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The Effects of Specific Teacher Training Program Components on the Self-Assessment Skills of Western Michigan University Physical Education Interns

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THE EFFECTS OF SPECIFIC TEACHER TRAINING PROGRAM COMPONENTS ON THE SELF-ASSESSMENT SKILLS OF WESTERN MICHIGAN UNIVERSITY PHYSICAL EDUCATION INTERNS

by

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The effects of an undergraduate self-assessment training program on the accuracy of self-assessment during physical education intern teaching was the focus of this study. Fourteen subjects enrolled in Intern Teaching at Western Michigan University and a university in central Michigan were studied.

The groups were compared on accuracy of self-assessment in selected teacher behaviors, teacher feedback rates, and student behaviors. Subjects were video-taped during intern teaching sessions and asked to complete the Self-Assessment Form (Hawkins & Wiegand, 1989). Estimates of percent time spent engaged in selected behaviors and feedback rates were compared to actual times and rates collected from the videotapes.

The findings of this study were that the WMU physical education interns were more accurate in self-assessment than the control group physical education interns. The WMU interns showed less variability in their estimations of behaviors and rates. The WMU interns were more consistent and had smaller ranges in their estimates.

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Finally, I dedicate this thesis to our daughter, Carlie Helena. I only hope that her education will be filled with effective teachers who love their work.

Jerry G. Bergsma

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CHAPTER I

INTRODUCTION

"Teaching is a set of complex, open skills ... All teachers should continue to develop their teaching skills throughout their careers as teachers" (Rink, 1993, p. 274).

These two statements provide a basic understanding of what it means to be a teacher. Teachers exist in a continually changing environment subject to influence from government, parents, administrators, colleagues, and students. Growth is necessary to keep up with change or even to be proactive in influencing positive change. Growth as a teacher is dependent on the ability to reflect on relationships, collect information to make judgments, and use this information to make change (Rink, 1993). This growth process requires self-assessment. Without accurate self-assessment, two main problems can arise. First, a belief that "experience is the best teacher" may obscure the self-assessment process. "Many teachers do not learn through experience - if this were the case, every teacher with 10 years experience would be a good teacher and this is obviously not so" (Rink, 1993, p. 274). Second, a belief in the trial-and-error method of change can influence teachers to "make the wrong change for the wrong reason" (Rink, 1993, p. 274).

Assessment of teaching performance is of vital importance to today's teacher. For a teacher to successfully create an optimal learning environment, assessment of current performance must be combined with

evaluation of the overall picture to give an indication of that teacher's effectiveness. Judging the effectiveness of a teacher has often been a subjective procedure (Medley, Coker, and Soan, 1984). Traditionally, physical education teachers have been judged "effective" if their students are happy, busy and behaving. While these student behaviors are desired by most teachers, they are not always indicative of learning. Accurately assessing the teaching performance of a physical education instructor is essential for the school, teacher and ultimately the student.

The physical education instructor is typically isolated from his or her professional peers within the school. The gymnasium is often set apart from the rest of the school. At the elementary level, children are dropped off by their teachers, and parents rarely know what actually happens in "gym class". At the secondary level, students attend physical education classes in a remote portion of the building returning to the mainstream following their classes. Evaluations by the principal or a school board member may happen sporadically throughout the year. Assessment of day to day performance is left up to the individual. "Did things go as I planned?", "How can I teach them to catch a grounder?", "Where should they line up for this activity?" are questions physical education teachers may ask after a teaching session. Most of the time they are left alone to struggle with solutions to complex questions.

In lieu of the above constraint analysis, Physical Education Teacher Education (PETE) Programs have an obligation to prepare teachers in self-assessment. Pre-service teachers are not typically taught to self-assess. Emphasis in most undergraduate curricula is focused on content and

instructional design. At Western Michigan University, physical education majors with the teacher-coach emphasis receive self-assessment training in preparation for the teaching internship experience. The teaching internship is the culmination of extensive content requirements and at least two "real-world" practicum assignments. Self-assessment of videotaped teaching sessions is required as a means of training and evaluating performance. Evaluation of exit skills of Western Michigan University graduates in physical education may shed some light on the effectiveness of their assessment training.

Statement of the Problem

The problem was to identify the effects of an undergraduate self-assessment training program on the accuracy of assessment during intern teaching.

Significance of the Study

A review of literature revealed that teacher training programs are continually trying to find the best methods to prepare future teachers. "There is substantial evidence that self-monitoring has utility as an assessment procedure and as a behavior modification technique" (Richards, 1976, p. 32). The task of analyzing physical education instruction has evolved dramatically as technology advances and school systems adapt their program design.

Systematic observation in physical education has gained popularity in the last 15 years as a means of objectively measuring behaviors in the

classroom. On systematic observation, Hans van der Mars (1989) states, "the answer(s) to the question of what typically goes on in school physical education classes could never have been given with the same confidence in 1970 as they can today" (p. 5). Teacher education programs in physical education such as the one at Western Michigan University are using a systematic observation system to prepare the teachers who graduate from the program. "Work reported indicates that self-study may hold promise as a useful means of sensitizing novice teachers to self-monitoring as a critical feature of reflective teaching" (Puoach, 1990, p. 34). Reflection includes the ability to think about why and what one does is vital to intelligent practice (Rink, 1993). Reflection on teaching through self-assessment can be a useful tool for growth and development of a physical education teacher. There has been little research that has investigated how teacher training effects the self-assessment skills of prospective teachers. This study attempts to determine if the intern teachers who are taught to systematically observe their performance are more accurate in their self-assessment than intern teachers who are not taught the same systematic self-assessment procedure.

Delimitations

The following were delimitations for the study:

1. The male and female subjects were teaching interns at Western Michigan University and a comparable teacher education program in central Michigan.

2. The video-taped sessions were at least 30 minutes in length.

3. The interns were video-taped during high school teaching sessions.

4. The self-assessment form was completed immediately following the teaching session.

5. The teaching internship followed the completion of all undergraduate requirements in the physical education curriculum.

Limitations

The following were limitations for the study:

1. The control group teaching interns were the entire population from one academic semester at one selected institution.

2. The Western Michigan University interns were randomly selected from a pool of interns that attended Western over the past 3 years.

Hypothesis

Western Michigan University physical education teaching interns will demonstrate more accurate self-assessment skills than the control group physical education interns.

Definition of Terms

1. Instruction: Teacher verbally describes, models, or physically guides a student in a subject matter task, skill or activity.

2. Monitoring: Teacher is watching student groups or individuals engaged in any category of student behavior.

3. Feedback: Teacher makes a statement (negative, positive, or

corrective) during or following student performance.

4. Management: Teacher is engaged in carrying out a non-subject matter task.

5. Motor appropriate activity: The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.

6. Cognitive: The student is involved in a cognitive learning task.

7. Management (Student): The student is engaged in carrying out an assigned non-subject matter task.

8. Waiting: Student is awaiting the next instructions or opportunity to respond.

9. Duration: For the purpose of this study, duration will be the amount of time engaged in a behavior.

10. Frequency: For the purpose of this study, frequency will be the number of times a behavior is observed.

11. Rate: For the purpose of this study, rate will be represented by the frequency of a behavior per minute.

12. Percentage: For the purpose of this study, percentage will be represented by the duration of one behavior divided by the total duration of all behaviors (multiplied by 100%).

13. Level: For the purpose of this study , level refers to discontinuity or shift in data across acceptability ranges.

14. Trend: For the purpose of this study, trend refers to the estimation performance of the interns across acceptability ranges (as acceptability decreases, the number of occurrences decreases).

Assumptions

The following were assumptions for the study:

1. The subjects were prepared to properly design a teaching session for physical education students.

2. The subjects understood the behavioral definitions provided by the researcher.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The review of related literature includes the following: (a) systematic observation procedures, (b) observational tools, and (c) self-assessment in physical education.

Systematic Observation Procedures

Introduction

Combining the value of self-assessment with the necessity of outside observation can give the intern a complete learning experience. Observation of intern teaching by the university supervisor must follow some basic guidelines in order to be effective and useful. An observer must decide what to observe, develop behavioral definitions, choose an observational tool, collect, analyze and interpret the data (van der Mars 1989, Rink 1993). For the purpose of this study, an observation system was chosen that utilizes the guidelines stated. Hans van der Mars(1989) cites numerous studies of how systematic observation has become "... not only a part of empirical research, but also a [means] in the preparation of novice teachers" (p. 5). Research in systematic observation has been important in validating the value of data collection procedures. "Much of the research aimed at changing teaching behaviors of both preservice and in-service

teachers used feedback as part of the intervention, and this feedback was typically based on data collected through systematic observation" (van der Mars, 1989, p. 8). A self-assessment inventory tool can be used in conjunction with valid, reliable data collected through systematic observation.

Deciding What to Observe

Selecting what to look at in a teaching session is dependent on what the observer deems necessary for improvement. Defining the real problem(s) and seeking possible solutions will be beneficial to a teacher seeking to improve performance. The "problem" in a physical education setting may be addressed effectively only when all information is looked at objectively. Modifying behaviors of students and teacher to produce a positive change should be the central motivation. Rink (1993) states that "teachers should think in terms of how their teaching can change student behavior in a positive direction" (p. 277).

Developing Behavioral Definitions

It is important to establish clear definitions of the behaviors to be observed. Defining the problem(s) will be impossible if agreement can not be reached as to what you are observing. Clear, complete, and objective definitions are necessary to minimize disagreement among observers. Siedentop (ALT-PE), Rink (OSCD-PE), van der Mars (TMAS) are leaders in the field who have developed observational systems that use behavioral definitions.

Choosing an Observational Tool

Once a decision has been made on what to observe, some practical concerns about reliability, practicality, and validity of the instrumentation must be addressed. For an observation system to be useful, it must be practical, provide objective information, collect valid data, and have the capacity to be used reliably. One observational tool is the DataMyte used in conjunction with a videotaped lesson. The DataMyte is a hand-held microprocessor that compiles frequency and duration information on selected behaviors. This observational tool is used in the teacher education program in physical education at Western Michigan University.

Collecting Data

The collection of data can be difficult for teachers while they are teaching. In the intern teaching setting, an observer from outside the class can collect the necessary information. When on their own, teachers interested in self-assessment can use audio tape, videotape, request help from other teachers, or students to aid in collecting valuable information about the teacher and students. Each method has advantages and disadvantages so decisions about which to use will be dependent on the teacher's situation.

Analyzing and Interpreting Data

Once the raw data has been collected, some evaluative judgments will have to be made about performance. The goal of changing behavior must remain the focus of the evaluation process. Evaluation can only be

made in light of certain variables. The evaluator must keep in mind the goals of the lesson that was observed, the student information (level, age) and the specific teaching situation of the lesson (place in the unit, type of activity).

Self-Assessment in Physical Education

Introduction

The underlying philosophy of self-assessment is that, "With some guidance and understanding of the process, any careful and thoughtful person can generate personal information, assess its usefulness, and draw conclusions from it that will be helpful" Clawson et al, 1992, p. 5). Determining the effectiveness of an intern teacher is a process that includes input from the cooperating teacher, the supervising professor, and the teaching intern. Self-assessment is one evaluation technique that is valid and useful in the intern teaching process. The rationale for using self-assessment and the implementation of this evaluation strategy will be discussed.

Rationale

Is self-assessment necessary for teaching interns in physical education? Researchers in physical education preparation programs have indicated that self-assessment is a necessary and effective means of developing teachers. "Proponents of self-analysis believe that people learn best by thoughtful analysis of their own behaviors, and that self-initiated changes are most likely to succeed" Randall, 1992, p. 19). Tsangaridou &

O'Sullivan (1994) concluded that, "The art of reflection can be a learned enterprise that can lead to professional growth and development" (p. 26). Ballinger (1993) extends the outlook and scope of self-assessment by stating, "Continual self-evaluation will assist teachers, regardless of experience level, become more effective teachers" (p. 18). There is little doubt that self-assessment has value to the educator, but Bressan & Weiss (1982) take the argument to the next level. They feel that to develop competence, self-confidence, and persistence in physical education interns, observational skills must be taught and trained in teacher education programs. Unfortunately, every teacher education program will have supervisors that are not always effective in their roles. Self-assessment can limit the damage done by an ineffective supervisor.

The use of a self-assessment process involving aspects of self-selection and control of teaching effectiveness goals would allow a student teacher to receive feedback on their teaching experience when university supervision is infrequent and the cooperating teacher is not trained in systematic supervision. (Devoe, 1990, p. 37) It is clear that self-assessment, in some shape or form, is essential for growth and development of teachers.

Implementation

Determining what to assess in the self-assessment procedure is dependent upon the experience and goals of the teacher. An intern, or beginning teacher, will probably be concerned with different variables than an experienced teacher. Research by Behets (1993) reveals that "Beginning

teachers, concerned with themselves, focus on teacher behavior to survive" (p. 93). Self-assessment often has its focus in changing the behaviors of teacher and student. The implementation of a self-assessment procedure must then address the goal of behavior change. "The criteria for self-assessment should focus on the student teacher obtaining an objective view of the teaching process with a clear idea of what should and could be done to improve teaching behaviors" (Devoe, 1990, p. 40). Implementing a self-assessment protocol is a viable method for enhancing the feedback an intern receives during the intern teaching process. Learning to accurately observe and detect teacher and student behaviors in the classroom will give the intern a more complete picture of the lesson for reflection and further analysis.

Observational Tools

Introduction

Traditionally, assessment of actual behavior in physical education classes has been accomplished by intuitive measures, anecdotal records, rating scales and checklists (Rink, 1993; van der Mars, 1989). "The limitations of the traditional techniques lie in their lack of objectivity, reliability, and specificity" (van der Mars, 1989, p. 6). Systematic observation is an attempt to increase reliability and validity of observation by operationalizing definitions and using quantitative data. Siedentop and his associates(1979; 1982) developed the observation tool Academic Learning Time - Physical Education (ALT-PE) to quantify the student behaviors in a physical education setting. ALT-PE was modified for use as

the West Virginia University Teaching Evaluation System and Feedback Taxonomy (Hawkins & Wiegand, 1982).

Academic Learning Time (ALT-PE) (Metzler, 1979; Siedentop et al, 1979; Siedentop et al, 1982)

This observational tool is one of the earlier methods of systematic observation used in the field of physical education. ALT-PE is a measure of time students "are involved with materials that are appropriate to their abilities, resulting in high success and low error rates" (Parker, 1989, p. 195). ALT-PE is based on motor learning theory that states:

> (a) learning is maximized in direct proportion to the number and types of opportunities, (b) learning is best accomplished by doing. (c) observation of someone else performing the skill will increase learning potential, and (d) practice must be at the appropriate difficulty level. (Siedentop, 1991 p. 46)

The ALT-PE observational instrument is capable of describing the context and the type of motor involvement of a sample of students. Teacher response data is not collected as part of observation and is such considered a limitation of ALT-PE (Parker, 1989). An observation system which defines and operationalizes student and teacher behaviors was developed at West Virginia University by Hawkins, Wiegand and Bahneman (1982).

Western Michigan University Observation System (Berkey, Cool 1986)

The observational system used in the physical education department for intern teachers is a modified version of the West Virginia University Teaching Evaluation System and Feedback Taxonomy

(Hawkins and Wiegand, 1982). Various systematic observation methods are taught as part of the undergraduate curriculum. The purpose of the observation system is to "provide a rich, empirical source of information that could inform evaluative judgments made by physical education professionals regarding their subject matter lessons and programs" (Hawkins & Wiegand, 1989, p. 277). The observation system used for the intern teaching evaluation provides information for evaluative judgment on teaching performance. Frequency and duration of specified teacher and student behaviors are recorded for evaluation. This information is acquired from a videotaped teaching session using a data collection instrument.

All data must be interpreted in light of the activity selected, placement within the unit, class size, total time and class type. Intern teachers predict the important student and teacher data from the lesson. These predictions are used as a comparison to the actual behavior data. Self-analysis, description of the lesson, areas of needed improvement, guidance for future lessons, and goal setting are all essential in the interpretation process. Observer and intern teacher meet after the teaching session to discuss existing competencies and alternative strategies.

Event Recording

"Event recording determines the occurrence or lack of occurrence of the behavior or event being observed" (Rink, 1993, p. 304). Frequency of selected behaviors gives the observer an indication of the quantity of a

desired response, such as teacher feedback. Usually several behaviors are recorded at the same time. Event recording will produce rate information (event occurrences per minute) for comparison with other teaching sessions. It is crucial that the behaviors being observed are clearly defined and that the observer has practice using the system. Judgment by the observer is limited to determining whether or not the behavior occurred. Valid and reliable data can be obtained with minimal training and clear behavior definitions.

Duration Recording

This systematic technique provides information on how time is spent or how much time is used to carry out a task. The observer must keep track of the beginning and ending of selected events or behaviors. Teacher and student behaviors can be tracked during a class period to produce time line of events. The sequence of events is observed and recorded for analysis. Duration recording is useful when the observer is tracking easily distinguishable behaviors or events that do not change frequently. Minimal training and established definitions are requirements for producing valid reliable data.

Summary

Teacher preparation in physical education has changed dramatically over the past 50 years to meet the educational needs of schools and changes in teaching philosophy. Social influences and improved methods have altered the product of today's teacher education programs. Scrutiny

of the teaching process and its products have encouraged supervising teachers to provide valid, reliable and useful data for intern teachers to use in their preparation for future teaching opportunities. Researchers indicate that systematic observation in the teacher preparation field can provide future teachers with the necessary tools to effectively self-assess teaching performance. Mancini, Wuest & van der Mars (1985) argue that self-analysis through directed observations can contribute measurably to the improvement of instructional effectiveness. Traditional observation techniques are limited in their value because of their lack of objectivity, reliability, and specificity. Systematic observation tools that can integrate various observation techniques are most effective in providing valid, reliable data. Two systematic observation tools that use self-assessment training have been described in the literature review. Accurate self-assessment and evaluation will increase the probability that a teacher will make necessary changes to improve performance and learning within the physical education setting.

CHAPTER III

METHODS AND PROCEDURES

Introduction

The problem of the study is to identify the effects of specific teacher training program components on the self-assessment skills of Western Michigan University physical education interns. Procedures are presented as follows: (a) human subjects approval, (b) subjects, (c) instrumentation, (d) procedures for collecting data, and (e) statistical analysis.

Human Subjects Approval

Approval for this study was obtained from the Human Subjects Institutional Review Board of Western Michigan University, Kalamazoo on March 9, 1993. Appendix A contains a copy of the letter (HSIRB Project Number 95-02-27). Written consent of subjects included in this study was obtained on March 16, 1995.

Subjects

Fourteen subjects were studied. The subjects were enrolled in Intern Teaching at Western Michigan University and a central Michigan university. The participants completed all requirements to fulfill the Teacher-Coach major at their respective institutions. Subjects included were male and female between the ages of 21 and 24. Each subject signed

an Informed Consent Form. Selection of the Western Michigan University students followed the selection of participants from the control group. Western Michigan University students selected were matched by gender to the students from the participating university.

Instrumentation

The participating students were required to be video-taped as partial fulfillment for credit in their respective programs. The participating intern teacher wore a portable, wireless microphone to ensure all comments and instructions were audible for classification.

Data Collection Device

The DataMyte is a hand-held electronic microprocessor used for frequency and duration recording of selected behaviors. This instrument is used for data collection of specified behaviors by members of the Department of Health, Physical Education and Recreation at Western Michigan University. Each of the 20 numbered buttons on the keyboard corresponds to a specific teacher behavior or specific student behavior. The 12 teacher response classes and 8 student response classes were taken from the Hawkins & Weigand (1989) system developed at West Virginia University. A list of the behavior code definitions along with modifications for this study are included in Appendix B. After all behaviors are coded, duration and frequency information can be extracted from the Datamyte. This information is entered on the Data Summary Sheet by the data collector. A copy of the Data Summary Sheet can be

found in Appendix C. Inter-rater reliability was established with two experienced instructors at Western Michigan University. These two instructors are graduates of the West Virginia University where the classification system was developed. The data summary sheets of the researcher and two instructors were compared to establish inter-rater reliability above 0.85 (agreements/agreements + disagreements).

Self-Assessment Form

The self-assessment form used in this study was a modification of the Self-Assessment Form (Hawkins & Wiegand, 1989) used by the Department of Health, Physical Education and Recreation at Western Michigan University. The self-assessment form is a post-teaching instrument administered by the observer. The participating intern teacher was asked to estimate the percentage of time teacher and students engaged in specified behaviors (Appendix D). An estimate of the rate(per minute) of positive reinforcement and corrective feedback provided by the teacher was also requested. A copy of the Teacher Self-Assessment Form can be found in Appendix E.

Procedures

Those students who choose to participate in the study were asked to sign an informed consent form (Appendix F). The students were given a brief explanation of the systematic observation procedure for teacher and student behavior. The data collection procedures were outlined. It was emphasized that student confidentiality will be maintained throughout

the study. Participants were assigned a code number only discernible by the researcher. Tapes were coded and held by the researcher until all data had been collected.

Data Gathering

Students participating in the teaching session were outfitted with a wireless microphone to allow the observer to hear specific comments or feedback. Data was gathered while observing teacher behaviors and student behaviors. The observation sequence was 2 minutes on the teacher, 1 minute on a student, 1 minute on a student, repeat. The observer randomly selected students on which to focus. The entire sequence continued for at least 30 minutes.

Data Recording

The research associate viewed the taped, teaching session to record selected teacher and student behaviors. The system used is a modified from the West Virginia University Teaching Evaluation System developed by Hawkins & Wiegand (1989). Each observed behavior has a corresponding numbered button on the Datamyte. The data was be recorded on this device while the tape was viewed. When the taped teaching session was completed, the data was extracted from the Datamyte and entered on a data sheet by the observer. Duration and frequency of behaviors, as estimated by the teacher on the Self-Assessment Form, were also recorded on the data sheet. Data was gathered on all participants and placed on a master sheet for statistical analysis (Appendix G).

Statistical Analysis

The purpose of this study was to examine the relationship between teacher training program components and the self-assessment accuracy of physical education intern teachers. Data was subjected to descriptive analysis as in a single-case research design. Initially, data was grouped by behavior categories to allow for visual inspection of the differences between groups. Data was graphed to establish differences in acceptability ranges and variability of estimates. Graphs were used to give visual affirmation of the anticipated trends established by initial inspection of data. Graphs were also used to help establish differences in trend and level between the two groups.

CHAPTER IV

RESULTS

Introduction

The data indicates that there was a difference in accurate estimation of teacher and student behaviors by interns in two comparable teacher education programs. The two methods used to describe these differences were acceptability ranges and variability of estimates. Acceptability ranges were a description of the number of estimations within a range closest to the actual behavior time observed. Variability of estimates were a description of the range of estimates for each behavior, the range of mean overall estimation, the patterns of over or under estimation for each behavior, and mean estimates for selected key behaviors.

Acceptability Ranges

Introduction

The difference in accuracy was detected by categorizing the observations into acceptability ranges. The difference in accuracy was initially detected by tallying the number of interns who estimated within the acceptability range for each selected teacher and student behavior. The acceptability range was subdivided by 5% increments on either side of zero (perfect estimate). Overestimation was represented by positive differences and underestimation was represented by negative differences. The results

were reported by describing the 0% to 5% (+/-) range for each behavior category and any other significant ranges. Graphs were created to give additional visual confirmation of the data trends. Differences in data trends and levels are described for each of the teacher (monitored, feedback, managed, instruction, "other", reinforcement rate, correction rate) and student (motor appropriate, cognitive, student management, waiting, "other") behavior categories.

Monitored

The Western Michigan University interns were more accurate than the control interns estimating time spent monitoring students. Table 1 shows that 39% (7 of 18) of the WMU interns were able to estimate within 5% (+/-) the monitoring time as compared to 22% (4 of 18) for the control group. Seventy-eight percent (14 of 18) of the WMU interns estimated within 15% (+/-) of actual monitoring time while 50% (9 of 18) of the control group interns estimated within 15% (+/-) of actual monitoring time.

Visual inspection of the graph (Figure 1, Appendix H) indicated a similar trend in estimation behavior between the two groups. The graph line of the WMU interns is positioned at a higher level than the line of the control group interns. The extreme change in level in the last acceptability range indicates erratic estimation performance by the control group interns.

Table 1

Number of Estimations in Each Acceptability Range for Monitoring

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	4	3	2	9
WMU	7	4	3	4

n = 18 for each group

Provided Feedback

The control group interns were slightly more accurate estimating time spent providing feedback to students. Table 2 shows that 33% (6 of 18) of the control group interns estimated within 5% (+/-) of the actual feedback time compared to 17% (3 of 18) of the WMU interns. However, within the 15% (+/-) accuracy range, both groups had the same number of observations (15) counted. The control interns displayed an optimal trend (ie., as acceptability decreased, the number of observations decreased) while the WMU group trend was reversed. The WMU group had a drastic change in level into the last acceptability range. (Figure 2, Appendix H) This change was positive in nature (ie., a decrease in observations in the worst acceptability range).

Table 2

Number of Estimations in Each Acceptability Range for Feedback

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	6	5	4	3
WMU	3	5	7	3

n = 18 for each group

Managed

The WMU interns were slightly more accurate in estimating time spent managing the class operations. Table 3 shows that 28% (5 of 18) of WMU interns estimated within 5% (+/-) of the actual feedback time as compared to 6% (1 of 18) of the control group interns. Seventy-eight percent (14 of 18) of WMU interns and 50% (9 of 18) of control group interns estimated accurately within the 15% (+/-) accuracy range. The estimates of the WMU interns displayed (Figure 3, Appendix H) a better trend than the control group estimates. The control group displayed a negative trend (as acceptability decreased, observations increased). The level of the WMU interns' estimates was consistent across ranges while the control interns' estimates were inconsistent, displaying an erratic

pattern.

Table 3

Number of Estimations in Each Acceptability Range for Management

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	1	6	2	9
WMU	5	4	5	4

n = 18 for each group

Instructed

The control group interns and the Western Michigan University interns were equally as accurate estimating time spent instructing students in subject-matter material. Table 4 shows that 44% (8 of 18) of the control group interns and 39% (7 of 18) of the WMU interns were able to estimate actual instruction time within 5% (+/-). The control group interns were slightly more accurate within the 15% (+/-) accuracy range.

Both groups displayed a similar trend and a similar level of estimates. (Figure 4, Appendix H) The estimation trend exhibited by the WMU group is slightly more ideal and has fewer estimations (7 as compared to 9) in the poor acceptability range. The control group

estimation pattern is more erratic as indicated by number of observations in the outlaying areas.

Table 4

Number of Estimations in Each Acceptability Range for Instruction

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	8	1	2	9
WMU	7	3	1	7

n = 18 for each group

Other Behaviors (Teacher)

WMU interns were slightly more accurate in estimating the percentage of time they spent engaging in other behaviors. Table 5 shows that 100% of WMU interns were able to estimate within 5% (+/-) of actual time as compared to 89% (16 of 18) of the control group interns. The remainder of the control group interns estimated within 10% (+/-) of the actual time.

The two groups displayed a similar level in estimation, however, the WMU intern estimates displayed a slightly better trend. (Figure 5, Appendix H) The trend displayed by the WMU group estimations is ideal because all of the estimations were in the best acceptability range.

Table 5

Number of Estimations in Each Acceptability Range for Other Teacher Behaviors

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	16	2	0	0
WMU	18	0	0	0

n = 18 for each group

Reinforcement Rate

The control group interns were slightly more accurate in estimating the number of reinforcers provided per minute to students. Table 6 shows that 22% (4 of 18) of the control group interns were able to estimate within 0.2 (+/-) as compared to 11% (2 of 18) of the WMU interns. Seventy-two percent (13 of 18) of the control group interns estimated within 0.9 (+/-) as compared to 50% (9 of 18) of the WMU interns.

The control group interns exhibited (Figure 6, Appendix H) a slightly better trend of estimation (ie., the control group line was more horizontal than the WMU line). The control group estimates were not as deviant from the trend line as the WMU group estimates. The control

group estimates were at a more consistent level.

Table 6

Number of Estimations in Each Acceptability Range for Reinforcement Rate

	Acceptability Range			
Group	0 - 0.2	0.3 - 0.5	0.6 - 0.8	>0.9 or <-0.9
Control	4	6	3	5
WMU	2	6	1	9

n = 18 for each group

Corrective Feedback Rate

WMU interns were more accurate in estimating the number of corrective feedback statements per minute to students. Table 7 shows that 33% (6 of 18) of the WMU interns were able to estimate within 0.2 (+/-) as compared to 22% (4 of 18) of the control group interns. Eighty-three percent (15 of 18) of the WMU interns estimated within 0.9 (+/-) as compared to 56% (10 of 18) of the control group interns.

The WMU interns exhibited a better trend of estimates. (Figure 7, Appendix H) The graph indicated opposing trends between the two groups. The WMU interns exhibited a positive trend and the control

group interns exhibited a negative trend. Both groups had a similar level of estimation behavior.

Table 7

Number of Estimations in Each Acceptability Range for Corrective Feedback Rate

	Acceptability Range			
Group	0 - 0.2	0.3 - 0.5	0.6 - 0.8	>0.9 or <-0.9
Control	4	1	5	8
WMU	6	7	2	3

n = 18 for each group

Motor Appropriate

The WMU interns were more accurate in estimating the percentage of time their students spent engaged in motor appropriate activities. Table 8 shows that 78% (14 of 18) of WMU interns were able to estimate within 15% (+/-) of actual motor appropriate time as compared to 28% (5 of 18) of the control group interns. While the control group was more accurate within the 5% (+/-) range, the remaining observations (72%) were not very accurate (>16% or <-16%). The graph (Figure 8, Appendix H) indicated that the WMU interns exhibited a better trend of estimates (ie.,

almost level as opposed to an upward sloping trend for the control group). The WMU estimates were at a more consistent level. The control group estimates indicated an "all or nothing" pattern of performance.

Table 8

Number of Estimations in Each Aceptability Range for Motor Appropriate Behavior

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	5	0	0	13
WMU	3	6	5	4

n = 18 for each group

Cognitive

The control group interns were more accurate in estimating the percentage of student time spent engaged in cognitive tasks. Table 9 shows that 44% (8 of 18) of the control group interns were able to estimate within 5% (+/-) of actual cognitive time as compared to 17% (3 of 18) of the WMU interns. Seventy-eight percent (14 of 18) of the control group interns estimated within 15% (+/-) of actual cognitive time while 72% (13 of 18) of WMU interns estimated within the 15% (+/-) accuracy range.

The graph (Figure 9, Appendix H) indicated that the control group exhibited a slightly better trend of estimation than the WMU group. Both groups had a similar level of estimation behavior.

Table 9

Number of Estimations in Each Acceptability Range for Cognitive Behavior

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	8	2	4	4
WMU	3	6	4	5

n = 18 for each group

Student Management

The WMU interns were more accurate in estimating the percentage of student management time. Table 10 shows that 44% (8 of 18) of the WMU interns were able to estimate within 5% (+/-) of actual student management time as compared to 11% (2 of 18) of the control group interns. Seventy-eight percent (14 of 18) of the WMU interns estimated within 10% (+/-) of actual cognitive time while 22% (4 of 18) of the control group interns estimated within the 10% (+/-) accuracy range.

Table 10

Number of Estimations in Each Acceptability Range for Student Management

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	2	2	4	10
WMU	8	6	0	4

n = 18 for each group

The graph data indicated (Figure 10, Appendix H) that the WMU group exhibited a positive trend in estimation behavior as opposed to the negative trend of the control group. Both groups displayed one sharp shift in level between ranges, however the WMU shift was positive while the control shift was negative.

Waited

The control group interns were more accurate in estimating the percentage of time students spent waiting to perform tasks. Table 11 shows that 44% (8 of 18) of the control group interns were able to estimate within 5% (+/-) of actual waiting time as compared to 39% (7 of 18) of

WMU interns. Ninety-four percent (17 of 18) of the control group interns estimated within the 15% (+/-) accuracy range while 83% (15 of 18) of WMU interns estimated within the 15% (+/-) accuracy range.

Table 11

Number of Estimations in Each Acceptability Range for Waiting

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	8	5	4	1
WMU	7	7	1	3

n = 18 for each group

The graph data indicated (Figure 11, Appendix H) that both groups exhibited a similar trend in estimation behavior. Both groups had a similar level of estimation behavior.

Other Behaviors (Student)

The control group interns were more accurate in estimating the percentage of time students spent engaged in "other" behaviors. Table 12 shows that 67% (12 of 18) of the control group interns were able to estimate within 5% (+/-) of actual time as compared to 33% (6 of 18) of WMU interns. Ninety-four percent (17 of 18) of the control group interns estimated within the 15% (+/-) accuracy range while 50% (9 of 18) of WMU

interns estimated within the 15% (+/-) accuracy range.

Table 12

Number of Estimations in Each Acceptability Range for Other Student Behaviors

	Acceptability Range			
Group	0 - 5%	6 - 10%	11 - 15%	>15% or <-15%
Control	12	2	3	1
WMU	6	1	2	9

n = 18 for each group

The graph data indicated (Figure 12, Appendix H) that the control group exhibited a slightly better trend of estimation behavior. The WMU group had a negative shift in level at the last acceptability range.

Acceptability Range Summary

Of the teacher behavior categories defined in this study, the WMU interns were more accurate in the estimation of percentage of time spent monitoring, managing, and other behaviors and corrective feedback rates. The control group interns were more accurate in the estimation of percentage of time spent providing feedback and reinforcement rates. There was no significant difference between groups for estimating

percentage of time spent instructing.

Table 13

Mean Number of Interns Who Estimated Within Each Acceptability Range

	Teacher		Student		Combined	
Range	Control	WMU	Control	WMU	Control	WMU
0-5(+/-)	6.1	6.9	7.0	5.4	6.5	6.3
6-10(+/-)	3.4	4.1	2.2	5.2	2.9	4.6
11-15(+/-)	2.9	2.7	3.0	2.4	2.9	2.6
>15(+/-)	5.6	4.3	5.8	5.0	5.7	4.6

n = 18 for each group

Of the student behavior categories defined in this study, the Western Michigan Univesity interns were more accurate estimating the time students spent in motor appropriate and management behaviors. The control group interns were more accurate estimating the time students spent in cognitive and "other" behaviors. There was no significant difference between groups for estimating the time students spent waiting to perform. Table 13 provides a summary of the mean number of interns who estimated within each acceptability range.

Variability of Estimates

Introduction

The acceptability range summary did not give a complete description of the differences in estimation behavior between the control interns and the Western Michigan University interns. Range of estimation for each selected behavior and behavior categories in general (teacher and student) indicated a clear difference in estimation behavior. Patterns in over and under estimation in key behaviors and mean estimates of selected behaviors gave indications of group accuracy in self-assessment.

Range of Estimates

Of the 12 behaviors identified in this study, the Western Michigan University interns had a smaller range of estimates in 11 of the 12. Of the 5 teacher behavior categories used in the study, Western Michigan University interns had a smaller range of estimates in all behaviors. The largest difference in range of estimates were in the monitored, managed, and "other" teacher behaviors. The smallest range of estimates were in the provided feedback and instructed behaviors. Table 14 shows that the WMU interns had a smaller range of estimates than the control interns in each teacher behavior category.

The WMU interns had a smaller range of estimates than the control group interns in both teacher feedback rate categories. (3.7 and 2.7 to 5.5 and 5.6)

Table 14

Range of Teacher Behavior Estimates

	Teacher Behaviors				
Group	Monitored	Feedback	Managed	Instructed	Other
Control	80	33	53	57	13
WMU	44	32	39	51	3

n = 18 for each group

Table 15 shows that the Western Michigan University interns had a smaller range of estimates than the control group interns in all student behavior categories except "other" student behaviors. In 4 of the 5 behaviors (motor appropriate, cognitive, managed, and waited) the range of estimates by the WMU interns was considerably smaller.

Patterns in Estimation

The data indicates that the control group tended to overestimate the time spent monitoring, giving feedback, instructing, and the rates of reinforcement and correction. The control group tended to underestimate their management time and the time doing "other" behaviors.

Table 15

Range of Student Behavior Estimates

	Student Behaviors				
Group	Mtr. Appropriate	Cognitive	Managed	Waited	Other
Control	80	50	71	48	20
WMU	38	36	34	34	46

n = 18 for each group

The data indicates that the Western Michigan University group tended to overestimate the time spent giving feedback. The WMU group tended to underestimate the time spent monitoring, managing, instructing, and "other" behaviors.The WMU group showed no prevalent tendency for estimating rates of reinforcement and correction. The data reported for the WMU group tended to be more evenly distributed. The control group showed a tendency to be more erratic in their estimation behavior. For most behaviors, the control group tended to clearly overestimate or clearly underestimate.

The data indicates that the control group tended to overestimate the time students spent in motor appropriate behavior, and cognitive behaviors. The control group tended to underestimate the time students

spent in management, waiting, and "other" behaviors. The data indicates that the WMU group tended to overestimate the time students spent in motor appropriate behavior and "other" behaviors. The WMU group tended to underestimate the time students spent in cognitive, management, and waiting behaviors. Both groups were erratic in their estimation behavior for the selected student behaviors.

Mean Estimation Variability

As a group, the Western Michigan University interns were less variable in their mean estimates of teacher behaviors, teacher feedback rates, and student behaviors. Table 16 shows that the WMU interns had a smaller range of mean estimates in all major categories. This data indicates that the control group had a tendency to be more erratic than in their estimation behavior.

Table 16

Range of Mean Behavior and Rate Estimates

Group	Teacher Behaviors	Feedback Rates	Student Behaviors
Control	22.7	3.5	24.4
WMU	16.8	1.5	17.5

n = 18 for each group

Variability of Estimates Summary

Estimation ranges, patterns in estimation behavior, and mean estimate variability gave a more complete description of the differences in estimation behavior between the control interns and the WMU interns. The data reported for both groups indicated that the WMU group was less variable and less erratic in their estimation behavior. This information, combined with the acceptability range summary provides the basis for making conclusions about the self-assessment accuracy of the interns who participated in this study.

CHAPTER V

DISCUSSION

Introduction

The results from this study indicated that there was a difference in self-assessment accuracy between the Western Michigan University (WMU) interns and the interns from the control group. As a group, the WMU interns were more accurate than the control group interns at estimating the percentage of time and rates of teacher and student behaviors. The results seem to support the hypothesis that Western Michigan University physical education teaching interns demonstrate more accurate self-assessment skills than the control group physical education interns. The remaining sections of the chapter will analyze the findings from this study, provide some recommendations for further study, and state conclusions garnered from the study.

Findings

The results from this study indicated that the WMU interns have developed more proficient self-assessment skills than the control group interns. As a result of the PETE Program at Western, WMU interns are familiar with the self-assessment procedure, and have been required to complete self-assessment forms as part of their undergraduate training.

The following are a summary of the findings of the study:

1. Thirty-five percent of WMU interns estimated within 5% (+/-) of the actual behavior time as compared to 36% of control interns. Sixty-one percent of WMU interns estimated within 10% (+/-) of the actual behavior time as compared to 52% of control interns. This summary of estimation behavior indicates a more consistent estimation pattern by the WMU interns. Accurate self-assessment by a group of interns is not only reflected by the performance in the best range, but by performance consistency. This overall consistency is a function of instruction and practice in self-assessment skills. The good overall estimation performance by the control group can be attributed to a number of interns whose strong performance balanced out the poor performers.

2. WMU interns had a smaller range of estimates than the control interns in 11 of 12 behavior categories. This finding supports the hypothesis in that the smaller range is an indication of overall consistency and accuracy. The smaller ranges by the WMU interns indicates a better understanding of self-assessment by all interns in the group.

3. WMU interns had a smaller range of mean estimates than the control interns for each of the 3 categories. (Teacher behavior, feedback rates, and student behavior) This data also supports the idea that WMU interns are more accurate at self-assessment than the control interns. The smaller mean range by the WMU interns indicates a consistent estimation performance by all interns in the group.

4. Overall, both groups of interns had approximately the same number of overestimates as underestimates. The significance of over or

under estimation lies in the specific behavior. For example, the fact that the control interns tended to overestimate time spent instructing and the WMU interns tended to underestimate time spent instructing sheds light on the interns' perceptions of what is happening in the gymnasium. One possible reason that the WMU interns tended to underestimate time spent instructing could be because of an expectation that they should reduce instruction time to be a more effective teacher. The same could be said for feedback (over), motor appropriate (over), managed (under), and waited (under). It appears that the significance of these specific behaviors is reflected in the estimation behavior of both groups of interns.

There were other significant findings concerning specific teacher and student behaviors. These findings are summarized as follows:

1. Twelve of 18 control group interns and 7 of 18 WMU interns overestimated the percentage of time spent monitoring students. The mean overestimate for the control group was 16.4 as compared to 8.4 for the WMU interns. More control group interns overestimated by a larger mean amount.

2. Sixteen of 18 control group interns and 11 of 18 WMU interns underestimated the percentage of time interns spent in class management behaviors. The mean underestimate for the control group was -16.3 as compared to -11.3 for the WMU interns. More control group interns underestimated by a larger mean amount.

3. Seventeen of 18 control group interns and 13 of 18 WMU interns overestimated the percentage of time students spent in motor appropriate behaviors. The mean overestimate for the control group was 30.5 as

compared to 12.4 for the WMU interns. More control group interns overestimated by a larger mean amount.

4. Fifteen of 18 control group interns and 13 of 18 WMU interns underestimated the percentage of time students spent in management behaviors. The mean underestimate for the control group was -28.1 as compared to -9.5 for the WMU interns. More control group interns underestimated by a larger amount.

Trends in estimation behavior can be a valuable indicator of accuracy in assessment. The degree to which group over or under estimates can shed light on the perception the intern has of behavior in his or her class. For example, 17 of 18 control group estimates overestimated the percentage of time students spent in motor appropriate activities for a mean overestimate of 30.5 % of actual time. This large overestimation may be the result of a misunderstanding of the behavior definition of "motor appropriate", a preconceived expectation of behavior, or wishful thinking on the part of the intern. An underestimate of the same amount by the intern would indicate a different perception of behavior in his or her class. A large underestimation may be the result of a misunderstanding of the behavior definition, a perceived expectation of behavior, or, poor observational skills.

Recommendations for Further Study

There was not a lot of current data available with which to make valid comparisons. This limitation may have been minimized by using more observations from which to collect data. More data would probably

reduce the effects of outlying estimations. More data would also give more validation to possible trends within a group of interns and give credence to the difference in level.

A second recommendation for further study would be to study the effects of self-assessment accuracy on lesson effectiveness. Self-assessment can become very useful if it is tied to reflection on the lesson. If a teacher can be taught to become more accurate on assessing behavior in the classroom, some evaluations about the lesson itself can be made. Determining if accurate self-assessment influences the effectiveness of future lessons would be beneficial to physical education teachers.

A third recommendation for further study would be to investigate if self-assessment can improve teaching effectiveness. When a teacher becomes more accurate in assessing behavior in the classroom, does he or she become a more effective teacher? Determining if effectiveness can be attributed to certain measurable behaviors would be beneficial to physical education teachers.

Conclusions

The results from this study indicate that Western Michigan University interns are more accurate than the control group interns at self-assessment of selected teacher and student behaviors. This conclusion can be made on the basis of two criteria. First, a higher percentage of WMU interns than control interns estimated within the better acceptability ranges and a smaller percentage of WMU interns than control interns estimated within the poorer acceptability ranges. Second, the

WMU interns showed less variability in their estimations of behavior.

The results from this study also indicate that the self-assessment accuracy of Western Michigan University interns is a product of specific teacher training components within the undergraduate program. Self-assessment is an integral part of the evaluation process for the students in the Western Michigan University physical education program. As part of requirements in three courses, WMU students are required to complete a self-assessment questionnaire. The self-assessment procedure is often combined with videotape analysis of a teaching session. At Western, this is required a minimum of 6 times in the span of a year. The control group interns are not given specific self-assessment training in their undergraduate curriculum. The control group interns are not required to complete any type of videotape analysis. Various self-assessment techniques are taught as a part of the curriculum but not to the extent or exclusivity the Western undergraduate's experience.

Program design and philosophy is very influential in determining exposure to self-assessment techniques. Western Michigan University provides opportunity and training in self-assessment techniques that many universities do not afford. The impetus to improve as a teacher is based on empirical, self-assessment data. The data is used to develop strategies that increase the intern's feeling of control over classroom behaviors. The data indicates that this training does make a difference in the estimation accuracy of its interns. An intern who can accurately self-assess has a higher probability of developing and maintaining effective teaching characteristics than an intern who is inaccurate.

Appendix A

Human Subjects Institutional Review Board Approval

HSIRB Protocol Outline

The purpose of this project is to investigate the effects of specific teacher training program components on the self-assessment skills of Western Michigan University physical education intern teachers. Participants will be video-taped by the primary investigator in three consecutive, thirty minute, teaching sessions. A post-session self-assessment questionnaire of perceived performance will be administered by the investigator and completed by the teaching intern. Videotaping will be done in various schools in western Michigan during the Winter/Spring 1995 semesters as partial fulfillment of intern teaching requirements specified by the Department of Health, Physical Education, and Recreation of Western Michigan University and Calvin College.

Participants will receive quantitative feedback on specific teaching components after the data is collected. This feedback will be a direct professional benefit facilitating their skill development. Subjects will obtain useful information for future reference or study on systematic observation techniques.

Subjects in the control group will be chosen from a group of intern teachers enrolled in the teacher education program at Calvin College in central Michigan. Western Michigan University subjects will be randomly selected to match by gender participants from the control group. The Chairpersons of the Department of Health, Physical Education and Recreation at each institution have given preliminary approval for their students to participate as an extension of existing requirements within each program.

Subjects may experience risks as part of being involved in this study. Subjects may be inconvenienced by the requirement to be evaluated in three consecutive teaching sessions.

Subjects involved in this study will be protected from possible risks or discomfort at all times. The subject will be given the opportunity to select the teaching sessions that best fit his or her schedule.

The participants involved in this study will be randomly assigned a number identifiable only to the principal investigator and the research associate before any data is collected. The list of names and code numbers will be destroyed following the report of individual data to each subject.

Participants will be asked to complete the "Teacher Self-Assessment Form" (enclosed) after each teaching session. Data will be collected from the videotape using the "DATAMYTE" instrument. The Datamyte is a hand-held microprocessor that compiles frequency and duration information of selected behaviors. Behavior code definitions are attached along with modifications for the study. All data will be entered on a master sheet for summary.

Human Subjects Institutional Review Board

Kalamazoo, Michigan 49008-3899
616 387-8293

WESTERN MICHIGAN UNIVERSITY

Date: March 9, 1995

To: Bergsma, Jerry G.

From: Richard Wright, Interim Chair

Re: HSIRB Project Number 95-02-27

This letter will serve as confirmation that your research project entitled "The effects of specific teacher training program components on the self-assessment skills of Western Michigan University physical education intern teachers" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you must seek specific approval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date. In addition if there are any unanticipated adverse or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: Mar 8, 1996

xc: Berkey, Debra S., HPER

Appendix B

Behavior Code Definitions

TEACHER BEHAVIOR CODE DEFINITIONS

General Observation (1)	Teacher is watching student groups or individuals engaged in any category of student behavior. The teacher must not be engaged in any other category of teacher behavior in order to record "general observation". This category includes passive supervision and there is no relationship of the observation to an instructional focus.
Negative Feedback (2)	Teacher makes a statement during or following student performance which relates to the response and is negative in nature. The remark is designed to alter the quality of the student's response.
Reinforce (3)	Teacher makes a positive verbal statement or gesture following an appropriate student behavior (skill or organizational) clearly designed to increase or maintain such responses in the future. The reinforcer must follow soon enough after the behavior that the student clearly associates it with the behavior.
Corrective Feedback (4)	Teacher makes a statement during or following a student's response which is clearly designed to improve the quality of the response. The statement may be neutral or positive.
Managerial (5)	Teacher is engaged in carrying out a non-subject matter task (setting up equipment, taking roll, collecting papers, etc.) Teacher may be directing students verbally in a management task.

Instruction (6)	Teacher is verbally describing to the students how to do a skill or is using a verbal prompt to direct students in attempting a skill or activity. The activity must be a subject matter task to record instruction.
Modeling (7)	Teacher demonstrates to students how to do a subject matter task or participates with students in a subject matter task or activity.
Physical Guidance (8)	Teacher physically guides students through a subject matter task or activity. A physical guidance prompt or spotting as long as there is physical contact are examples of physical guidance.
Non-Task Verbal (9)	Teacher talks to students about non-subject matter and/or non-managerial subjects.
Off Task (10)	Teacher is not paying attention to what are clearly his/her responsibilities regarding the class at hand.
Specific Observation (11)	Teacher is watching one student engaged in a subject matter task for the purpose of providing feedback related to performance. Specific observation could be scored when teacher is watching pairs or small groups when the instructional focus is clearly on a group task.
Punishment (12)	Teacher makes a statement or gesture that is clearly designed to decrease the probability that the student response during which or after it occurs will not occur again.

MODIFICATIONS

For the purpose of this study the following modifications will be used:

Monitoring	- combine behaviors 1 and 11.
Feedback	- combine behaviors 3 and 4.
Managing	- behavior 5.
Instruction	- combine behaviors 6, 7, 8.
Other	- combine behaviors 2, 9, 10, 12.

STUDENT BEHAVIOR CODE DEFINITIONS

Motor Appropriate (13)	The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.
Motor Inappropriate (14)	The student is engaged in a subject matter oriented motor activity but the activity-task is either too hard for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.
Supporting (15)	The student is engaged in a subject matter motor activity the purpose of which is to assist others learn or perform the activity.
Cognitive (16)	The student is appropriately involved in a cognitive task.
On-Task (17)	The student is appropriately carrying out an assigned non-subject matter task (a management task, a transition task, a warm-up task).

Off-Task (18)	The student is either not engaged in an activity s/he should be engaged or is engaged in an activity other than the one s/he should be engaged.
Interim (19)	The student is engaged in a non-instructional aspect of an ongoing activity.
Waiting (20)	Student has completed a task and is awaiting the next instructions or opportunity.

MODIFICATIONS

For the purpose of this study the following modifications will be used:

Motor appropriate activity	- behavior 13.
Cognitive	- behavior 16.
Management	- behavior 17.
Waiting	- behavior 20.
Other	- combine behaviors 14, 15, 18, 19.

Hawkins, A. H., & Wiegand, R. L. (1989). West Virginia University Teaching Evaluation System and Feedback Taxonomy. In P. W. Darst, D. B. Zakrajsek & V. H. Mancini (Eds.). Analyzing Physical Education and Sport Instruction (2nd ed.) (pp. 280-281). Champaign Il: Human Kinetics.

Appendix C

Data Recording Form

DATA RECORDING FORM

STUDENT CODE # _____OBS.# ___ UNIT _____

Teacher	Duration	Frequency	%	Pred. %	Rate	
Behavior					Act.	Pred.
Monitor (1+11)						
Negative F (2)						
Reinforcement (3)						
Corrective F (4)						
Management (5)						
Instruction (6+7+8)						
Other (9+10+12)						
Total						
Student	Duration	Frequency	%	Pred. %		
Behavior						
Motor Approp. (13)						
Cognitive (16)						
Management (17)						
Waiting (20)						
Other (14+15+18+19)						
Total						

Appendix D

Teacher Self-Assessment Form

Teacher Self-Assessment Form

# of students ____ grade level ___ unit/activity ____

I. Estimate the percentage of time you spent in each of the following behavior categories during the class you just taught; the total of all categories must equal 100.

a. Monitored the class operation ____

b. Provided feedback to students ____

c. Managed the operations of the class ____

d. Provided instruction ____

e. Other ____

Total 100

II. Estimate the rate(per minute) at which you engaged in the following behaviors.

a. Reinforced students(positive) __.__

b. Provided corrective feedback __.__

III. Estimate the percentage of time your students engaged in the following behaviors during the class you just taught; the total of all categories must equal 100.

a. Engaged in motor appropriate activity ____

b. Engaged in cognitive behavior ____

c. Engaged in management behaviors ____

d. Waited their turn to perform ____

e. Other ____

Total 100

Appendix E

Self-Assessment Definitions

Self-Assessment Definitions

I. Teacher Behaviors

a. Monitored - Teacher watched student groups or individuals during the class period. Monitoring spans passive supervision to observation for the purpose of providing feedback.

b. Feedback - Teacher made a statement or gesture that is negative (to change performance), positive (to encourage/ reinforce), or corrective (to improve quality).

c. Managed - Teacher carried out a non-subject matter task or directed students in a management task (ie. taking roll, setting up equipment).

d. Instructed - Teacher verbally described, demonstrated or physically guided students in a subject matter task.

e. Other - Teacher was off-task or talked to students about non-subject matter material.

II. Teacher Feedback Rates

a. Reinforced - Estimate the number of occurrences (times) per minute.

b. Corrective - Estimate the number of occurrences (times) per minute.

III. Student Behaviors

a. Motor Appropriate - Student was engaged in subject matter tasks in such a way as to produce a high degree of success.

b. Cognitive - The student was involved in a cognitive task (ie. listened to directions, watched a demonstration).

c. Managed - The student carried out an assigned non-subject matter task (ie. transitions, warm-ups).

d. Waited - Student completed a task and was awaiting the next instructions or opportunity.

e. Other - The student was engaged in an activity that was, too easy or too difficult, of assistance to another student, off-task, a non-instructional aspect of an ongoing activity.

Appendix F

Cover Letter

Western Michigan University
Department of Health, Physical Education, and Recreation

Principal Investigator: Dr. D. S. Berkey

Research Associate: Jerry Bergsma

I have been invited to participate in a research project entitled "The effects of specific teacher training program components on the self-assessment skills of Western Michigan University physical education intern teachers." I understand that this research is intended to study how teacher training effects the accuracy of self-assessment of intern teachers in physical education. I further understand that this project is Jerry Bergsma's master's project.

My consent to participate in this project indicates that I will be asked to provide three videotaped teaching sessions for data collection purposes. I will be asked to complete a self-assessment form immediately following each teaching session.

As in all research, there may be unforeseen risks to the participant. If an accidental injury occurs, appropriate emergency measures will be taken; however, no compensation or treatment will be made available to me except as otherwise specified in this consent form. I understand that one potential risk of my participation in this project is that I may need to provide a number of possible times for videotaping. I understand, however, that Jerry Bergsma is prepared to make necessary schedule adjustments to best fit the needs of the participant.

One way in which I may benefit from this activity is having the chance to receive quantitative feedback on specific teaching components within my teaching sessions. I may also receive useful information for future reference or study. I also understand that I will be involved in an unbiased evaluation technique intended to improve teaching performance.

I understand that all the information collected from me is confidential. That means that my name will not appear on any papers on which this information is recorded. The forms will all be coded, and Jerry Bergsma will keep a separate master list with the names of participants and the corresponding code numbers. Once the data are collected and analyzed, the master list will be destroyed. Videotapes will be returned immediately following data collection. All other forms will be retained for three years in a locked file in the principal investigator's laboratory.

I understand that I may refuse to participate or quit at any time during the study without prejudice or penalty. If I have any questions or concerns about this study, I may contact either Jerry Bergsma at 248-3782 or Dr. D. S. Berkey at 387-2705. I may also contact the Chair of Human Subjects Institutional Review Board at 387-8293 or the Vice President for Research with any concerns that I have. My signature below indicates that I understand the purpose and requirements of the study and that I agree to participate.

_____ _____

Signature Date

12 April 1995

Dear Cooperating Teacher:

On behalf of Western Michigan University and the Department of Health, Physical Education and Recreation, I would like to extend to you an invitation to participate in a research project studying the self-assessment accuracy of intern teachers. The interns under your supervision will be videotaped during three(3) teaching sessions for the purpose of observing teacher and student behaviors which occur in the class. After each session, the intern will complete a self-assessment inventory to estimate percentage of time spent engaged in selected behaviors. Each videotaped session will be approximately 30 minutes in length. If you have any questions or concerns please feel free to discuss this project with Dr. M. Zuidema at Calvin College, or please call Jerry Bergsma at 248-3782. Again, the Department of Health. Physical Education and Recreation appreciates your support and cooperation.

Respectfully,

Dr. Debra S. Berkey
Principal Investigator

Jerry G. Bergsma
Research Associate

Appendix G

Observation Data

Teacher Behavior Data Summary

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P
1		Monitored		Feedback		Managed		Instructed		Other		Reinforced		Corrected	
2	Code #	Act	Pred	Act	Pred	Act	Pred	Act	Pred	Act	Pred	Act	Pred	Act	Pred
3	A0011	31	25	10	30	28	20	19	20	13	5	1.1	3.5	1.4	3
4	A0012	30	30	10	20	31	20	29	30	0	0	1.1	2	1.1	2
5	A0013	15	20	7	20	54	35	24	25	0	0	0.8	2	0.7	2.5
6	A0021	19	50	4	15	25	15	53	20	0	0	0.8	1	0.4	0.5
7	A0022	19	50	6	15	30	15	43	20	2	0	0.6	1	0.9	2
8	A0023	44	70	3	0	25	5	22	25	6	0	0.3	0.5	0.4	0.2
9	A0031	31	40	11	20	37	7	20	33	1	0	1.5	0.3	1	0.3
10	A0032	25	30	7	20	40	20	27	30	1	0	1	0.5	0.6	0.5
11	A0033	34	20	13	40	28	10	25	30	1	0	1.9	1	1.2	0.5
12	A0041	20	25	8	25	41	40	31	10	0	0	1.6	2	0.9	5
13	A0042	60	25	11	25	19	25	12	25	0	0	1.7	6	1.5	2
14	A0051	35	15	10	20	29	20	25	45	1	0	1.5	1.1	0.8	0.2
15	A0052	64	15	6	10	29	45	1	25	0	5	0.4	0.3	1.7	0.2
16	A0061	61	80	2	5	30	10	7	2	0	3	0.5	1.1	0.6	0.5
17	A0062	60	75	13	5	21	10	5	10	0	0	0.5	1	1.9	0.5
18	A0071	3	25	7	5	15	5	75	65	0	0	1	0.5	1.4	4
19	A0072	11	19	6	4	26	2	58	75	1	0	0.7	0.8	1.1	3
20	A0073	49	70	11	15	40	3	1	12	0	0	1.5	4	1.3	2
21															
22															
23	B0021	37	55	9	10	18	20	36	15	0	0	0.7	2.5	1.1	1
24	B0022	53	35	7	20	14	20	25	6	1	0	1.1	1	1.1	2
25	B0023	19	30	3	20	2	15	74	45	1	0	0.7	1	0.8	0.5
26	B0041	49	45	12	25	25	15	11	10	2	0	4.2	2.5	2.5	2
27	B0042	35	35	6	25	23	10	36	30	0	0	2.5	2	1.6	2
28	B0071	38	40	5	20	33	10	19	30	3	0	2	2	0.7	1
29	B0072	50	30	7	15	9	25	33	30	1	0	1.7	2	0.8	3
30	B0073	38	30	9	25	14	10	37	35	0	0	1.5	2	0.6	0.1
31	B0081	13	10	18	5	12	10	56	75	0	0	0.9	2	1.9	2
32	B0082	17	10	2	15	15	5	62	80	1	0	1	0.2	0.1	0.3
33	B0083	19	5	3	10	19	5	58	80	0	0	2.4	1	0.3	2
34	B0174	42	40	12	5	13	15	31	40	0	0	2.2	1	1.3	1
35	B0211	32	10	20	10	13	10	33	30	0	0	2.6	1.5	0.5	0.5
36	B0212	22	15	6	10	22	30	48	45	1	0	2.4	2	1.2	0.5
37	B0213	33	35	8	15	14	30	44	20	0	0	1.4	1	0.8	0.5
38	B0221	39	40	4	15	30	15	27	30	0	0	1	3	1	2
39	B0222	31	40	12	15	23	10	34	35	0	0	0.8	2	1.3	1.3
40	B0223	23	35	5	20	27	10	42	35	3	0	0.6	2	0.9	2

Student Behavior Data Summary

	Motor Appropriate		Cognitive		Managed(st)		Waiting		Other	
Code #	Act	Pred	Act	Pred	Act	Pred	Act	Pred	Act	Pred
A0011	6	25	31	30	40	25	23	20	0	0
A0012	10	30	14	30	45	30	21	10	11	0
A0013	6	25	21	25	46	30	26	20	1	0
A0021	27	25	43	30	15	15	14	15	2	15
A0022	9	50	47	20	21	15	22	15	1	0
A0023	39	75	36	15	21	10	3	0	12	0
A0031	13	33	31	33	35	20	27	14	4	0
A0032	22	40	15	30	30	10	30	20	3	0
A0033	25	30	7	30	39	20	23	20	6	0
A0041	15	20	7	10	62	20	16	50	1	0
A0042	18	80	13	0	49	10	3	10	17	0
A0051	10	45	24	20	37	20	29	15	0	0
A0052	12	60	1	10	68	15	13	5	7	10
A0061	27	80	21	5	44	10	5	5	2	0
A0062	29	85	3	5	62	5	2	0	5	5
A0071	77	80	12	12	4	8	3	0	4	0
A0072	73	76	13	16	1	8	0	0	9	0
A0073	8	85	0	2	67	3	22	10	3	0
B0021	6	30	23	10	27	10	34	5	8	45
B0022	12	20	8	10	36	10	34	10	10	30
B0023	19	25	58	4	17	15	1	5	5	10
B0041	50	35	6	15	13	15	9	0	21	35
B0042	21	30	43	15	11	10	9	0	16	45
B0071	24	20	21	20	20	10	28	20	7	30
B0072	18	25	38	20	12	20	32	15	0	20
B0073	28	25	33	15	17	10	15	2	6	48
B0081	41	60	32	15	10	15	7	0	10	10
B0082	69	90	23	5	1	0	5	0	2	5
B0083	64	85	20	5	6	5	0	0	9	5
B0174	29	25	33	25	21	15	5	10	9	25
B0211	41	50	20	10	18	10	12	10	9	20
B0212	31	25	44	30	14	15	9	5	1	25
B0213	39	50	23	15	7	10	5	5	20	20
B0221	24	35	24	15	30	10	7	0	14	20
B0222	22	45	21	15	19	10	19	10	19	20
B0223	18	30	20	15	32	15	24	15	6	25

Teacher Behavior Estimation Summary - Control

Code #	Monitored	Feedback	Managed	Instructed	Other	Reinforced(rate)	Corrected (rate)
A0011	6	20	-8	1	-8	2.4	1.6
A0012	0	10	-9	1	0	0.9	0.9
A0013	5	14	-19	1	0	1.2	1.8
A0021	31	11	-9	-33	0	0.2	0.1
A0022	31	9	-15	-13	-2	0.4	1.1
A0023	26	-3	-20	3	-6	0.3	-0.2
A0031	9	9	-30	13	-1	-1.2	-0.7
A0032	5	14	-20	3	-1	-0.5	-0.1
A0033	-14	27	-18	5	-1	-0.9	-0.7
A0041	5	17	-1	-21	0	0.4	4.1
A0042	-35	14	6	13	0	4.3	0.5
A0051	-20	10	-9	20	-1	-0.4	-0.6
A0052	-49	4	16	24	5	-0.1	-1.5
A0061	19	3	-20	-5	3	0.6	-0.1
A0062	15	-8	-11	4	0	0.5	-1.4
A0071	22	-2	-10	-10	0	-0.5	2.6
A0072	8	-2	-24	17	-1	0.1	1.9
A0073	21	4	-37	11	0	2.5	0.7
Largest err	-49	27	-37	-33	-8	4.3	4.1
mean under	-24.8	-38	-16.3	-16.4	-0.4	-3.6	-0.7
# of obs.	5	4	16	5	8	6	8
mean over	16.4	11.9	11	8.9	4	1.1	1.5
# of obs.	12	14	2	13	2	12	10
# correct	1	0	0	0	8	0	0

Student Behavior Estimation Summary - Control

Code #	Motor Appropriate	Cognitive	Managed(st)	Waiting	Other	
A0011	19	-1	-15	-3	0	
A0012	20	16	-15	-11	-11	
A0013	19	4	-16	-6	-1	
A0021	-2	-13	0	1	13	
A0022	41	-27	-6	-7	-1	
A0023	36	-9	-11	-3	-12	
A0031	20	12	-14	-13	-4	
A0032	18	15	-21	-10	-3	
A0033	5	23	-19	-3	-6	
A0041	5	3	-42	34	-1	
A0042	62	-13	-39	7	-17	
A0051	35	-4	-17	-14	0	
A0052	48	9	-53	-8	3	
A0061	53	-16	-34	0	-2	
A0062	56	2	-57	-2	0	
A0071	3	0	4	-2	-4	
A0072	3	3	7	0	-9	
A0073	78	2	-64	-12	-3	
Largest error	78	-27	-64	34	-17	
mean under	-2	-11.9	-28.1	-7.2	-5.7	
# of obs.	1	7	15	13	13	
mean over	30.5	8.9	5.5	14	8	
# of obs.	17	10	2	3	2	
# correct	0	1	1	2	3	

Teacher Behavior Estimation Summary - WMU

Code #	Monitored	Feedback	Managed	Instructed	Other	Reinforced(rate)	Corrected (rate)	
B0021	22	1	2	-21	0	1.8	-0.1	
B0022	-18	13	6	-19	-1	-0.1	0.9	
B0023	11	17	13	-29	-1	0.3	-0.3	
B0041	-4	13	-10	-1	-2	-1.7	-0.5	
B0042	0	19	-13	-6	0	-0.5	0.4	
B0071	2	15	-23	11	-3	0	0.3	
B0072	-20	8	16	-3	-1	0.3	2.2	
B0073	-8	16	-4	-2	0	0.5	-0.5	
B0081	-3	-13	-2	19	0	1.1	0.1	
B0082	-7	13	-10	18	-1	-0.8	0.2	
B0083	-14	7	-14	22	0	-1.4	-0.1	
B0174	-2	-7	2	9	0	-1.2	-0.3	
B0211	-22	-10	-3	-3	0	-1.1	0	
B0212	-7	4	8	-3	-1	-0.4	-0.7	
B0213	2	7	16	-24	0	-0.4	-0.3	
B0221	1	11	-15	3	0	2	1	
B0222	9	3	-13	1	0	1.2	0.2	
B0223	12	14	-17	-7	-3	1.4	1.1	
Largest err	-22	19	-23	-29	-3	2	2.2	
mean under	-10.5	-10	-11.3	-10.7	-1.6	-0.8	-0.3	
# of obs.	11	3	11	11	8	9	8	
mean over	8.4	10.7	9	11.9	0	1.1	0.7	
# of obs.	7	15	7	7	0	8	9	
# correct	1	0	0	0	10	1	1	

Student Behavior Estimation Summary - WMU

Code #	Motor Appropriate	Cognitive	Managed(st)	Waiting	Other	
B0021	14	-13	-17	-29	37	
B0022	8	2	-26	-24	20	
B0023	6	-13	-2	4	5	
B0041	-15	9	2	-9	14	
B0042	9	-28	-1	-9	29	
B0071	-4	-1	-9	-8	23	
B0072	7	-18	8	-17	20	
B0073	-3	-18	-7	-13	42	
B0081	19	-17	5	-7	0	
B0082	21	-18	-1	-5	3	
B0083	21	-15	-1	0	-4	
B0174	-4	-8	-6	5	16	
B0211	9	-10	-8	-2	11	
B0212	-6	-14	1	-4	24	
B0213	11	-8	3	0	0	
B0221	11	-9	-20	-7	6	
B0222	23	-6	-9	-9	1	
B0223	12	-5	-17	-9	19	
Largest error	23	-28	-26	-29	42	
mean under	-6.4	-12.6	-9.5	-10.9	-4	
# of obs.	5	16	13	14	1	
mean over	12.4	5.5	3.8	4.5	18	
# of obs.	13	2	5	2	15	
# correct	0	0	0	2	2	

Appendix H

Graphs of Acceptability Ranges for All Behaviors

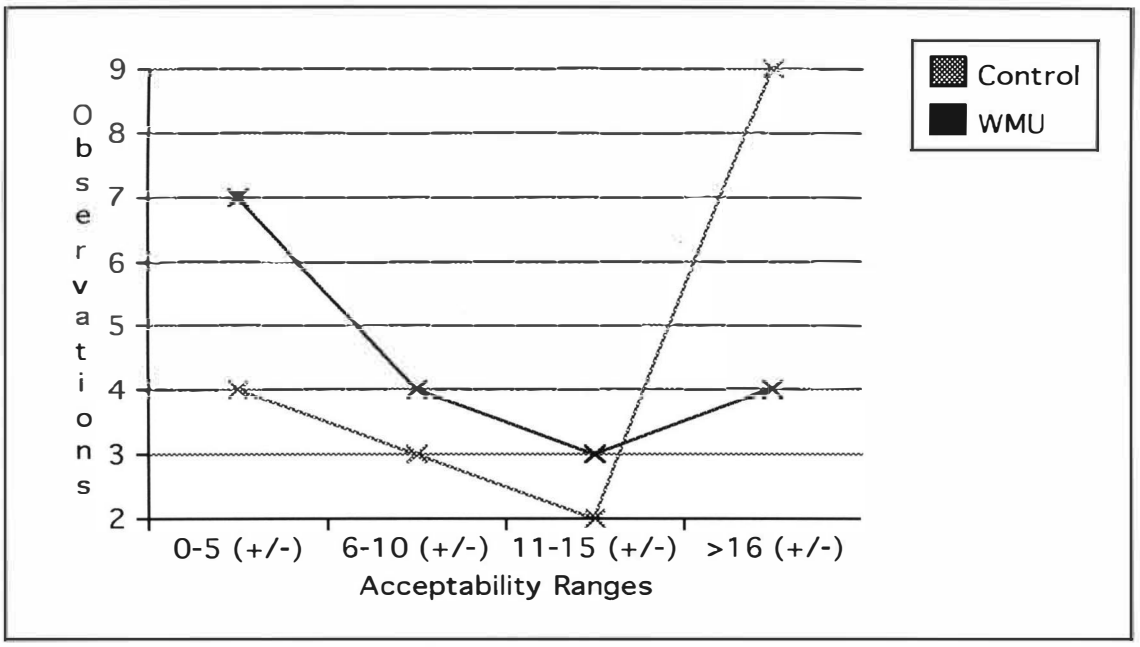

Figure 1. Trend/Level of Monitored Behavior

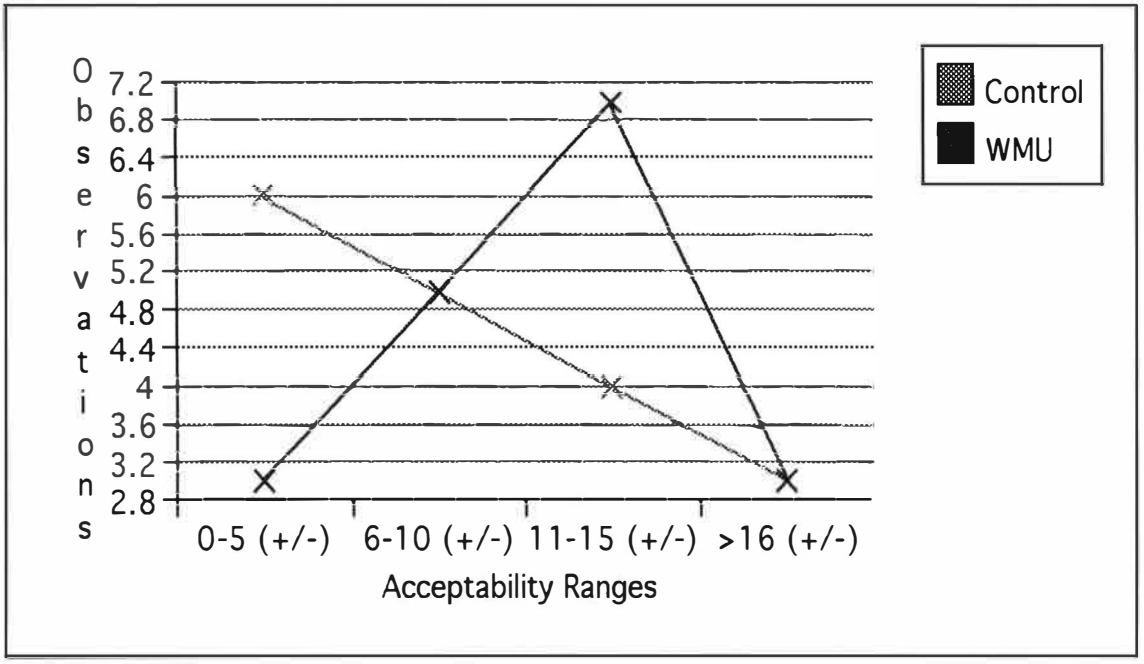

Figure 2. Trend/Level of Feedback Behavior

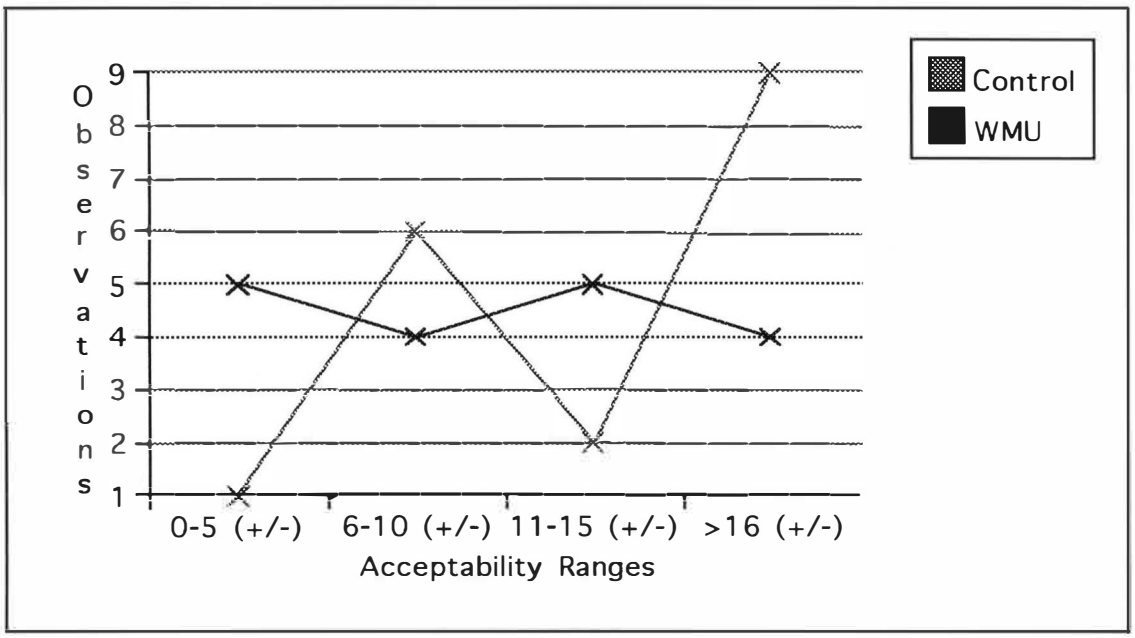

Figure 3. Trend/Level of Teacher Management Behavior

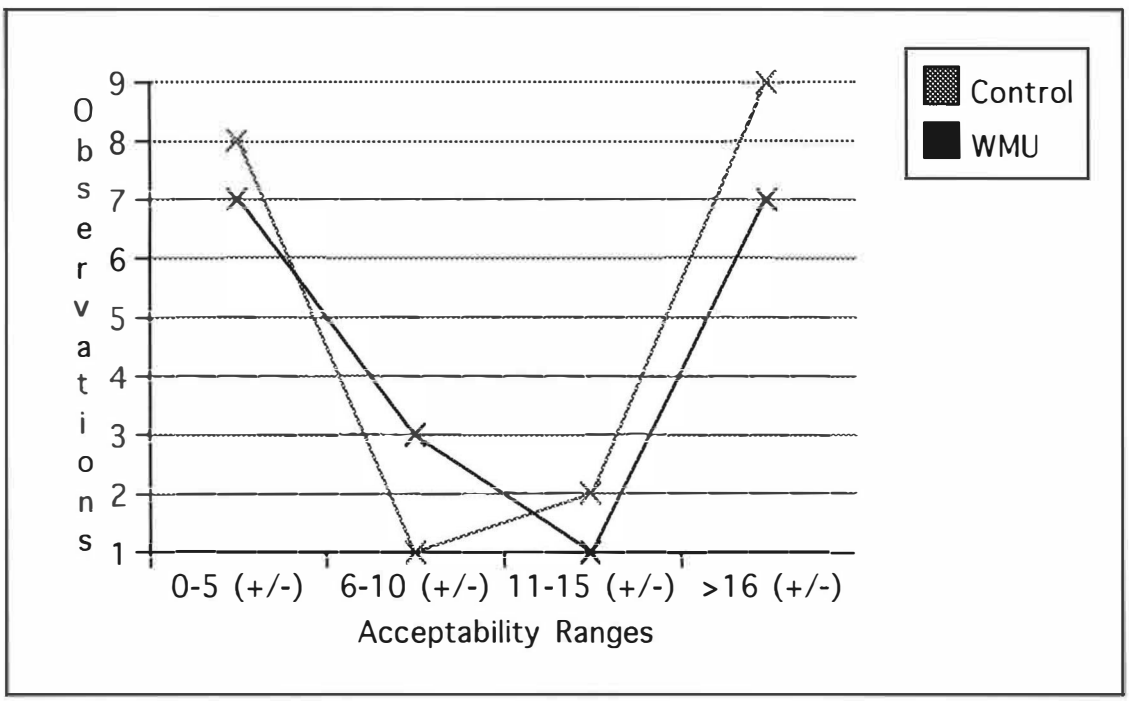

Figure 4. Trend/Level of Instructed Behavior

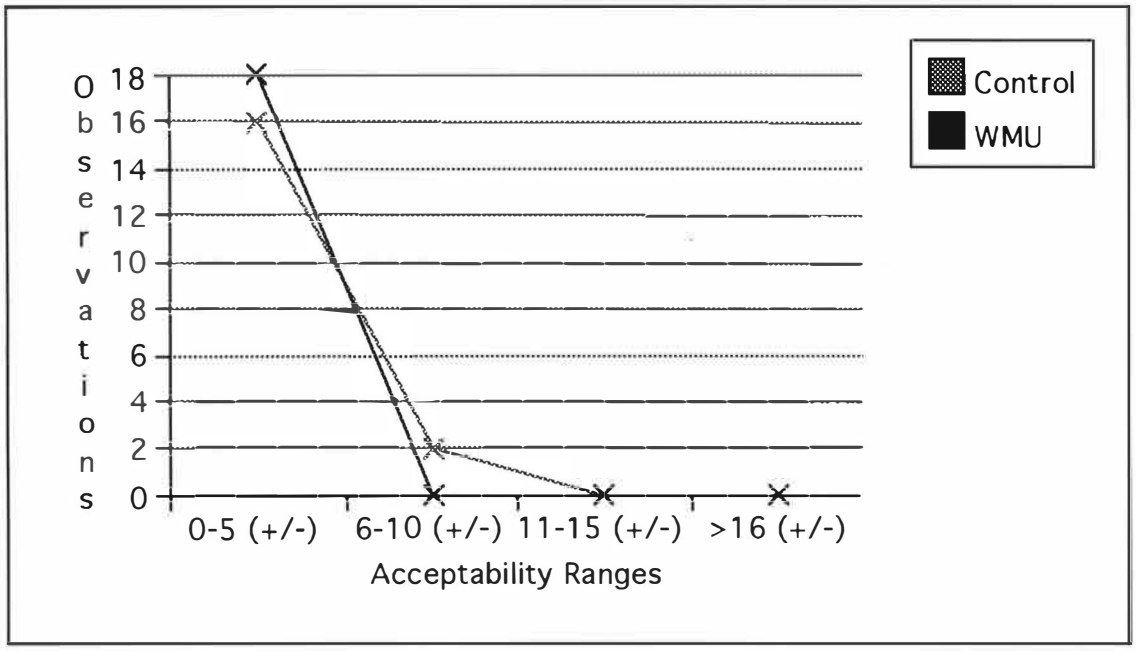

Figure 5. Trend/Level of Other Teacher Behaviors

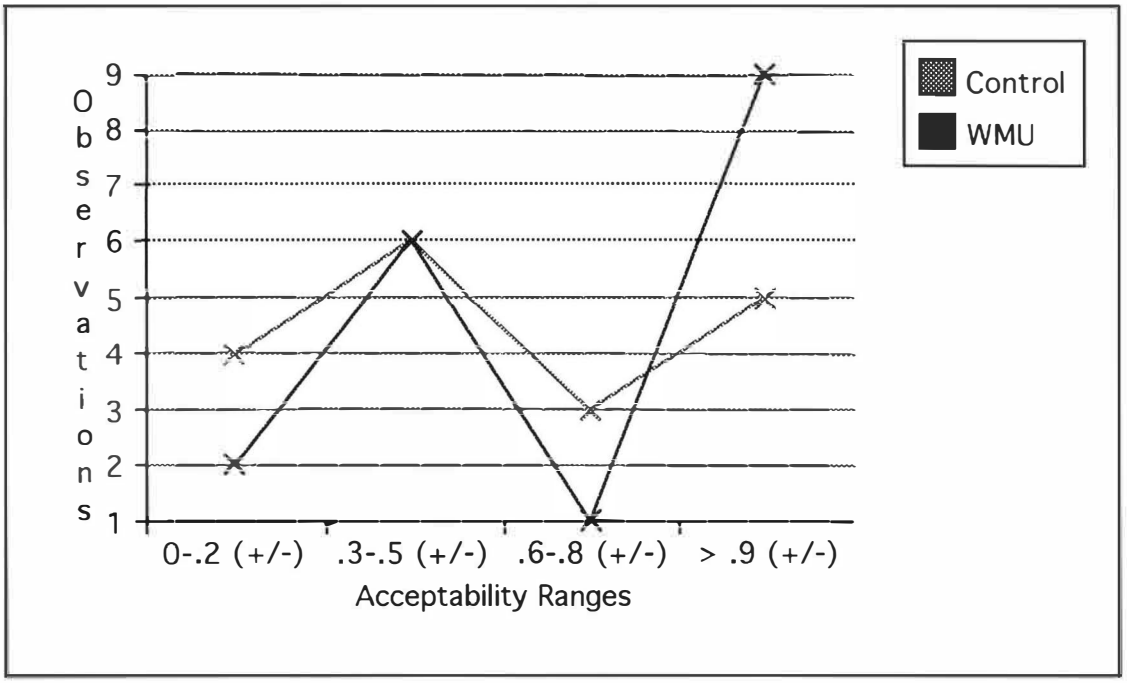

Figure 6. Trend/Level of Reinforcement Rate

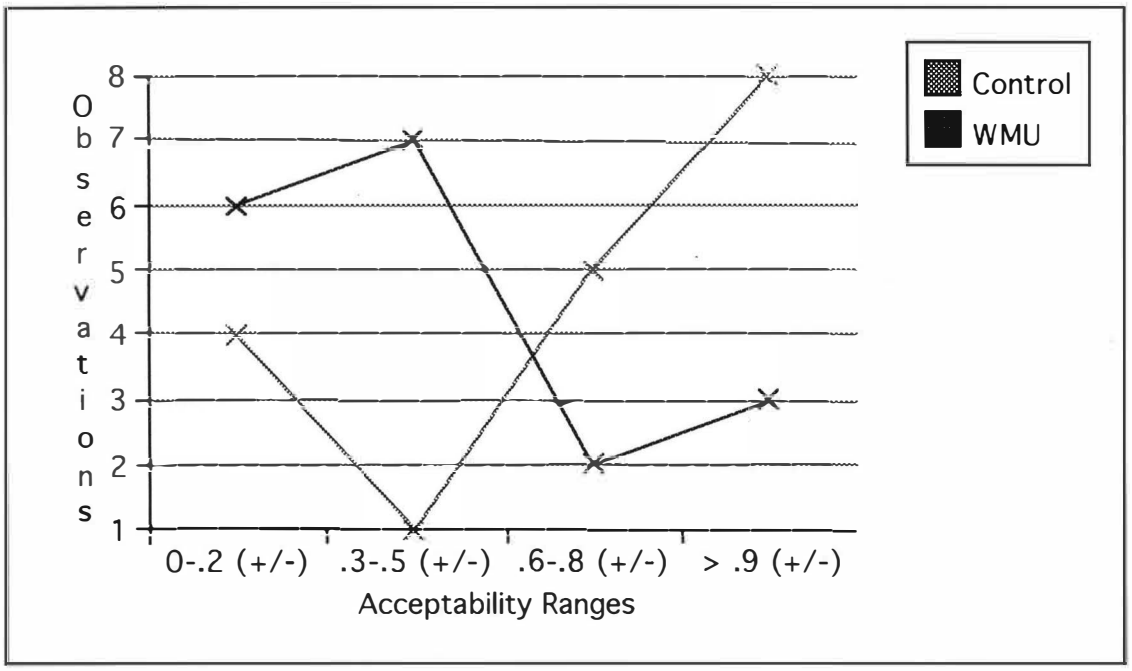

Figure 7. Trend/Level of Corrective Feedback Rate

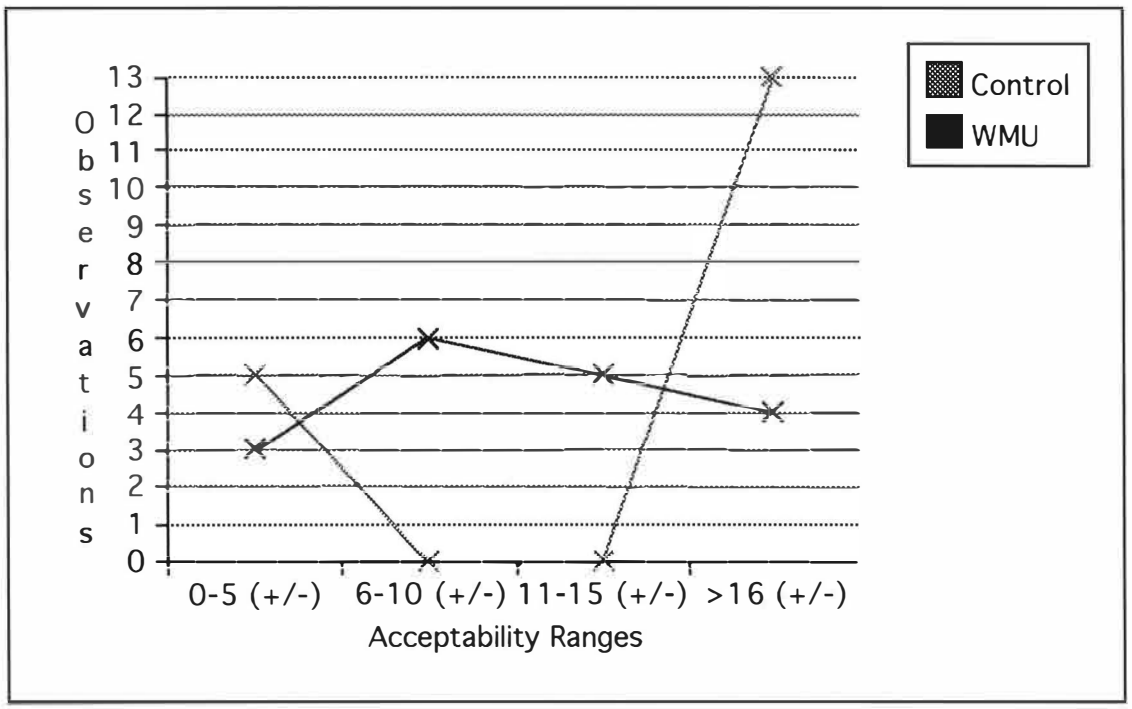

Figure 8. Trend/Level of Motor Appropriate Behavior

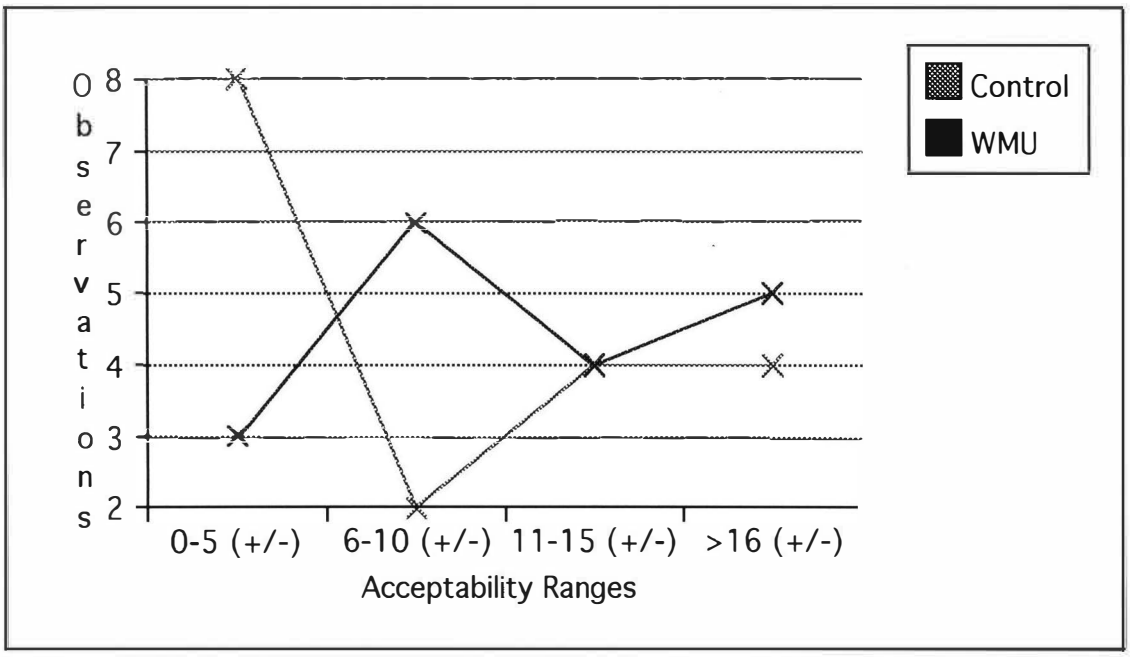

Figure 9. Trend/Level of Cognitive Behavior

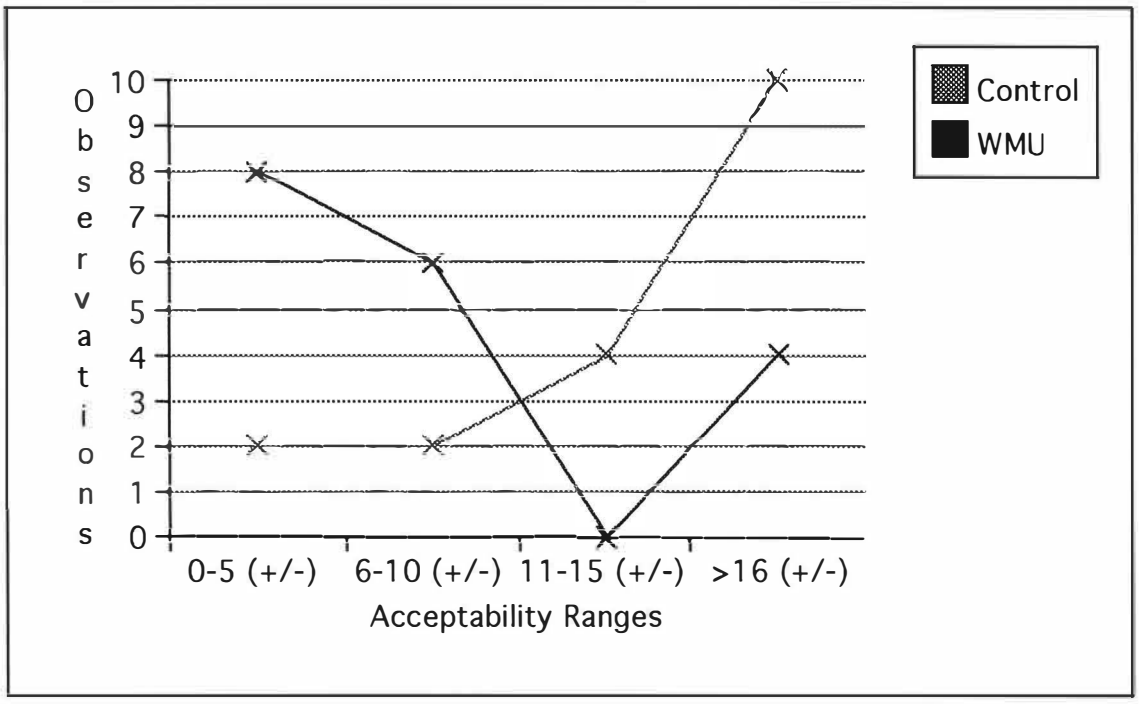

Figure 10. Trend/Level of Student Management Behavior

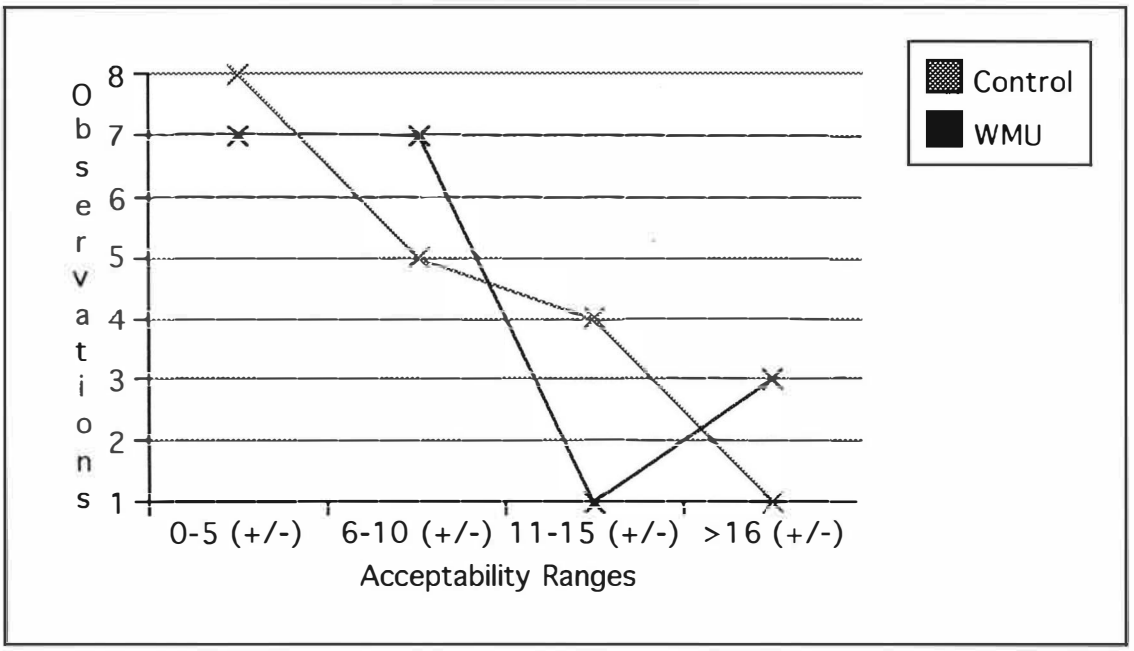

Figure 11. Trend/Level of Waiting Behavior

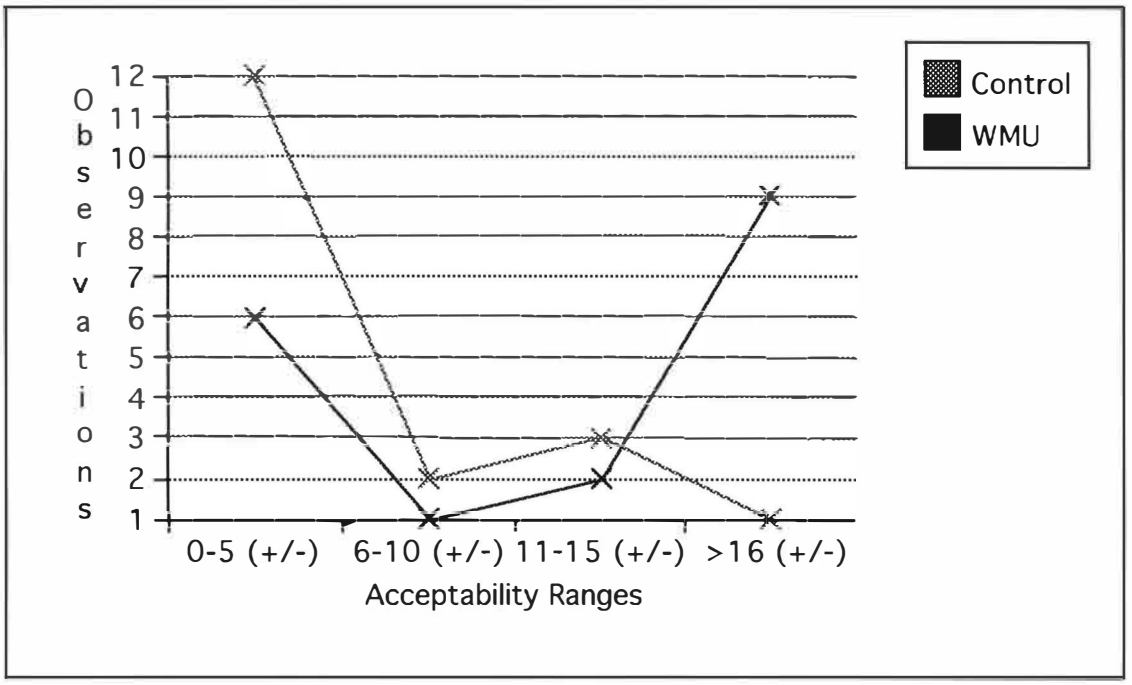

Figure 12. Trend/Level of Other Student Behaviors

BIBLIOGRAPHY

Ballinger, D.A. (1993, Late Winter). Becoming an effective physical educator. The Physical Educator, 50(1), 13-19.

Berkey, D.S., & Cool, R.T. (1990, November 10). Self-Assessment of Teaching Performance Among Student Teachers: A look at the Professional Teacher Preparation Program at Western Michigan University. Paper presented at the annual convention of the Michigan Alliance of Health, Physical Education, Recreation and Dance, Traverse City, MI.

Berkey, D.S., & Cool, R.T. (1991, January 18). Utilizing Electronic Technology to Enhance Teaching Performance. Paper presented at the annual conference of the Michigan Educational Research Association, Novi MI.

Berkey, D.S., & Cool, R.T. (1993, February 12). The Effects of State-Trait Anxiety Levels and Self-Assessment Accuracy Among Student Teachers. Poster session presented at the Midwest District American Alliance of Health, Physical Education, Recreation and Dance Convention, Toledo, OH.

Behets, D. (1993, Spring). Systematic observation training for preservice physical education teachers. The Physical Educator, 50(2), 87-94.

Bressan, E.S., & Weiss, M.R. (1982). A theory of instruction for developing competence, self-confidence and persistence in physical education. Journal of Teaching in Physical Education 2(1), 38-47.

Clawson, J. G., Kotter, J. P., Faux, V., & McArthur, C. C. (1992). Self-Assessment and Career Development (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Devoe, D.E. (1990, Spring). The effects of self-assessment on selected teaching behaviors of an elementary student teacher. The Physical Educator, 47(2), 37-41.

Douglas, J. W., & Weigand, R. L. (1987, January). Preparing physical education teacher educators. Journal of Physical Education, Recreation and Dance, 58(1), 67-69.

Fiorentino, L. H., Kowalski, E. M. & Barrette, G. T. (1993, May-June). Support PE: Moving towards collaborative teacher preparation. Journal of Physical Education, Recreation and Dance, 64(5), 76-83.

Grineski, S. & Bynum, R. (1990, February). Maximizing teacher preparation in physical education: A cooperative model. Journal of Physical Education, Recreation and Dance, 61(2), 92-94.

Hawkins, A. H., & Wiegand, R. L. (1989). West Virginia University teaching evaluation system and feedback taxonomy. In P. W. Darst, D. B. Zakrajsek & V. H. Mancini (Eds.) Analyzing Physical Education and Sport Instruction (2nd ed.) (pp.277-293). Champaign Il: Human Kinetics.

MacMillen, D. (1988, May-June). Preparing physical educators. Journal of Physical Education, Recreation and Dance, 59(5), 68-72.

Medley, D. M., Coker H., & Soar, R. S. (1984). Measurement-Based Evaluation of Teacher Performance: An Emperical Approach. New York: Langman.

O'Sullivan, M. (1990, February). Physical education teacher education in the United States. Journal of Physical Education, Recreation and Dance, 61(2), 41-45.

Parker, M. (1989). Academic Learning Time - Physical Education (ALT-PE), 1982 revision. In P. W. Darst, D. B. Zakrajsek & V. H. Mancini (Eds.) Analyzing Physical Education and Sport Instruction (2nd ed.) (pp.195-205). Champaign Il: Human Kinetics.

Puoach, M. C. (1990, April). Self-Study: The Genesis of Reflection in Novice Teachers. Paper presented at the annual meeting of the American Educational Research Association, Boston MA.

Randall, L. E. (1992). Systematic Supervision for Physical Education. Champaign Il: Human Kinetics.

Richards, S. C. (1976). Assessment and behavior modification via self-monitoring: An overview and bibliography. Psychological Documents, 15, 32 (Ms. No. 1428).

Rink, J. E. (1993). Teaching Physical Education for Learning. (2nd ed.). Missouri: Mosby.

Sharpe, T. (1992, May-June). Teacher preparation--A professional development school approach. Journal of Physical Education, Recreation and Dance, 63(5), 82-87.

Strand, B. N. (1992, Spring). A descriptive profile of teacher preparation practices in physical education teacher education. Physical Educator, 49(2), 104-111.

Struyk, L. R. (1990). Development and Validation of Teacher's Self-Evaluation Procedures for Assessing Classroom Management Strategies During Transitions. Paper presented at the annual meeting of the American Educational Research Association, Boston MA.

Taylor, J. L. (1986, January). Surviving the challenge. Journal of Physical Education, Recreation and Dance, 57(1), 69-72.

Tsangaridou, N. & O'Sullivan, M. (1994). Using pedagogical reflective strategies to enhance reflection among preservice physical education teachers. Journal of Teaching in Physical Education, 14, 13-33.

van der Mars, H. (1989). Systematic observation: An introduction. In P. W. Darst, D. B. Zakrajsek, & V. H. Mancini (Eds.) Analyzing Physical Education and Sport Instruction (2nd ed.) (pp 3-17). Champaign Il: Human Kinetics.