaged in basketball activity at an easy level of success.

The following procedures will be used: you will be videotaped throughout the entire basketball season. The period that you will be videotaped will be for 20 entire practice sessions. During those periods you will be wearing a microphone which should not interfere with your coaching activities. Prior to the taping of the first practice session, you will be asked to group your players as either high- or low-skilled athletes. The top 33% will be designated as the high-skilled; the bottom 33% designated as the low-skilled. The time needed to accomplish this task will be approximately ten minutes. A player from each group will be randomly selected from a cardboard container.

It is assured that all information about you will be kept strictly confidential. If you do not have any questions, and if you are willing to participate in the study, please sign your name on the line below.

Name: _____

Date: _____

Appendix B
INFORMED CONSENT FORM
ATHLETE COPY

The study in which you are asked to participate is looking at the Academic Learning Time-Physical Education of a high-skilled basketball player and a low-skilled basketball player. Academic Learning Time-Physical Education is that portion of practice that these athletes spend engaged in basketball activity at an easy level of difficulty.

The following procedure will be used: you will be videotaped throughout the entire basketball season. The period that you are videotaped will be for 20 entire practice sessions.

It is assured that all the information about you will be kept strictly confidential. If you do not have any questions, sign your name on the line below.

Name: _____

Date: _____

Appendix C

THE ALT-PE CATEGORIES

Setting Level

Direct Instruction (D). Coach controls focus and pacing of the instruction.

Task Instruction (T). Instruction defined by task--multiple station and/or multiple task.

Reciprocal (R). Athletes in identifiable pairs for instruction and feedback.

Group (G). Same function as reciprocal with large group.

Guided Discovery (GD). Coach leads athletes toward predetermined goal through series of sequenced prompts.

Problem Solving (P). Coach controls instruction through sequenced problems in which alternative solutions are possible.

Content-General

Wait (W). Periods of no activity and no movement prior to and between activities.

Transition (T). Periods of change from one activity to another, including lining up or quieting down for the next activity.

Management (M). Time devoted to practice business which is unrelated to the instructional activities of the day.

Break (B). Intentional periods of no activity to rest athletes, drink water, etc. Breaks must be initiated by the coach.

Non-Academic Instruction (N). Activities which fall outside the domain of focused instruction such as rapport building activities.

Appendix C (continued)

Content-Physical Education

Skill Practice (P). Participation in drills and other instructional activities in which the primary goal is individual skill development.

Scrimmage (S). Controlled group practice in which instruction and feedback are frequent. It includes the simulation and/or modification of game playing to focus upon a specific instructional point.

Game (G). Practice under game conditions.

Fitness (F). Repetitive activities for fitness development.

Includes warm-up and cool-down activities, such as stretching.

Other Motor Activity (O). Motor activity unrelated to specific goals of the day's instruction is other motor activity.

Knowledge Focus (K). Activities which have knowledge about skill, background information, etc., as the focus.

Social Behavior (B). Activities in which social behavior, attitudes, etc., are the focus.

Learner Moves Level

Engaged Motor Responding (M). Athlete is performing a skill.

Engaged, Indirect Participation (I). Athlete is in an activity but not directly involved with the immediate action (includes assisting others in skill practice, such as spotting, setting up targets, retrieving balls, etc.).

Engaged Cognitive (C). Cognitive involvement related to instruction, such as listening, questioning, verbal responding or thinking about the activity.

Appendix C (continued)

Learner Moves Level (continued)

Not Engaged, Interim (NI). Any non-instructional activity that is part of the P.E. activity. Changing sides of the net and times out between points is not engaged, interim.

Not Engaged, Waiting (NW). Time during activity when athlete is waiting for help or waiting to participate again. Being a substitute in a game is not engaged, waiting.

Not Engaged, Off-Task (NO). Athlete is inappropriately disengaged from the lesson.

Difficulty Level

Easy (E). Few errors are made and athlete performs appropriately with little effort, experiencing success frequently.

Medium (M). Any performance that is other than easy or hard.

Hard (H). Many errors are made, and athlete appears to be unable to perform appropriately, experiencing success infrequently.

Cited from Siedentop, Birdwell, & Metzler (1979).

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