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The effects of periodic prompting on preservice physical education teachers' teaching behaviors

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**THE EFFECTS OF PERIODIC PROMPTING ON PRESERVICE PHYSICAL
EDUCATION TEACHERS' TEACHING BEHAVIORS**

**A Thesis Presented to the Faculty of
the School of
Health Sciences and Human Performance at
Ithaca College**

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

**By
Erika Backus
September 2002**

Ithaca College
School of Health Sciences and Human Performance
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF EXERCISE AND SPORT SCIENCES THESIS

This is to certify that the Master of Exercise and Sport Sciences Thesis of

Erika Backus

submitted in partial fulfillment of the requirements for the degree
of Master of Exercise and Sport Sciences in the School of Health
Sciences and Human Performance at Ithaca College has been
approved.

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ABSTRACT

The objective of this study was to determine the effects of periodic prompting on the teaching behaviors of preservice physical education teachers during micropeer teaching sessions. Fifty-four preservice physical education teachers enrolled in the Curriculum and Methods classes at a professional preparation college located in Central New York served as subjects and were randomly divided into two groups: a control group and a treatment group. Each subject taught three 10-minute micropeer lessons which were videotaped. Subjects received periodic prompting from the investigator during the lesson via the use of a two-way wireless communication system. The control group received general prompting concerning teacher movement, classroom management, class structure, and class control. The treatment group received general periodic prompting, plus specific prompting regarding the type and frequency of feedback and the use of and frequency of students' names. At the conclusion of each micropeer teaching session, each preservice teacher had an individual feedback session with the investigator regarding his or her teaching performance. Each student videotape was coded by Dr. Victor H. Mancini, an expert in descriptive analytic coding. The videotapes were coded using the Academic Learning Time in Physical Education (ALT-PE) coding instrument. The ALT-PE data obtained from the first micropeer teaching session served as the pretest data (Phase I). The second and third sessions served as treatment phases, with the third serving as the posttest data (Phase III). Descriptive statistics were used to compare the preservice teachers' observed and perceived behaviors from Phase I to Phase III. In Phase I, there were no significant differences between the control and treatment groups in the teaching behaviors of preservice physical education teachers following periodic prompting. Significant differences were found in Phase III of this investigation. The areas where differences occurred included

general content, transition, skill practice, non-engaged activity, waiting, engaged activity, motor appropriate activity (ALT-PE), and motor inappropriate activity. Compared to the control group, the treatment group accrued less time in the general content area, which included spending less time in transition during class settings. Compared to the control group, students in the treatment group spent less time waiting, more time involved in skill practice activities, and less time involved in game play. Consequently students had more opportunity to improve individual skills. Audio-cueing and specific cues were found to be more effective than general cues for improving preservice teacher performance. The findings of this investigation led to the rejection of the hypothesis that there would be no significant differences in the teaching behavior or ALT-PE of students for preservice physical education teachers following periodic prompting. It was concluded that the use of a communication system during teaching and that specific prompting is more effective than general prompting in the development of preservice teachers' behaviors.

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Chapter 1

INTRODUCTION

The physical education profession has gone through a great deal of change throughout the past 20 years. Educators have undergone a transformation from the concept of teaching the child to be “busy, happy, and good” to promoting active learning and lifelong physical activity. Today’s curricula entail a complex integration of cognitive, affective, and psychomotor experiences that are not only immediately meaningful to the student, but will carry over into the adult roles that the student will eventually assume (Fay, 1996). To develop these new curriculum concepts, educators need to undergo appropriate training which will enable them to teach in any educational situation, while at the same time enhancing the learning capabilities of each child regardless of the teaching environment. The amount of student learning which takes place stems largely from the overall effectiveness of the teacher. Through prompting, cueing, and questioning, teachers can help students recognize similarities among tasks in physical education class, other classes, and, ultimately, in their own lives (McBride, 1997).

Increasing teacher effectiveness and the development of future professionals starts with the pre-professional education which students receive at the college or undergraduate level. Proper teacher education programs help to ensure the overall effectiveness and quality of future teachers. Strong education programs not only develop the student into a teacher, but these programs provide undergraduate students with the knowledge and skills which will enable them to

educate their own students in such a manner that each child can benefit from a high degree of learning. At this level, one situation used by educators is the preservice teaching episodes in which the teacher has the opportunity to increase his or her teaching abilities and skills. Preservice teaching may include student teaching, micropeer teaching, or internships.

Professionalism is developed through experiential learning activities which take students beyond the classroom into real work environments. These preservice situations provide students with the chance to practice the skills needed in their future profession. Students can develop teaching styles, time management strategies, discipline techniques, feedback usage, and classroom management techniques through effective preservice teaching and micropeer teaching. With periodic prompting and feedback, instructors can help preservice teachers learn how to increase and improve their overall teaching performances.

At the undergraduate level, professors, teachers and graduate assistants all play a role in the development of the preservice teacher. They provide feedback to the preservice teachers, which can be used by preservice teachers to improve their effectiveness. Siedentop and Tannerhill (2000) stated that teaching must be viewed as a set of observable process skills to be practiced, evaluated, and reflected upon in ensuring improved future performance. The inclusion of systematic observation and feedback as part of this process can further pedagogical development.

There has been considerable research conducted to examine teacher effectiveness and the education that teachers were given prior to becoming a professional. The primary focus of those studies centered around student learning and instructional behaviors such as feedback, time and classroom management, student engagement, and verbal interaction. These studies and systematic observation instruments that were developed allowed for teacher evaluation and were the responses to the world's outcry for accountability in the classroom (Dodds, 1973).

During the 1970s, one of the first studies to investigate the relationship between time management was the Beginning Teacher Evaluation Study (BTES). BTES examined elementary instruction and teacher effectiveness in both reading and mathematics for grades 2 and 5 (Berliner, 1979). The study's purpose was to identify teaching activities and classroom conditions that foster learning. It was found that student learning was positively associated with the amount of time the teacher allocated to instruction. The study also found that the amount of time students are actually engaged is positively associated with learning. High success is positively associated with student learning. With high success rates, students were more likely to have positive attitudes towards subject areas and school (Berliner, 1979). Engaged time became known as Academic Learning Time (ALT). Although the BTES study was originally established to look at math and reading, the ALT concept can be incorporated into any curriculum. When used during physical education, the concept becomes Academic Learning Time in

Physical Education (ALT-PE).

ALT was initially used as a process-product measure of teaching effectiveness, and defined as the amount of time a student spends in relevant academic tasks which result in a high rate of success. Van der Mars (1979) used the concepts of ALT-PE in his case study which looked at the effects of audio-cueing on teaching behaviors. Throughout the teaching episodes, van der Mars gave the teacher cues via an audio-cueing device. He found that periodic prompting, feedback and cueing increased the preservice teachers' use of names and frequency of feedback. It was also found that use of a communication system during teaching was beneficial in the development of a teacher's awareness and organization during teaching.

In 1988, van der Mars continued his research on the effects of audio-cueing on teaching. In this investigation audio-cueing was used to increase the use of positive verbal behavior feedback and specific positive skill feedback. Audio-cueing was found to produce immediate and substantial changes in teaching behavior.

The van der Mars' studies are two examples of the many studies that have been conducted in regards to improving teacher performance and effectiveness. This study is a follow-up of the van der Mars' (1984) dissertation to determine if prompting would be effective in improving preservice teachers' behaviors in micropeer teaching settings.

Scope of the Problem

The purpose of this study was to determine if periodic prompting of preservice physical education teachers had any affect on observed teacher interaction patterns, behaviors, and ALT-PE of students. Fifty-four preservice physical education teachers enrolled in the Curriculum and Methods classes at a professional preparation college located in central New York served as subjects for this investigation and were randomly divided into two groups: a control group and a treatment group. All subjects were videotaped during each of the three micropeer teaching sessions, as required for the Curriculum and Methods classes. Each teaching lesson was 10 minutes in length. During each lesson, the preservice teacher received periodic prompting from the investigator by means of a two-way wireless communication system. Those students assigned to the control group received periodic prompting relating to teacher movement and classroom management. In addition to the prompting received by the control group, those students in the treatment group received prompting relating to the use of prompts and cues, the frequency of student name use, and the type and frequency of feedback which was used when teaching. The first micropeer teaching (Phase I) session served as the baseline for the investigation, with the second and third teachings serving as the treatment portion for the study. The third micropeer teaching (Phase III) also served as the posttest phase. Following each of the three teaching sessions, students met individually with the investigator for feedback sessions regarding their teaching performances. During the feedback

sessions, the preservice teachers were given feedback based upon their random selection to either the treatment or control group. Students were also given suggestions to further enhance their teaching performances.

All students were videotaped during their micropeer teaching sessions. At the conclusion of the micropeer teaching sessions, all videotapes were coded using the ALT-PE coding system. The ALT-PE instrument was used to determine if a change in teaching behaviors existed from Phase I to Phase III of the investigation, following periodic prompting during teaching lessons and individual feedback sessions. All videotapes were coded by Dr. Victor H. Mancini, an expert in descriptive-analytic coding techniques.

Statement of the Problem

This investigation was conducted to study the effects of periodic prompting on preservice physical education teachers' teaching behaviors and students' ALT-PE. The effect of periodic prompting on preservice physical education teachers and their teaching performance was measured by the Academic Learning Time - Physical Education (ALT-PE) coding instrument.

Hypothesis

There will be no significant difference in the teaching behaviors or ALT-PE of students for preservice physical education teachers who received periodic prompting during teaching sessions and preservice physical education teachers who did not receive prompting during micropeer teaching sessions.

Assumptions of the Study

The following assumptions were made relative to this investigation:

1. The subjects selected were representative of preservice physical education teachers at a professional preparation program in a central New York college.
2. The coding instrument, ALT-PE, and the coding of three micropeer teaching sessions provided adequate data regarding the observed teaching behaviors that occurred during the micropeer teaching sessions.
3. The coder is reliable using the ALT-PE coding instrument.
4. The four randomly selected videotapes represent the entire population of preservice teachers participating in this study for the purposes of coder reliability.
5. Periodic prompting of preservice teachers will not interfere with the preservice teachers' normal teaching actions.

Definition of Terms

The following terms have been operationally defined for the purpose of this study.

1. Academic Learning Time (ALT) is the amount of time a student spends engaged in a task, resulting in learning and a high degree of success (Woolfolk, 1993).
2. Academic Learning Time in Physical Education (ALT-PE) is the amount of time in which a student is engaged in relevant physical education

content in such a way that he or she has an appropriate chance to be successful (Siedentop, 1991).

3. Preservice teacher is a physical education undergraduate student who has yet to participate in the formal student teaching program (van der Mars, 1979).

4. Micropeer teaching is a method of instruction in teacher education which enables preservice teachers to practice teaching skills by teaching their classmates (van der Mars, 1979).

5. Feedback is information generated about a response that is used to modify the next response (Siedentop, 1991).

6. Prompts are stimuli given before or during the performance of a behavior which cue student skill responses (Cooper, Heron, & Heward, 1987).

7. Cues are words or phrases that identify or communicate to a performer the critical features of a movement skill or task (Rink, 1993).

8. Hustles are prompts that focus on energizing the students to respond quickly (Siedentop, 1991).

9. Systematic observation and analysis is a process of collecting objective information on the instructional process and analyzing that information in a meaningful way (Rink, 1993).

10. Allocated time is that time which a teacher plans for students to be engaged in motor activities during a lesson (Metzler, 1979).

11. Engaged time is the time a student is actually physically engaged in the activity (Metzler, 1979).

12. Teacher observation is a form of assessment in physical education which can be used systematically to provide objective data regarding student performance (NASPE, 1995).

13. Significance is defined as a difference of 5% or greater between the data being compared.

Delimitations of Study

The following delimitations were made regarding this investigation:

1. The subjects were preservice physical education teachers enrolled in the Curriculum and Methods classes at a professional preparation institution in central New York.

2. All subjects were observed only three times in micropeer teaching situations.

3. The ALT-PE coding system was the only instrument used for this study.

Limitations of Study

The following are limitations that were made regarding this study:

1. The findings may only apply to preservice physical education teachers enrolled in the Curriculum and Methods classes similar to those at a professional preparation institution in central New York.

2. Findings may only apply to lessons taught in micropeer teaching

situations.

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

Chapter 2

REVIEW OF LITERATURE

The objective of this chapter is to review the available research concerning the variables under investigation for this study. This review focuses on the following areas: (a) systematic observation in physical education, (b) Academic Learning Time - Physical Education, (c) feedback, (d) preservice teaching, and (e) the summary.

Systematic Observation in Physical Education

Systematic observation allows a trained person, following stated guidelines, to observe, record, and analyze interactions with the assurance that others viewing the same sequence of events would agree with the recorded data (Darst, Mancini, & Zakrajsek, 1983). Beginning in the 1960s, systematic observation unfolded as an important means by which to record both teacher and student behaviors in the classroom settings. Systematic observation was the answer to the education world's outcry for accountability. By using this means of observation in the classroom setting, teachers have been able to examine and evaluate existing conditions and make appropriate changes: this enables their programs to be more educationally accountable. Locke (1982) stated that systematic observation has indeed played a major role in generating at least some answers regarding good teaching and has contributed to the development of the language of teaching.

In 1971, Rosenshine published a report in which eight teacher behavior variables were found to consistently correlate with student achievement. The eight variables were teacher clarity, variability, enthusiasm, task-orientated or businesslike behavior, teacher indirectness, student opportunity to learn criterion materials, use of structuring comments, and criticism. Although teacher behaviors remain an important focus of research endeavors, some researchers have chosen to look at student behaviors. Today, direct observations in the classroom setting focus on both teachers and students' behaviors. Through research on student behaviors, the time-on-task, student engagement, and academic learning time (ALT) concepts were developed.

Beginning in the 1970s, the Ohio State University became one of the leading institutions for the development of systematic observation systems. Daryl Siedentop's leadership led to the development of many observation systems which can be used to study and modify teaching behavior.

The initial systematic observation system was developed in the early 1970s by Hughley (1973). The OSU Teacher Behavior Rating Scale used event recording with 5-minute intervals to gather descriptive data on teaching behaviors. This system used eight categories to evaluate teacher behaviors. The eight categories were input teaching acts, managerial activities, monitoring, no activity, skill attempt-positive information feedback, skill attempt-negative information feedback, positive reaction to on-task behavior, and negative reaction to off-task behavior. This system can be useful when student teachers are

observed (Hughley, 1973).

In 1973, another observation was developed by Siedentop and Rife to code the managerial efficiency of physical education classes. The Data Collection for Managerial Efficiency in Physical Education (DACOME-PE) uses both event recording and duration recording to look at teacher managerial behaviors, positive and negative teacher reactions to student management, and the percentage of class time spent in management; these behaviors comprise a managerial episode which occurs at different times during a class. DACOME-PE indicates the amounts of behavior the teacher devotes to managing the class and how much time the students spend in management-related activity (Rife, 1973).

Patt Dodds (1973) combined the work of Rife (1973), Hughley (1973), Darst (1974), and others to develop the Student Teachers Observing Peer (STOP) observation instrument. This instrument was designed for use by student teachers as a means of peer observation and feedback. Four categories were used to observe teacher behaviors using event recording, duration recording, and placheck. Those included management, instructional input, skill feedback, and social behavior feedback. This system was designed to help educate student teachers about their teaching behaviors.

Darst (1974), Dodds (1973), Hughley (1973), and Rife (1973) all developed systematic observational instruments under the direction of Daryl Siedentop and the Ohio State University. These innovative instruments served as a means of evaluation of teachers and classroom environments. The Ohio State

University was not the only university which was developing systematic observation tools for the educational setting. In 1975, Anderson initiated the Videotape Data Bank Project at Columbia University. This project was designed to develop observation systems for physical education teachers during normal class settings. This project used time recording and duration was calculated for each of the six categories, along with descriptive analysis which provided information about how time was spent across several teacher roles.

Other systematic observation systems that were developed included Cheffers' Adaptation of the Flanders' Interaction Analysis System (CAFIAS), the Dyadic Adaptation of the Cheffers' Adaptation of the Flanders' Interaction Analysis System (DAC), and the Self-Assessment Feedback Instrument (SAFI). In 1972, Cheffers developed a systematic observation system which was used to objectively code verbal and non-verbal behaviors between teachers and students in a sequential matter. Martinek and Mancini (1979) developed DAC which provides teachers with descriptive information about their interactions with a specific student or small group of students. Mancini and Wuest (1987) developed SAFI to provide teachers and coaches a means to evaluate their own behaviors and feedback during instruction. This type of systematic observation used self-evaluation and assessment to evaluate feedback given to the class or team. Each of these systematic observation systems were developed to help teachers enhance their overall teaching performance and student learning.

Academic Learning Time - Physical Education

The phrase "Academic Learning Time" was developed by Berliner in 1979, based on the Beginning Teacher Evaluation Study (BTES) which took place from 1972 through 1978 in California. During the multi-year series of studies, the focus of the research project shifted from identifying teaching competencies to the analysis of the connection that linked teacher behavior to student achievement (Brophy & Good, 1986). The study focused on the instruction in reading and mathematics classes for grades 2 and 5.

Throughout each subject and grade level, successful patterns of instruction were found (McDonald, 1976). Student engagement was found to be consistently related to effective teaching. Any teaching method that increased the amount of instructional time tended to increase learning (McDonald, 1976). Through the use of BTES, time on task and learning were associated. Allocated time and engaged time were developed as measures of instructional time. Allocated time refers to the time a teacher allocates for instruction and practice in a particular subject area. Engaged time refers to that portion of allocated time that a student is actually involved in a subject matter (Parker, 1986). BTES researchers then combined allocated time, engaged time and success rate into the concept of ALT (Brophy & Good, 1986).

Data obtained from the BTES research project showed a large variability across classes and students. The study found that two classes could have the same amount of time allocated to mathematics, yet differ in the amount of engaged time. It was also found that the higher the allocated time, the higher the level of engaged time (Williams, 1989).

Since the 1970s, quite a few studies have been conducted related to ALT. Weinstein and Mignano (1993) conducted a study which found that of the 1,000 hours per year of mandated academic time, only about 333 hours of that time was actual ALT. About 425 hours were considered engaged time and 500 hours were actual academic time. The researchers found that the need for an increase in ALT is essential in order to enhance student learning.

The concepts of ALT and its influence on student learning were an important part of the BTES. ALT is defined as the amount of time a student spends in class in relevant instructional activities at an easy level of difficulty (Dodds, Rife, & Metzler, 1982). Although the BTES study took place with mathematics and reading classes, researchers have shown that the ALT variable developed through the BTES study is also useful in the field of physical education (Graham, 1981). The ALT-PE coding instrument allows teachers to evaluate students in the physical education setting.

Studies using the ALT-PE coding instrument have been useful in improving both teaching skills and the amount of student engagement and learning. Birdwell (1980) measured the effects of teacher behavior changes on the

ALT-PE of students. Three inservice physical education teachers received instruction and daily feedback on their teaching behaviors. The intervention produced a decrease in management time and student non-engagement and an increase in teacher feedback. As the variables changed, student ALT-PE and ALT-PE (Motor) increased. This illustrated a direct relationship between teaching behavior and student ALT-PE.

Griffin (1986) studied the effects of ALT-PE supervisory feedback on the teaching behaviors of preservice physical education teachers. Subjects were videotaped in micropeer teaching sessions. The control group received conventional supervisory feedback, and the treatment group received instruction in and supervision through ALT-PE. A significant difference was noticed in the outcome behaviors of the two groups. Students of the treatment group teachers had higher ALT-PE, spent less time in transition and management behaviors, and more time in subject motor activity. Students in the control group had lower amounts of ALT-PE and spent a greater amount of time waiting.

Williams (1989) videotaped 12 student teachers who were teaching elementary physical education. ALT-PE was used to determine the percentage of teacher and student behaviors. He found that feedback in the classroom occurred at a rate of 1.26 episodes per minute. In a similar study using ALT-PE and elementary physical education teacher conducted by van der Mars, Cusimano, Darst, and Vogler (1994), it was found that feedback occurred at a rate of 3.2 episodes per minute.

The ALT-PE observation instrument focuses on the behaviors of the teacher and those of the student. With effective teaching, the level of student engagement increases. Also, with the increase in instructional time, an increase in student development and learning will occur.

Feedback

Feedback is a tool that serves primarily to increase learning, motivate learners, and reinforce behaviors (Christina & Corcos, 1988). It is an essential component of learning and performance and has been found to have a strong influence on a student's skill development and actions. Feedback tends to occur at a rate of 30-60 statements in a 30-minute period; most feedback is verbal in the form of positive, nonspecific evaluations; and is often single-student oriented (Fink & Siedentop, 1989; Fishman & Tobey, 1978; Pieron, 1983; Pieron & Cheffers, 1988; Siedentop, 1991; Silverman, 1991). Siedentop (1983) refers to feedback as information which is generated about a response that is used to modify the next response. There are three types of feedback: general, specific, and corrective. General feedback is given by a teacher to acknowledge that a particular student response did occur. It is a means of motivation for the student. Specific feedback is used to provide precise information on the student's response, and directly relates to performance. Corrective feedback is used in situations where the teacher provides students with information designed to remediate particular problems and to get them to change their next response (Ormond, 1992)

All three forms of feedback, when used effectively, will enhance the learning environment for students.

In the classroom environment, feedback can be delivered by the teacher, by a student-peer, or by means of videotapes with teacher-directed cueing. Teacher-delivered feedback plays an extremely important role when students are in initial skill acquisition (Schmidt, 1991). It should be immediate and specifically related to the characteristics of the movement pattern. Peer teaching can maximize the student's responsibility for his or her own learning and encourage cooperation among students. Boyce (1992) indicated that sometimes peer feedback is less effective than teacher-delivered or videotape feedback because the learner does not necessarily recognize the peer-teacher as being capable of delivering appropriate feedback. With this means of feedback, specific areas can be highlighted, feedback given, and performance improved. Videotaping can also to provide visual images for modeling and increase observational learning, increase motivation, and increase the effort levels in learning (Darden, 1999). Rothstein and Arnold (1976) found that students could benefit from videotaping used in conjunction with teacher-cueing on specific movement aspects. The video feedback with teacher directed cueing may help students improve their motor skill performance more effectively than peer or teacher feedback because the student can visually see themselves performing the activity and can see what needs to be corrected.

Boyce, Markos, Jenkins and Loftus (1996) studied the following types of feedback: teacher-directed, student-peer, and videotaping. Fifty-one students in third grade were studied during a 3-day skill development unit of volleyball, and 53 students in fifth grade were observed during a 3-day unit of tennis. The two classes were randomly assigned to either a video feedback, teacher feedback, or peer feedback group. For the third graders, it was found that teacher feedback helped students improve the most, followed by video-cueing and peer feedback. Third graders were more dependent on teacher feedback and less willing to accept feedback from their peers. With the fifth graders, the video-cueing feedback was where more improvement was evident than both the teacher and peer feedback groups. The video-cueing feedback helped students improve their performances more than either the teacher feedback or peer feedback. In this study, the younger the students, the better the performance following teacher-directed feedback.

Van der Mars (1988) examined the effects of audio-cueing on teacher behaviors. He studied a male physical education teacher with 5 years of teaching experience. Eighteen class sessions of second grade students were videotaped. An audio-cueing device was worn during teaching which gave cues to only the teacher. The cues consisted of short statements aimed at directing the teacher's attention to students' behaviors that could be praised. Examples of cues were to give praise to students, show appreciation to students who are reacting to the teacher, be specific, tell students what they did right, and be positive. The teacher also wore a wireless microphone so that verbal behaviors could be recorded. Four

videotapes were randomly selected at the end of the study. These were then used for data collection. The specific, positive skill feedback increased 500% during audio-cueing. Positive behavior feedback increased at the start of the audio-cueing phase but then gradually decreased. This study showed that with audio-cueing, teaching behaviors can improve.

Pellet, Henschel-Pellett, and Harrison (1994) conducted a study which also involved feedback and videotaping. They tried to determine if specific, corrective feedback had an immediate, positive effect on students' practice sessions. Sixty-eight female students in seventh and eighth grade volleyball units participated in the study. Students were tested on a variety of skills. All lessons were videotaped and coded to record the teacher's use of specific and corrective feedback and student's motor skill responses to each task both before and after receiving teacher feedback. For reliability, three lessons from each class were selected randomly and recorded using two videotape coders. The percentage of agreement for coding movement tasks, teacher-specific corrective feedback, and students' motor skill responses was 87% or higher for both coders. With feedback for the forearm pass, lower-skilled students showed a 17% improvement and higher-skilled students showed an 18% improvement. For sets, students doubled their practice success with corrective feedback. In serving, lower-skilled students' success rates improved from 41 to 49%, while higher-skilled students' practice success rates remained the same. From this study, it was found that motivation and reinforcement affect practice success. Teachers also need to provide students with

specific, corrective feedback at appropriate times.

In a similar study of low- and high- skilled students and practice success rates, Rikard (1991) found that successful task engagement was 70% for low-skilled students and 86% for high-skilled students in response to instructional tasks. After receiving teacher feedback, low-skilled students increased their practice success to 75% and high-skilled students declined to 84% . This study showed that high-skilled students were more successful at practice compared to low-skilled subjects before and after teacher feedback. Low-skilled subjects showed more change in practice success compared to high-skilled subjects after receiving feedback. Both of the above studies showed that with feedback, low-skilled students show more improvements in practice and success rates.

The amount of feedback given will affect the learning process of students. As teachers, the more cues that are given to students, the more difficult the learning process may become. Limiting the number of cues avoids overloading the learner with information. Boyce (1991) suggested the individual cue descriptions be brief. When presenting skills, it is helpful for teachers to use teaching cues that highlight the keys to effective skill performance. Teaching cues are usually planned ahead of the lesson or practice session, and should be the basis of the feedback during the practice phase of the lesson (Docheff, 1990). Cueing can cause almost immediate improvements in performances. Cues also increase the task at hand, the responses to situations, and movement of the class. Cues may be verbal or non-verbal. Verbal cues improve performance by drawing the attention

of the learner to the critical elements of the skills. Cues must be brief, accurate, related to the task, and appropriate to the nature of the task and ability level of the learner. Cues can be an effective strategy to insure that students get feedback as well as increasing the level of active involvement with the activity (Gorecki, 1997).

The amounts of feedback given to students can also depend on the teacher's experience. Tan (1996) found this to be true in his study of five experienced and five inexperienced elementary physical education teachers. Three lessons were videotaped and audiotaped. Transcripts were made for all verbal feedback, and each unit was coded using an observational system. This study indicated that inexperienced teachers did not differ from experienced teachers in their feedback structure, but do differ in their perceptual patterns. It was found that experienced teachers attend mostly to positive student cues and needs of students, and novice teachers focus on students' disruptive behaviors and interests. Experienced teachers gave an average of 2.17 feedback interventions per minute (every 27.6 seconds). Inexperienced teachers' intervention rates was 1.67 per minute (every 35.9 seconds). There were no differences found between experienced and inexperienced teachers in evaluative feedback, corrective feedback, or affective feedback. Experienced teachers attended to a greater number of cues than did inexperienced (85 versus 70), and focused on improvement and previous skill achievement. Inexperienced teachers focused on past skill performances. With experience, teachers will gain a greater focus on the

needs of the students and appropriate feedback for students.

With an increase in positive behavioral feedback, students' general class behavior can improve. As teachers, the goal should be to focus on the positive behaviors, give more feedback to students who are novices, and be more specific (van der Mars, Cusimano, & Darst, 1994). With these steps, teachers can improve the quality and effectiveness of feedback for students at all skill levels.

Preservice Teaching

A major goal of teacher education programs is to develop future teachers who can demonstrate effective decision-making tendencies and instructional behaviors in the interactive teaching environment (Brawdy & Byra, 1995). This can be accomplished through micropeer, peer teaching, and student teaching situations. All have been shown to dramatically increase the overall effectiveness of the future teacher.

Professionalism comes from experiential learning activities which take students beyond the classroom and place them in a real work environment, thus providing an opportunity to make the connection between theory and practice. At the core of these activities is "learning by doing" (Verner, 1993). Internships, student-teaching or practicum teaching provide students with the chance to practice the profession which they will be entering.

Siedentop (1983) stated that teaching must be viewed as a set of observable process skills to be practiced, evaluated, and reflected upon in order to improve future performance. Included in this process must be a means of systematic

observation and explicit feedback to preservice teachers.

Many studies have been conducted related to preservice teachers' performance, interaction with the class, teaching styles and overall teacher effectiveness. In 1991, Siedentop conducted a series of descriptive studies which revealed that physical education teachers generally spend 15% to 35% of class time managing students, 10% to 50% of the time giving instruction, 20% to 45% monitoring student activity without interaction, and 3% to 16% of the time in interactions (feedback) with the students. In similar settings, students are engaged in the following activities or behaviors: waiting (27%), management (15%-20%), receiving instruction (greater than 20%), and motor engaged/practice (25%).

Mancini, Wuest, and van der Mars (1985) conducted a series of intervention studies and reported that the addition of systematic supervisory feedback produced significant changes in teaching behaviors. With feedback, preservice teachers praised learners, accepted learner ideas, and posed questions to learners more frequently. The amount of feedback provided to learners increased, while the frequency of giving directions and criticizing learners decreased.

Mancini, Goss, and Fyre (1982) found that supervisory feedback improved both the quality and quantity of teacher interactions with their students. Brawdy and Byra (1995) found that goal setting, regular observation, feedback, and graphing were important variables in producing positive changes in student teachers' behaviors. They also found that with supervision, videotaping, feedback sessions, and a collaborative means of supervision preservice teachers could increase

positive specific interactions with learners while decreasing positive general interactions.

The process of systematically observing and giving explicit feedback to preservice teachers is crucial to their pedagogical development (Siedentop, 1983). To improve one's teaching ability, it has been found that systematic supervision and data-based feedback can enhance the teaching behaviors of student teachers. Smith and Steffan (1994) stated that systematic supervision involved gathering reliable and objective data on observable teaching behaviors using systematic observational instruments that provide student teachers with data-based feedback. Smith and Steffan (1994) videotaped four physical education teachers during 30-minute lessons. Using the Physical Education Teacher Assessment Instrument (PETA), it was found that intervention led to a decrease in student teacher management time.

Mancini et al. (1985) used systematic supervision to determine its impact on teacher behaviors and interaction patterns of physical education teachers. Using Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS), the teachers' videotaped lessons were evaluated. The findings indicated a strong support for the inclusion of instruction in systematic observation and supervisory feedback in preservice teacher education programs. The study also found that videotaping with feedback is beneficial to preservice physical educators.

Teaching is a skill and preservice teachers must actively practice sound pedagogical behaviors related to management and instruction. By allowing preservice teachers an opportunity to practice their teaching skills and analyze those skills either through systematic observation or videotape feedback, there is a much higher chance for improvement of one's teaching skills and abilities. By combining practical teaching experience with undergraduate course work early in college programs, students will develop appropriate teaching behaviors (Brawdy & Byra, 1995).

Summary

This review of literature focused on four primary areas: (a) systematic observation in physical education, (b) Academic Learning Time - Physical Education, (c) feedback, and (d) preservice teaching.

Daryl Siedentop and The Ohio State University led the way in the development of systematic observation systems to study and modify teaching behaviors. The systems which were developed included the OSU Teacher Behavior Rating Scale (Hughley, 1973), DACOME-PE (Rife, 1973), STOP (Dodds, 1973), and many others which incorporated the components of observation, recording, and analyzing interactions of both teacher and student. This means of evaluating teacher behavior was the answer to the education world's outcry for accountability in the classroom, including physical education.

The Ohio State University was one of the leading institutions in the research about student behaviors, time-on-task, student engagement and ALT.

Berliner (1979) first developed the concept of ALT, which was a result of the Beginner Teacher Evaluation Study that took place from 1972 to 1978. ALT includes allocated time, engaged time and success rate. Numerous studies have been conducted using ALT-PE as the main focal point. Many of these studies found that by using the ALT-PE coding instrument, significant improvements in teaching abilities, student engagement, and student learning can take place. Williams (1989) used the ALT-PE coding instrument with elementary student teachers and found feedback occurred at a rate of 1.26 episodes per minute. In 1994, van der Mars, Cusimano, Darst, and Vogler studied elementary physical education teachers and found that feedback using ALT-PE occurred at a rate of 3.2 episodes per minute. With effective teaching, student engagement increases and more learning can occur.

Feedback is an essential component of learning and performance.

Feedback tends to occur at rates of 30-60 statements in a 30-minute period. The majority of feedback is verbal and positive (Fink & Siedentop, 1989; Fishman & Tobey, 1978; Pieron, 1983; Pieron & Cheffers, 1988; Siedentop, 1991; Silverman, 1991). There are three types of feedback: general, specific, and corrective (Ormond, 1992). Many types of feedback enhance learning environments for students. A means by which effective feedback can be given is via videotape. Videotaping provides an effective modeling condition to provide visual images and increase observational learning, increase motivation, and increase effort levels in learning (Darden, 1999). Boyce et al. (1996) found that older students were

more effective in using videotape feedback than younger students. Van der Mars (1988) found that audio-cueing during teaching performance increased teacher positive skill feedback. Cues are a component of feedback which are used to highlight the keys of effective skill performance. Teaching cues should be the basis of the feedback during the practice phase of any lesson taught (Docheff, 1990). Cues can be an effective strategy to insure that students get feedback as well as increasing the level of involvement and learning during an activity (Gorecki, 1997).

Preservice teaching is a means by which future teachers can learn to develop and practice appropriate teaching behaviors and skills. A goal of preservice teaching is to "learn by doing" (Verner, 1993). Siedentop (1983) stated that teaching must be viewed as a set of observable process skills to be practiced, evaluated, and reflected upon in ensuring improved future performance. In 1991, Siedentop found physical education teachers spend 15% to 35% of class time managing students, 10% to 50% giving instruction, 20% to 45% monitoring students, and 3% to 16% interacting with students. Mancini et al. (1985) used systematic supervisory feedback and found significant changes in teachers' behaviors and students' ALT-PE. Other studies also found systematic supervisory feedback to improve teacher-student interactions, create a more positive teaching behavior, decrease student management time, and increase in student learning (Brawdy & Byra, 1995; Mancini et al., 1982; Mancini et al., 1985; Siedentop, 1983; Smith & Steffan, 1994). By allowing preservice teachers an opportunity to

practice their teaching skills and receive feedback, significant improvements in teaching behavior and student learning can occur.

Chapter 3

METHODS AND PROCEDURES

This chapter will describe the methods and procedures used for this investigation. The following is included within this chapter: selection of subjects, treatment of subjects, intraobserver agreement, testing instrument, procedures, methods of data collection, scoring of data, and treatment of data. At the conclusion of this chapter, a summary will be provided.

Selection of Subjects

The volunteers for this investigation were 54 preservice teachers enrolled in the Curriculum and Methods classes at a professional preparation college located in central New York. Informed consent was acquired from all 54 students (see Appendix A) who participated in the study. Subjects were assigned to either a control or treatment group by the investigator.

Treatment of Subjects

Fifty-four subjects were randomly divided into two groups by the investigator: a control group and a treatment group. All subjects were videotaped during each of their three 10-minute micropeer teaching sessions. During each micropeer episode, the teacher received periodic prompting from the investigator related to their micropeer teaching. All prompting was transmitted via a two-way wireless communication system. This system allowed the investigator to give prompts directly to the teacher while he or she was teaching. Other students in the

class were unable to hear the prompting given to the preservice teacher. Teachers in the control group received prompting regarding teacher movement and classroom management. Those teachers assigned to the treatment group received the same prompting related to teacher movement and classroom management but, in addition, they also received prompting pertaining to the use of prompts and cues, the frequency of student name use, and the type of feedback that was used. Only the investigator knew which group, control or treatment, the preservice physical education teacher was assigned to for the study.

During each teaching episode, all preservice teachers were videotaped. The first videotaped micropeer teaching session served as the baseline or pretest phase of the investigation. The second and third videotaped sessions served as the treatment phases. Following each videotaped teaching lesson, all students received individual feedback about their teaching performances from the investigator. Feedback was given during individual meetings where the videos were watched and evaluated. For the control group, feedback focused on teacher movement and classroom management. Subjects in the treatment group were provided with the same type of feedback, but also with feedback relating to the use of prompts and cues, the frequency of student name use, and the type of feedback which was used during their teaching lessons.

Intraobserver Agreement

Intraobserver agreement (IOA) scores were computed using the scored-interval agreement method (Hawkins & Dotson, 1975). Videotapes of each micropeer teaching were coded by Dr. Victor H. Mancini, an expert in descriptive-analytic coding techniques. IOA was calculated on an interval-by-interval basis and was computed by dividing the number of intervals where agreement took place by the number of intervals where there were agreements and disagreements. This number was then multiplied by 100 to yield a percentage (Herson & Barlow, 1976). The formula is given below:

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

Testing Instrument

The revised Academic Learning Time in Physical Education (ALT-PE) coding instrument was used to code the teaching behaviors of the preservice physical education teachers. The ALT-PE observation instrument was used to code the amount of time that students spent engaged in motor activity, learner involvement, and context within the physical education classes (Parker, 1989). The ALT-PE coding system is an interval recording system which entails a two-level system of decision-making regarding what happens within the classroom setting. The first level, or context level, focuses on the class as a whole and the specific individual student behaviors that occur. The context level is divided into

three areas. General content is the class time during which students are not intended to be involved in regular physical education activities. Subject motor knowledge content is the class time during which the primary focus is intended to be on knowledge. Subject matter motor content is class time where the primary focus is intended to be on motor involvement in the physical education activities. Within these three categories, there are 13 subdivisions which together represent the context level and describe the nature of the class environment. The second level, learner involvement, describes how individual learners are involved in the physical education setting. Learner involvement is divided into motor engaged and non-motor engaged categories. Eight subdivisions make up the learner involvement category (Parker, 1989), which focus on the individual students in the class.

Interval recording was used during the ALT-PE coding on a 6-second observe, 6-second record system. All data were recorded on ALT-PE coding sheets. All 54 videotapes were coded using ALT-PE and of the 54 tapes, two tapes from both the control and treatment groups were randomly chosen to determine IOA. Each student was coded on an interval system for each interval during the teaching lesson.

Procedures

Preservice teachers were videotaped three times throughout the semester during each micropeer teaching session. Each teaching session was 10 minutes in

length. Assignments for the teachings were arranged prior to the semester by the course instructor. Each student was responsible for the development of his or her own lesson plan.

During each micropeer teaching session, the students received periodic prompting from the investigator through the use of a two-way wireless communication system. The prompting was based on situations which occurred during the micropeer teaching session and the group to which the student was randomly assigned. The preservice physical education teachers were randomly assigned into either the control or treatment groups. The control group received general prompting concerning teacher movement, classroom management, class structure and class control. The treatment group received general periodic prompting, plus specific prompting regarding the type and frequency of feedback, the use of prompts and cues, and the use and frequency of student names.

Following the micropeer teachings, the students were required to attend an individual feedback session. Together the investigator and preservice teacher reviewed the videotape of the micropeer teaching session. Following the feedback session, Dr. Victor H. Mancini, an expert in descriptive analytic coding, coded the videotapes of the preservice teachers' teaching using the ALT-PE coding instrument. The ALT-PE data obtained from the first micropeer teaching and feedback session served as pretest data. The second and third sessions served as treatment phases, with the third session serving as posttest data.

Method of Data Collection

Data for analysis was obtained from the coding of each micropeer videotaped teaching session. Fifty-four tapes were coded using ALT-PE. From the 54 videotapes, two tapes from both the control and treatment groups were randomly selected to compute the IOA. Each videotape was coded by an expert coder, Dr. Victor H. Mancini, using the revised ALT-PE coding instrument.

Scoring of Data

The data collected from the ALT-PE coding of the 54 videotapes were scored manually. Percentages and ratios for the 21 ALT-PE categories were identified and calculated through the use of the ALT-PE coding instrument.

Treatment of Data

Descriptive statistics were used to compare the preservice teachers' observed and perceived behaviors from Phase I to Phase III. The ALT-PE coding instrument provided the necessary data to determine if changes in the subjects' teaching behavior following prompting occurred. Percentages from the ALT-PE categories were compared from Phase I to Phase III to evaluate the effects of periodic prompting on teacher behaviors. Prior to the start of the study, it was decided that a difference would be deemed significant if it was 5% or greater.

Summary

The subjects for this study were 54 preservice teachers enrolled in the Curriculum and Methods Physical Education classes. All students were randomly

assigned to either a control or treatment group. During the micropeer teaching sessions, all subjects were videotaped and received periodic prompting from the investigator via a two-way wireless communication system. The control group received prompting pertaining to teacher movement and classroom management. The treatment group received the same means of prompting as the control group but, in addition, received prompting pertaining to the use of prompts and cues, the frequency and use of student names, and the type of feedback given while teaching. Following each micropeer teaching session, the preservice teachers individually viewed their videotaped teaching sessions with the investigator. During the viewing, those subjects in both groups received feedback similar to the prompting which they received during their teaching sessions, which was based upon their assignment to either the control or treatment groups.

All videotapes were coded using the ALT-PE coding instrument and transposed into percentages calculated for analysis. Two videotapes from the control group and two from the treatment group were randomly selected to determine intraobserver agreement. The ALT-PE coding instrument was used to code the teaching behaviors of the preservice physical education teachers. Descriptive statistics provided data to determine if a change in teaching behaviors existed from Phase I to Phase III following periodic prompting and individual feedback sessions with the investigator. Prior to data collection, it was decided that a difference in behaviors had to be 5% or greater to be considered significant.

Chapter 4

ANALYSIS OF THE DATA

This study determined the effects of periodic prompting on preservice physical education teachers' interaction patterns, behaviors, and academic learning time of students as measured by the ALT-PE coding system during micropeer teaching sessions.

Intraobserver Agreement

In order to assess the reliability of the coder during the investigation, four videotapes, two from the control group and two from the treatment group, were randomly selected. Each videotape was coded twice during two different observation periods. IOA scores were computed using the scored-interval agreement method (Hawkins & Dotson, 1975). Videotapes were coded by Dr. Victor H. Mancini, an expert in descriptive-analytic coding techniques. IOA was calculated for each category of the ALT-PE system. IOA ranged from 98.4% to 100%, which was sufficient to indicate the coder was reliable.

Analysis of Data

Prior to the collection of data, it was decided that behavior differences had to be 5% or greater in order to be significant. Descriptive statistics were used to compare the student ALT-PE between the control and treatment groups during Phase I and Phase III of the investigation. Percentages were calculated for all ALT-PE categories and examined for significant differences. The ALT-PE

recording instrument is a two-level system composed of the context level which requires a decision based on the teaching situation under observation and the learner involvement level which is based on observations of students within the situation. The percentages for each level total 100%.

Table 1 illustrates the percentages and intervals for the ALT-PE categories.

Pre- and post-test data are shown for both the control and treatment groups.

Phase I of the investigation is represented by the pretest data. The context level is comprised of the general content, subject knowledge and subject motor behaviors. Little difference was evident at the context level between the control and treatment groups during Phase I. In the general content category, there were no significant differences among the categories between the control and treatment groups. Both the treatment and control pretest groups spent approximately 26% of the time in general content activity, 29% of their time in subject knowledge activities, and 44% of their time in subject motor activities.

The other level in the ALT-PE coding system is the learner involvement level. This level includes the non-engaged, motor engaged, and support categories.

At the learner involvement level during Phase I of the investigation, students spent approximately 67% of their time not engaged in activity and 32% of the time engaged in motor activities. Among the pretest control and treatment data, there were no significant differences at the learner involvement level. In Phase I, the total number of intervals for the control group equaled 1291 and 1286 for the

Table 1

ALT-PE Percentages for Control and Treatment Groups for Phase I and Phase III

| ALT-PE Category | Phase I | | Phase III | |
|--------------------------|---------|-----------|-----------|-----------|
| | Control | Treatment | Control | Treatment |
| General Content | 26.6 | 26.5 | 20.2 | 15.5 |
| Transition | 16.5 | 18.6 | 10.5 | 4.8 |
| Management | 6.5 | 6.3 | 5.4 | 4.0 |
| Break | 0.0 | 0.0 | 0.0 | 0.0 |
| Warm-Up | 3.5 | 3.6 | 4.3 | 6.7 |
| Subject Matter Knowledge | 29.1 | 29.1 | 31.4 | 32.9 |
| Technique | 20.8 | 20.6 | 24.1 | 23.3 |
| Strategy | 0.0 | 0.4 | 0.6 | 0.6 |
| Rules | 7.8 | 7.7 | 6.0 | 8.6 |
| Social Behavior | 0.0 | 0.0 | 0.0 | 0.0 |
| Background | 0.4 | 0.4 | 0.7 | 0.4 |
| Subject Matter Motor | 44.4 | 44.4 | 48.3 | 51.6 |
| Skill Practice | 37.8 | 38.3 | 38.2 | 47.0 |
| Scrimmage/Routine | 1.1 | 1.2 | 1.8 | 4.7 |
| Game | 3.3 | 3.2 | 6.6 | 1.2 |
| Fitness | 2.1 | 1.7 | 1.7 | 1.4 |

Table 1 (continued)

| ALT-PE Category | Phase I | | Phase III | |
|---------------------|---------|-----------|-----------|-----------|
| | Control | Treatment | Control | Treatment |
| Not Engaged | 66.5 | 68.7 | 60.5 | 50.7 |
| Interim | 0.3 | 0.2 | 0.0 | 0.1 |
| Waiting | 16.4 | 16.0 | 15.7 | 8.1 |
| Off-Task | 8.0 | 10.4 | 4.4 | 3.7 |
| On-Task | 10.2 | 10.8 | 11.8 | 7.7 |
| Cognitive | 31.5 | 31.3 | 28.5 | 31.0 |
| Motor Engaged | 33.5 | 31.3 | 39.5 | 49.3 |
| Motor Appropriate | 22.4 | 21.7 | 27.2 | 41.1 |
| Motor Inappropriate | 9.8 | 8.5 | 7.7 | 2.4 |
| Supporting | 1.3 | 1.1 | 4.1 | 5.8 |

treatment group.

In Phase III of the investigation, several categories showed significant differences when the posttest control data were compared to the posttest treatment data. The subcategory of transition showed that the control group spent more time in transition than the treatment group (10.5% versus 4.8%).

For the category of subject knowledge, there were no significant differences between the control and treatment groups. Both groups spent about 30% of their class time learning about techniques, strategies, and rules.

There were significant differences in two of the four subcategories for subject matter motor activity. The treatment group spent more time in skill practice than the control group (47.0% versus 38.2%). In the category of game play, the control group spent more time (6.6%) compared to the treatment group (1.2%).

The learner involvement level also showed significant differences in both the not engaged and motor engaged categories. The control group spent 60.5% of their time in non-engaged behaviors compared to 50.7% by the treatment group. The control group spent 15.7% of their time in the subcategory of waiting, and the treatment group spent only 8.1%. In the motor engaged category, the treatment group spent more time engaged in activity (49.3%) compared to the control group (39.5%). There were two subcategories that showed significant differences in the motor engaged category. The treatment group spent 41.1% of their time engaged in motor appropriate activity compared to 27.7% of the time for the control group.

The treatment group spent 2.4% of the time engaged in motor inappropriate activities, whereas the control group spent 7.7% of their time engaged in inappropriate activity. Significant differences were found in motor appropriate activity and ALT-PE between the control and treatment groups.

Summary

Prior to the investigation, it was determined that differences in behaviors must be 5% or greater in order to be considered significant. Percentages were calculated for all ALT-PE categories, based on 2582 observation intervals for the control group and 2577 observation intervals for the treatment group. IOA was calculated for each category of the ALT-PE coding system and ranged from 98.4% to 100%, which was significant to indicate the coder was reliable.

In Phase I of the investigation, there were no significant differences between the control and treatment groups at either the context or learner involvement levels. At the context level, the pretest control and treatment groups spent approximately 26% of the time in general content, 29% of the time in subject knowledge, and 44% of the time in subject motor activities. At the learner involvement level, 67% of the time was spent in non-engaged activities and 32% of the time in engaged activity.

Analysis of the data in Phase III of the investigation revealed numerous categories where significant differences were present among the control and treatment groups. At the context level, the control group spent more time in

general content (20.2% versus 15.5%). In the general content area, the subcategory of transition showed the control group spent more time in transition than the treatment group (10.5% versus 4.8%). In the subject motor area, the subcategory of practice indicated the treatment group performed more practice activity than the control group (46.9% versus 38.2%). The control group showed a higher percentage of activity in the subcategory of game play (6.6% versus 1.2%).

In the learner involvement level of Phase III, significant differences were seen in the following categories and subcategories: not engaged, waiting, engaged, motor appropriate, and motor inappropriate activity. The non-engaged category revealed the control group had higher non-engaged activity (60.5% versus 50.6%). The control group spent a greater amount of time waiting (15.7%) than the treatment group (8.1%). In the engaged category, the treatment group was more active (49.3%) than the control group (39.5%). The subcategory of motor appropriate activity revealed the treatment group had a larger level of motor appropriate activity or ALT-PE than the control group (41.1% versus 27.7%). The control group for the motor inappropriate level was higher (7.7%) than the treatment group (2.4%).

Those students who were randomly selected to the treatment group spent less time in transition, less time in game play but more time involved in skill practice activities, less time waiting, more time engaged in motor appropriate activity (ALT-PE), and less time engaged in motor inappropriate activity. As a

result of the data analysis, the null hypothesis was rejected. There were significant differences in preservice teaching behaviors between Phase I and Phase III of the investigation following intervention using audio-cueing and periodic prompting.

Chapter 5

DISCUSSION

The purpose of this investigation was to determine the effects of periodic prompting on preservice physical education teachers' interaction patterns, behaviors, and academic learning time of students as measured by the Academic Learning Time in Physical Education (ALT-PE) coding instrument. The ALT-PE coding instrument was used to collect data in this study. This chapter discusses the results of the study and compares this study to other related studies.

Throughout the study, the subjects received periodic prompting from the investigator via a two-way wireless communication system during micropeer teachings. The students in the control group received periodic prompting relating to teacher movement and classroom management. The students in the treatment group received the same prompting as the control group, with the addition of prompts that related to the use of prompts and cues, the frequency of student name use, and the type and frequency of feedback. Following each micropeer teaching session, each preservice teacher attended an individual feedback session with the investigator regarding the micropeer teaching performance.

Phase I of this study represented the pretest data. Analysis of the Phase I data revealed no significant differences between the control group and treatment group. Both groups spent about 26% of their class time involved in general

content activities. Both groups received information about 29% of the time. Students were engaged in various motor activities 44% of the time. Students were in non-engaged activities 66% of the time. For 33% of the time, students were engaged in motor appropriate, inappropriate or supporting activities. The total number of pretest control behaviors equaled 1291, and the pretest treatment behaviors equaled 1286.

Analysis of Phase III revealed that significant differences did exist following intervention. At the context level, the control group spent significantly more class time in transition than the treatment group (10.5% versus 4.8%). In the subject matter motor content, the areas of practice and game time showed significant differences. The control group spent 38.2% of their class time in skill practice situations compared to 46.9% spent by the treatment group. The treatment group spent only 1.2% of time in game situations, whereas the control group spent 6.6%.

At the learner involvement level, significant differences also existed following intervention. Under the non-motor engaged category, the control group spent 15.7% of their time waiting, and the treatment group spent only 8.1% of the class time waiting. For the motor engaged category, the control group spent 27.2% of class time engaged in motor appropriate activity compared to 41.1% for the treatment group. The treatment group spent less time engaged in motor

inappropriate activity than the control group, 2.4% compared to 7.7%:

From Phase I to Phase III, the control group significantly decreased their time in general content (26.6% versus 20.2%), including the time spent on transitions (16.5% versus 10.5%). The control group significantly decreased their nonengaged time (66.5% versus 60.5%) and significantly increased motor engaged activity (33.5% versus 39.5%). There was a significant increase in ALT-PE.

The treatment group decreased the amount of time they spent in general content (26.5% versus 15.5%) and transition (18.6% versus 4.8%) from Phase I to Phase III. The subject matter motor area increased (44.4% versus 51.6%), and skill practice decreased (38.3% versus 47.0%). A decrease existed in the non-engaged category (68.7% versus 50.7%) and ALT-PE was evident. A decrease (8.5% versus 2.4%) in motor inappropriate activity resulted following the study.

These differences supported the fact that following intervention, class time was spent more on practice activities, less on game play, less time in waiting situations, less time in transition, and more time was spent engaged in motor appropriate activity. The treatment group accrued significantly more ALT-PE than the control group. The total number of posttest control behaviors for Phase III equaled 1291 and the posttest treatment behaviors also equaled 1291.

Analysis of the pretest and posttest data indicate that preservice teachers exhibited improved teaching performance following periodic prompting. The

preservice teachers decreased transition time and waiting time during classes following periodic prompting. Less transition and waiting time meant the preservice teachers spent a greater amount of classroom time having students participate in activity that was motor appropriate and more skill or practice-orientated. One of the key points of preservice teacher preparation programs is to help preservice teachers learn how to engage students in the class in appropriate, meaningful activity while at the same time decreasing transition time which takes away from class participation.

The posttest data indicated that with periodic prompting and feedback following the micropeer teaching situations, students were more engaged in appropriate activity, allowing students more opportunities to increase their skills. The treatment group students were engaged in motor appropriate activities more than the control group. This indicated that the treatment group students accrued significantly more ALT-PE than the control group. This investigation also showed that audio-cueing, which provides immediate feedback, is an effective means of providing feedback. Audiocueing can be used to provide immediate feedback to preservice teachers, which has been shown to be more effective than delayed feedback. Preservice teachers typically receive delayed feedback, which is usually given at the conclusion of the lesson or even hours or days later.

The 1984 van der Mars' study looked at the effects of audio-cueing on

teaching behavior. It was this original study where van der Mars first began his work using an audio-cueing device. In this investigation he found that periodic prompting, feedback, and cueing increased the preservice teachers' use of names and frequency of feedback. The use of a communication system during teaching was beneficial in the development of a teacher's awareness and organization during teaching.

In 1988, van der Mars conducted a study to determine the effects of audio-cueing on teacher behaviors. Cues regarding teaching performance were given to the teacher via an audio-cueing device. Cues given to the teacher focused on student praise, specific feedback, corrective feedback, positive feedback and student appreciation. van der Mars found that during audio-cueing, specific positive skill feedback increased. It was also found that there was no change in time management. The current study determined that with the inclusion of audio-cueing, teaching behaviors can improve. The results of van der Mars' study supported the use and positive effect of audio-cueing and intervention on preservice teachers' behaviors.

The findings by van der Mars regarding audio-cueing and teacher behaviors were similar to those results in this study. Audio-cueing was effective in altering preservice teaching performance and enhancing students' ALT-PE. van der Mars (1984) recommended in his study that it be replicated having subjects teach

individual classes rather than team-teaching. The recommendation by van der Mars was used in this present study.

Birdwell (1980) evaluated the effects of instruction and daily feedback on teaching behavior and students' ALT-PE. The investigation studied three inservice physical education teachers and their students. Birdwell concluded that intervention produced a decrease in management time and student non-engagement. An increase in teacher feedback also occurred during the evaluation. As the variables changed, both student ALT-PE and ALT-PE (motor) increased. This study supported the direct relationship between teaching behaviors and student ALT-PE. Although the current study did not show a significant difference following intervention in management time, these data showed a significant decrease in transition time. The result of both investigations showed increases in ALT-PE.

Griffin (1986) studied the effects of ALT-PE supervisory feedback on teaching behaviors of preservice physical education teachers. The subjects were divided into two groups: the control group who received conventional supervisory feedback and the treatment group who received instruction and supervision through ALT-PE. The results indicated the treatment group had higher ALT-PE and spent less time in transition and management and more time in subject motor activity compared to the control group. The control group students had lower ALT-PE and

higher waiting time. Griffin concluded that the use of supervisory feedback results in positive teaching behaviors and more effective teachers, as indicated by accrued ALT-PE.

The studies of Birdwell (1980), Griffin (1986), and van der Mars (1984, 1988) all indicated that with intervention and feedback, preservice physical education teachers will increase their students' ALT-PE. These findings are similar to the findings of this investigation, which also revealed an increase in ALT-PE. Effective classroom teaching can be developed through strong teacher preparation programs.

Just as feedback is important and critical for student skill learning, feedback is important for preservice teachers' improvement of teaching skills. Increased learning, motivated learners, and reinforced behaviors all are results of appropriate use of feedback. Feedback can influence learning, performance, skill development, and actions of student. In the present investigation, following periodic prompting the treatment preservice teachers incorporated more feedback into their teaching. The beneficial effects of such feedback is reflected in the increased ALT-PE accrued by students in the treatment group.

Preservice teaching studies have supported the concepts of supervision while teaching, videotaping, and systematic supervisory feedback to be instrumental to the development of the preservice teacher. Siedentop (1991) found

that physical education teachers spend 15% to 35% of class time managing students. Siedentop also found teachers spend 10% to 50% of time giving instruction, 20% to 45% of class time monitoring student activity, and 3% to 16% of the class time in feedback interactions with students. It was also found that students spend 27% of class time waiting, 15% to 20% in management, over 20% of time receiving instruction, and 25% of class time engaged in practice activity. For teachers to be effective and students to increase their success rates, teachers need to manage their time efficiently throughout their classes. Teachers need to be aware of their class structures, teaching behaviors, and focus on student success in activities by increasing their engaged time, decreasing the amount of waiting time for students, focusing on management techniques, and increasing the use of feedback. The findings from this study revealed that following intervention teachers reduced the time their students spent waiting, more efficiently managed their classes, increased the time students were active in class, and enhanced the involvement of students in motor appropriate activities.

Mancini et al. (1985) support the idea of giving feedback to preservice teachers and reported that systematic supervisory feedback led to significant changes in teaching behaviors. Brawdy and Byra (1995) also found that systematic supervisory feedback, videotaping, feedback sessions, and a collaborative means of supervision results in increased positive, specific interactions with learners. Both

studies support the findings of the current study which reported increased student learning and opportunities for higher success rates following intervention.

The 1984 van der Mars' study on prompting was the similar to this investigation. Both studies investigated the effects of periodic prompting by means of a two-way communication system on selected preservice physical education teacher behaviors. Van der Mars found that periodic prompting increased the preservice teachers' use of names, positive skill feedback, and use of positive behavior feedback. It was also found that the use of a communication system during teaching was beneficial in the development of teacher behaviors. The present study used a two-way communication system that allowed preservice teachers to receive prompts based on their teaching performance. The prompting given to the preservice teachers focused on the teaching behaviors that were exhibited during the micropeer teaching setting. In agreement with van der Mars' study, prompting was found to be an effective means of providing feedback to preservice teachers to improve overall teaching performance.

Current teachers in the physical education field can benefit from peer or administrative feedback sessions as a means to improve their teaching behaviors. The sooner the feedback sessions take place following the observed class, the more effective the feedback will be for the observed teacher. The most effective way of critiquing one's teaching performance is through video-taping various classes and

observing the teaching behaviors as well as student behaviors.

Summary

This investigation studied the effects of periodic prompting on preservice physical education teachers' interaction patterns, behaviors, and academic learning time of students as measured by the ALT-PE coding instrument. Analysis of these data revealed that significant differences existed following intervention and prompting. Following prompting, students of preservice physical education teachers in the treatment group of this study spent significantly more time in skill practice situations, less time in game situations, and more time engaged in motor appropriate activity. The treatment group students also spent less time in waiting and less time engaged in motor inappropriate activity. Audio-cueing helped the preservice teachers to manage their time better, create additional opportunities for student learning, decrease time spent in transition and increase motor engaged time. Audio-cueing was an effective means to periodically prompt preservice teachers.

The findings of this study on the effects of periodic prompting on preservice physical education teachers supported the finding of earlier studies by Birdwell (1980), van der Mars (1984, 1988), Mancini et al. (1985), Griffin (1986), Siedentop (1991), and Brawdy and Byra (1995). The findings of this study also revealed that specific prompting is more effective than general prompting in the

development of preservice teachers' behaviors.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the effects of periodic prompting on preservice physical education teachers interaction patterns, behaviors, and ALT-PE of their students. Fifty-four preservice physical education teachers, enrolled in the Curriculum and Methods classes at a professional preparation college in central New York, were randomly divided into two groups: a control group and a treatment group. Each subject was videotaped during each of the three required 10-minute micropeer teaching lessons. During each micropeer teaching lesson, the preservice teacher received periodic prompting from the investigator by means of a two-way wireless communication system. Students in the control group received periodic prompting relating to teacher movement and classroom management. The treatment group preservice teachers received the same type of prompting as the control group with the addition of prompting relating to the use of prompts and cues, the frequency of student name use, and the type and frequency of feedback. Following each micropeer teaching session, each preservice teacher attended an individual feedback session with the investigator. This allowed both the investigator and preservice teacher an opportunity to review and critique the videotape of the micropeer teaching performance based on the

teacher's assigned group. The investigator also gave appropriate feedback to the preservice teacher.

ALT-PE was used to collect data on the subjects' teaching behaviors. Dr. Victor H. Mancini, an expert in descriptive analytic coding, reviewed and coded the videotapes of the preservice teachers using the ALT-PE coding instrument. The ALT-PE data obtained from the first micropeer teaching and feedback session served as pretest data. The second and third micropeer teaching sessions served as the treatment phase. The third micropeer teaching session also served as posttest data.

Each of the 54 preservice physical education teachers were videotaped during each of the three micropeer teaching sessions. Two tapes from the control group and two tapes from the treatment group were randomly selected to determine IOA. The four tapes were coded by Dr. Victor H. Mancini using the ALT-PE coding instrument and IOA was calculated and ranged from 98.4% to 100%, which was considered sufficient to indicate the coder was reliable.

Descriptive statistics were used to compare the preservice teacher behaviors from Phase I to Phase III of the investigation. Percentages from the ALT-PE categories were then compared to evaluate the effects of periodic prompting on teacher behaviors. Prior to the start of the investigation it was determined that the difference must be 5% or greater in order to be considered significant.

Analysis of these data indicated that periodic prompting via audio-cueing significantly affects preservice teachers' teaching behaviors and their students' ALT-PE. This investigation rejected the hypothesis that there would be no significant difference in the teaching behaviors or ALT-PE of students of preservice physical education teachers following periodic prompting. Prompting during micropeer teaching settings is effective in improving the teaching behaviors of preservice physical education teachers. The findings of this study support the findings of van der Mars' 1984 study that periodic prompting, feedback, and cueing alters preservice teachers' behaviors toward increased effectiveness. The findings also support the fact that use of a communication system during teaching is beneficial to the development of the preservice teacher.

Conclusions

The following conclusions can be drawn from this investigation:

1. Audio-cueing is an effective means of periodic prompting.
2. Specific prompting is more effective than general prompting in the development of preservice teachers' behaviors.
3. Immediate feedback is more effective than delayed feedback.
4. Significant changes were evident in the teaching behavior of preservice physical education teachers following periodic prompting. Those preservice teachers in the treatment group showed less time spent on transitions and game play. They reduced the time their students spent waiting and engaged in motor

inappropriate activity. The treatment preservice teachers devoted more time to skill practice, increased students engagement in motor activity, and enhanced students' ALT-PE.

Recommendations

The following recommendations are suggested for further study:

1. A study of the effects of audio-cueing and periodic prompting on the teaching behaviors of preservice physical education teachers in a six-session micropeer setting.
2. A study of the effects of audio-cueing and periodic prompting on the teaching behaviors of preservice physical education teachers during student teaching.
3. A study of the continued effects of audio-cueing and periodic prompting which was given during undergraduate professional preparation, on the teaching behaviors of first- year teachers.

Appendix A

INFORMED CONSENT FORM

1. Purpose of the study: To determine whether prompting will help the preservice teachers become more aware of their teaching performance and their students' learning.
2. Benefits: The subjects will receive feedback and prompting designed to improve their teaching performance. The feedback and prompting may assist the subjects to become more aware and effective as teachers.
3. What you will be asked to do: Each subject will be videotaped while teaching in a 10-minute micropeer setting six times throughout the year. Subjects will be asked to wear a wireless microphone to record verbal behavior. Subjects will also be asked to wear a two-way compact receiver with an earphone. This will allow the observer to communicate with the subject during the lesson. Neither piece of equipment will interfere with teaching activities. From each videotaped lesson, an experienced observer will code each student using the Academic Learning Time in Physical Education (ALT-PE) coding instrument. The ALT-PE coding instrument is designed to provide teachers with information on teaching behaviors, student engaged time in motor activity, learner involvement and context during class. All feedback will be privately given to each individual subject following each

micropeer session. Each feedback session will be conducted in the same manner as is currently followed in the Curriculum and Methods classes. All subjects will be told that they need to commit 20 minutes after each taping session to complete their feedback session. At the conclusion of the study, subjects will be asked questions concerning their teaching experience.

4. What you can expect to happen as a result of your participation in this study:

There are no foreseeable physical or psychological risks to the participating subjects due to this study. As a result of participation in this study, subjects will acquire a greater understanding of the importance of feedback when teaching.

5. If you would like more information about this study: Additional information can

be obtained through contacting Erika Backus (607) 257-8055, Mike DeMay (607) 272-1789, Dr. Mancini (607) 274-3176, or Dr. Wuest (607) 274-3108. All questions are welcomed and will be answered.

6. Withdrawal from study: Participation is voluntary. All subjects are free to withdraw at any time without penalty.

7. How will the data be maintained in confidence: All data will be confidential.

Once data is collected, the names of the subjects will be discarded and replaced by a subject number. Data will be analyzed by group, not

individual subjects. Taping is solely for the purpose of this study and will only be available to those conducting the study, Dr. Mancini, and the subject involved. When the study is completed, the tapes will be erased.

STUDENT INITIALS _____

I have read the above and I understand its contents. I agree to participate in the study.

PRINT NAME

SIGNATURE

DATE

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