

THE RELATIONSHIP BETWEEN SPECIALIST TEACHER TRAINING AND
EFFECTIVE PHYSICAL EDUCATION TEACHING IN THE
ELEMENTARY SCHOOL

by

BEVAN CHARLES GRANT
B.Ed., University of Victoria, 1977

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Faculty

of

Education

ACCEPTED
FACULTY OF GRADUATE STUDIES

DATE

Sept 1980

We accept this thesis as conforming
to the required standard

Dr. F. L. Martens

Dr. I. Burbank

Dr. D. Docherty

Dr. L. Yore

© BEVAN CHARLES GRANT, 1979

UNIVERSITY OF VICTORIA

November 1979

*All rights reserved. This thesis may not be reproduced in whole
or in part, by mimeograph or other means, without the
permission of the author.*

Supervisor: Dr. F. L. Martens

ABSTRACT

The purpose of this study was: (1) to determine whether there were any significant differences in teaching effectiveness and generic behaviour patterns between specialist and non-specialist physical education student teachers when teaching a physical education lesson, and, (2) to reveal if there were any behavioural differences between the most effective and least effective student physical education teachers. Eight matched pairs, a specialist with a non-specialist physical education student teacher, each taught one physical education lesson with the same theme to an intermediate class in one elementary school. The 16 lessons were videotaped. Three knowledgeable and experienced physical educators were asked to judge and rank the lessons for teaching effectiveness using a global rating. Gasson's Three Dimensional System of Interaction Analysis was used to analyze the behavioural pattern of each subject in the study. Twenty-one behavioural categories were considered in three separate dimensions; Teacher Verbal and Non-Verbal Dimension, Teacher Location Dimension, and the Child Activity Dimension. The results showed that no significant differences were found between the specialists and non-specialist student teachers in either their teaching effectiveness or generic behavioural patterns. However there was a noticeable variability within each group for all the behavioural categories that were considered in this study. When comparing the most effective and least effective student teachers in the study, it was found that the most effective

teachers provided approximately three times more on task activity for each class member than the least effective teachers in the study. The most effective teachers also exhibited a more versatile behavioural pattern which included less negative feedback than the least effective teachers.

[REDACTED]
Dr. F. L. Martens

[REDACTED]
Dr. I. Burbank

[REDACTED]
Dr. D. Docherty

[REDACTED]
Dr. L. Yore
[REDACTED]

TABLE OF CONTENTS

	Page
ABSTRACT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	ix
ACKNOWLEDGEMENTS	x
Chapter	
1. INTRODUCTION	1
Context of the Problem	1
Statement of the Problem	2
Delimitations of the Study	3
Definition of Terms	3
Assumption	4
2. REVIEW OF RELATED LITERATURE	6
General Education and Effective Teaching	6
Problems with Effective Teaching Research	7
What has been Considered when Determining Effective Teaching	8
Effective Physical Education Teaching	10
Considering Verbal and Non-Verbal Behaviour	12
The Use of Observational Instruments	14
Time on Learning Task	15
Studies Related to the Teaching of Physical Education	16
Summary	19

Chapter

3. RESEARCH METHODS	21
Introduction	21
Subjects	21
Dependent Variables	22
Independent Variables	22
The Lesson	23
Videotaping the Lesson	23
★ Ranking the Lesson for Teaching Effectiveness	24
Behavioural Analysis of Each Lesson	25
Recording Procedures	26
Data Analysis	26
4. RESULTS	31
Introduction	31
A Comparison of the Teaching Effectiveness of Specialist and Non-Specialist Student Teachers	32
Behavioural Differences between Specialist and Non-Specialist Student Physical Education Teachers	33
Teacher Verbal and Non-Verbal Dimension	33
Teacher Location Dimension	36
Child Activity Dimension	36
Summary of Behavioural Differences between Specialists and Non-Specialists	38
Relationship between Behavioural Patterns and Effectiveness in Teaching a Physical Education Lesson	38
Teacher Verbal and Non-Verbal Dimension	39

Chapter

4. Continued	
Teacher Location Dimension	41
Child Activity Dimension	42
Summary of the Relationship between Behavioural Patterns and Teaching Effectiveness	44
5. SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FUTURE RESEARCH	46
Differences in Teaching Effectiveness between Specialist and Non-Specialist Student Teachers	46
Findings	46
Discussion	46
Behavioural Differences between Specialist and Non-Specialist Student Teachers	47
Findings	47
Discussion	48
Behavioural Differences between the Most Effective and the Least Effective Physical Education Student Teachers	49
Findings	49
Discussion	50
Suggestions for Future Research	51
BIBLIOGRAPHY	53
APPENDIXES	
A. GASSON'S THREE DIMENSIONAL SYSTEM OF INTERACTION ANALYSIS	58
B. DETAILS FOR THE PHYSICAL EDUCATION LESSON TO BE VIDEOTAPED	66
C. LETTER REQUESTING SCHOOL APPROVAL	69
D. SUMMARY OF THE RAW DATA	71

LIST OF TABLES

Table	Page
1. Observer Reliability when Analyzing for the Teacher Location Dimension	28
2. Observer Reliability when Analyzing for the Verbal and Non-Verbal Teacher Behaviour Dimension	39
3. Observer Reliability when Analyzing for the Child Activity Dimension	30
4. Summary of Wilcoxin Matched Pairs Signed-Ranks Test for Determining the Teaching Effectiveness between Matched Specialist and Non-Specialist Student Teachers .	32
5. Paired Sample t Test Results of Specialist and Non-Specialist Teachers in the Teacher Verbal and Non-Verbal Dimension	35
6. Paired Sample t Test Results of Specialist and Non-Specialist Teachers for the Teacher Location Dimension	36
7. Paired Sample t Test Results of Specialist and Non-Specialist Teachers for the Child Activity Dimension	38
8. Separate Variance t Test Results of the Most Effective and the Least Effective Teachers in the Teacher Verbal and Non-Verbal Dimension	40
9. Separate Variance t Test Results of the Most Effective and the Least Effective Teachers in the Teacher Location Dimension	42
10. Separate Variance t Test Results of the Most Effective and the Least Effective Teachers in the Child Activity Dimension	43
11. Frequency of Occurrence and Percentage of Lesson Time for each of the 21 Behavioural Categories for Sample Recording Sheet	65
12. Frequency of Occurrence for the Verbal and Non-Verbal Teacher Behaviour Dimension Categories for Matched Pairs of Physical Education Sepcialist and Non-Specialist Student Teachers	72

Table	Page
13. Frequency of Occurrence for the Teacher Location Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers	73
14. Frequency of Occurrence for the Child Activity Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers	74
15. Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Verbal and Non-Verbal Behaviour Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers	75
16. Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Location Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers	76
17. Frequency of Occurrences in Percentage of Total Lesson Time for the Child Activity Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers	77
18. Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Verbal and Non-Verbal Behavioural Dimension Categories for the Most Effective and the Least Effective Student Teachers	78
19. Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Location Dimension Categories for the Most Effective and Least Effective Teachers	79
20. Frequency of Occurrences in Percentage of Total Lesson Time for the Child Activity Dimension Categories for the Most Effective and Least Effective Student Teachers	80

LIST OF FIGURES

Figure	Page
1. The First Ten Minutes of a Sample Recording Sheet	64

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to my advisor, Dr. Fred Martens, for his considerate and helpful guidance during my graduate programme.

My thanks also go to Dr. D. Docherty and Dr. I. Burbank for their assistance as members of the Supervisory Committee. I offer a special thanks to Dr. L. Yore and Dr. J. McLeish for their willingness to spare me their valuable time and offer expert advice on numerous occasions.

To my three judges, Dr. J. Jackson, Mr. I. McLean, and Mr. S. Barber, I offer my sincere thanks for their willingness to give many hours of their personal time to view and rank the videotaped lessons, an arduous task.

To Ms. Norine Young, your proficient typing and patient proofreading has been greatly appreciated.

To the sixteen student teachers who were the subjects for the study, and the Principals and staff of the schools in which they were teaching, I offer my thanks for your co-operation.

Finally, to Bruce and Jan Howe, I am indebted for your sincere, and warm hospitality during my three years in Canada.

CHAPTER 1

INTRODUCTION

Context of the Problem

Although research relating to the teaching process in the school curriculum areas has been conducted for many years, there is no consensus on ways of achieving a high degree of teaching effectiveness. However, there is evidence which suggests that certain behaviours and methodologies are more effective than others. In physical education, only a small percentage of research has been directed at the teaching process.

What little research there has been on the effectiveness of teaching physical education suggests that:

1. There is no commonality in the results of the studies and there are no consistent conclusions (Locke, 1977; Cheffers, 1977; and Cooper, 1972).
2. The best combination of techniques that contributes to the effective teaching of skills has not been determined.
3. Teacher education curricula lack empirical evidence to suggest that student achievement in university courses is related to the ability to teach (Medley, 1973).

The lack of empirical evidence on what constitutes effective teaching strongly suggests that more studies need to be done. In

addition to this is the continuing question as to whether specialists or non-specialists should teach physical education at the elementary school level. It is clearly apparent that answers need to be found as to relative effectiveness of these two categories of teachers.

This study was designed to attempt to identify some of the types of teaching behaviours that are more effective than others, and to determine the relative effectiveness of specialist and non-specialist physical education teachers.

Statement of the Problem

The purpose of this investigation was to examine the relationship of the teaching effectiveness between student teachers who have specialist training in physical education and those who have not had such training as demonstrated in the teaching of a physical education lesson in the elementary school.

Sub-problems. In the course of conducting this examination, the following issues were considered:

1. Are physical education specialist student teachers more effective than non-specialist student teachers in teaching a physical education lesson?
2. Are there generic behavioural differences between physical education specialist student teachers and non-specialist student teachers during the teaching of a physical education lesson?
3. Is there a relationship between behavioural patterns and effectiveness in teaching a physical education lesson?

Delimitations of the Study

1. This study was confined to students who were registered in Professional Year studies at the University of Victoria, in two general groups: physical education specialists and, secondly, non-specialists who took a single course in physical education.
2. Each subject was required to teach a lesson with a similar theme in a gymnasium setting.
3. Subjects were required to teach within the Grade Three to Grade Six class range in a public elementary school.
4. The subjects were observed while teaching a single physical education lesson.
5. The behaviour categories considered were limited to those defined by Gasson's Observation Instrument (Appendix A).
6. The use of time intervals of three seconds while analyzing the behavioural categories did not guarantee that all operants were recorded.

Definition of Terms

Professional Year. In the elementary teacher preparation programme, normally the third year of the Bachelor of Education programme at the University of Victoria, British Columbia, during which the students study methodology and are required to do teaching practice.

Physical Education Specialist Student Teachers. Students that elected to specialize in the elementary physical education programme and had completed at least the minimum number of required physical education courses prior to their Professional Year.

Non-Specialist Physical Education Student Teachers. Students who were registered in their Professional Year in the Bachelor of Education programme, and had opted not to take the specialist physical education programme, having taken only the minimal physical education requirement, i.e. Ed-C. 747, Curriculum and Instruction in Elementary Physical Education, 1978/79.

Behaviour(s). A person's actions. If a specific behaviour category in the observation instrument is referred to, the meaning implied will be that listed in the detailed description in Appendix A.

Judges. Three knowledgeable and experienced people in the area of teaching elementary school physical education.

Rank. A number (ranging from one to 16) given by the judges determining the effectiveness of each lesson in relation to the other lessons being used in this study.

Most effective teachers. Those teachers ranked one, two, three, and four on the 16 point scale.

Least effective teachers. Those teachers ranked 13, 14, 15, and 16 on the 16 point scale.

Observer. One person whose task it was to analyze the 16 videotaped lessons using Gasson's Three Dimensional Interaction Analysis System.

Assumption

Because of the complex nature of the teaching act, the term

effective teaching was not defined. It was assumed that the three chosen judges were able to identify effective physical education teaching.

CHAPTER 2

REVIEW OF RELATED LITERATURE

After many years of research on teaching, there are still numerous conflicting reports about what constitutes good teaching. The differing opinions and research findings demonstrate that the nature of the teaching-learning process is a very complex one. In an attempt to provide some background to the previously stated question, a survey of the literature is presented here for both general teaching effectiveness and, specifically, physical education teaching effectiveness.

General Education and
Effective Teaching

Popham (1971), after reviewing many years of teacher effectiveness research, reported that no one method or type of teaching had been invariably associated with learning achievement. Saedeh (1970) also reported that many of the findings in the studies on teaching had been insignificant, indicating that a large number of the elements form the structure of the teaching-learning process. Boocock (1966) stated:

The classroom, the core of the school learning system, presents the most confusing picture. While it is clear that the teacher and the method he or she uses are important in the learning process, we can not yet say just what it is the effective teacher is or does. From what is known, there is no one type of teacher, teaching or classroom organization which produces the best results with all students.

McDonald (1976) supported this opinion and suggested that organizing

instruction is a critical domain of teaching performance. This differs by grade level and subject matter. Brophy and Everston (1976) reported from a review of several studies that effective teachers were problem preventers. This was achieved by monitoring the students carefully, by pre-planning, by keeping the students busy, and having smooth transactions between lesson segments.

Ryan (1964) claimed that many specific teacher acts can be observed in the classroom. The assumption was made that specific teacher behaviours are not completely independent of one another. After reviewing a series of detailed studies from the 1950-60 era involving 6,000 teachers in 1,700 schools, the findings did not provide satisfactory answers about the teaching-learning process. Manifestations of many teacher characteristics are only specific to a particular population.

Problems with Effective Teaching Research

Pedersen (1975) reported that the problems of teaching and effectiveness are so complex that no one knows how the competent teacher really behaves. So little is known because of the confusion about what to research and how to analyze the data. Biddle (1964) held similar views and suggested that the complexity and confusion are the reasons why so much has been written, yet so little is known about effective teaching.

Research on teaching in the natural setting is important. Flanders (1976) cited studies by Stevens in 1912, Olsen in 1929, Thomas in 1932, and Anderson in 1939. Each study attempted to analyze

teacher-learner interaction using a record of verbal communication. From these studies developed a dominative/integrative index which has provided a wide theoretical base for many of the more recently developed observational instruments. Unfortunately many of the instruments that have been used were designed for one specific study, making replication very difficult.

Rosenshine and Furst (1973), in recognizing the fact that a large number of classroom observational instruments exist, considered that there is too much variation in recording procedures, specificity of items, and format used to code events. In an attempt to get some uniformity of results, teaching observation studies should include:

1. a procedure for describing teaching in a qualitative manner;
2. correlated studies in which descriptive variables are associated with outcomes;
3. experimental studies where variables are controlled.

If educational research about teaching and learning is to be of benefit to the education process, then there should be an overlapping link between the three suggested factors.

Berliner (1976) and Kennedy and Bush (1976) suggested that one of the main methodological problems in studying effective teaching is determining how much influence the teacher has on the quality and quantity of student learning.

What has been Considered when Determining Effective Teaching?

No one method has been agreed upon as a means of determining

what effective teaching is. Musella (1970) suggested that teaching effectiveness could only be measured in terms of student learning outcomes. Brophy (1970) reported on a four year study involving 88 Grade Two and 77 Grade Three teachers. The results showed that teacher stability was important when using student learning gains as an effective teaching measure. McKeachie and Yi-Guang Lin (1971), after summarizing the results of five studies involving 53 teachers, reported that feedback, providing it has meaning, and student ratings were related to effective teaching. Student outcomes were used as the measure.

Ryans (1960), Musella (1970), and Coker (1976) all accepted that measuring learning outcomes was important, but agreed that there appeared to be a need to consider the behaviours of the teacher and the student if there was to be a more meaningful understanding of the teacher-learner relationship. Borg (1975) did not consider that all the importance of teaching effectiveness was related to achievement. Classroom management was an important factor. Meux and Smith (1964) suggested that by studying teaching behaviour patterns, patterns which induce learning could possibly be identified. Skinner (1974) believed teacher behaviour to be an important characteristic to consider when studying student learning. The teacher does presumably influence each student during his/her growing years, but behavioural studies become very complex because of the large number of variables. One task in evaluating teaching behaviour is to determine response categories into which the behaviour can be classified. Teacher behaviour was considered both in terms of the spoken word as well as any movement

capable of influencing another organism. Keith, Tornatsky and Pettigrew (1974) shared similar views and indicated that verbal expression of approval was not closely related to pupil responsiveness.

Flanders (1970) believed that both teacher and student behaviours could be studied by the use of an interaction analysis instrument using selected elements of classroom communication. The results of six out of the seven studies conducted on teacher influence between 1955 and 1967, showed that there was a relationship between student involvement, and positive attitude towards the teacher and the learning activity. Replication of similar type studies was recommended. Ager (1970), Bandi (1970), and Reynolds (1970) all reported on studies which showed that a more indirect teacher influence in the classroom would induce more learning.

After a study of effective teaching using fifty-four 15 minute lessons, which were rated by expert judges and analyzed using a ten category behavioural system, McLeish (1978) stated that:

Effective teaching is a function of the discriminate use of a variety of operants. This is a dynamic process, not a mechanical procedure. Learning involves a multiple input of stimulus and reinforcement patterns, with responses by the subject. These are caught up in the interactive pattern generated by the response of the teacher and other participants.

As teaching is comprised of many different interacting variables, to consider one without the other may provide misleading information. Brophy and Everston (1976) suggested that a combination of teaching skills rather than a single performance accounts for effective teaching.

Effective Physical Education Teaching

The quality of research on teaching effectiveness varies for

each school curriculum area. Physical education offers a different type of teaching-learning environment to that of the regular school classroom. However, it can be assumed that many of the classroom principles for teaching would apply to the gymnasium learning environment. Locke and Nixon (1973) suggested that when questioning what the teacher does while having the children learn movement skills, all aspects of the teacher's behaviour need to be analyzed if a meaningful answer is to be obtained.

Berliner (1975) considered that too much research had used pre and post test scores to determine teaching effectiveness. When this type of data is used to reflect the effectiveness of the teaching process, only inferences can be made about the teaching effect. Soar (1978) hypothesized that an unknown percentage of pupil achievement is not accounted for by inherited characteristics. This being the case, the problem of measuring pupil gain in many educational fields as a direct result of teaching is a major one.

Rosenshine and Furst (1973), and Fishman and Anderson (1971), reported that research seldom takes descriptive data from the learning environment, even though significant findings are possible when using this method. To study teaching effectiveness, Goldberger (1974) considered that there was a need to study what the teachers do. Regardless of the teachers' intent, it is their actual behaviour which the learners perceive and to which they must react.

Siedentop and Hughley (1975) noted that a behavioural scale would be useful for observing and classifying descriptive data relating to the teacher's behaviour during the teaching of physical education.

Anderson (1971) considered that the main function of a descriptive analytic instrument was to collect accurate records of teaching acts which would provide meaningful information. Similar theoretical and procedural principles should prevail even though the classification of data may differ. Locke (1977) stated:

The study of teaching physical education through the use of systematic observation and descriptive analytic techniques is no more than a decade old.

After reviewing the California Beginning Teacher Evaluation Study, Berliner and Tikunoff (1976) concluded that descriptive information helps to understand further the complexity of the teaching instruction and may help to discriminate between the more effective and less effective teachers.

Considering Verbal and Non-Verbal Behaviour

The qualitative aspects of verbal communication have been considered to measure the pattern of teacher influence. Nygland (1975) reported on a behavioural study which applied the Flanders' Interaction Analysis to 40 physical education teachers at different grade levels. The results showed that male teachers lectured more, while the female teachers praised, directed, criticized or justified authority, and initiated student talk more often. A summary of the results indicated that all teachers had a direct verbal influence on the class. Only inferences were made about teaching effectiveness from this study.

Contrary to this analysis, Flanders (1965) reported that for classroom teaching, direct teacher influence restricts learning and produces less desirable student attitudes. However, there was no

evidence to suggest that this would be the same when teaching physical education. Singer and Pease (1976) expressed the view that because of the complexity of many of the physical education activities, the teacher of physical education tends to be more dominant during instruction than the teacher in other subjects.

Keith et al. (1974) explained that research is leading communication analysts to agree that a continual flow of verbal as well as non-verbal cues are emitted in interpersonal situations. Both types of behaviour should be considered when examining the teacher in the learning environment. Classroom teaching is largely defined and mediated by the form and quality of interpersonal relationships. Cheffers (1973) considered that using non-verbal information only to analyze behaviour was not as accurate as when using both verbal and non-verbal behaviour.

Rankin (1976) used the Rankin Interaction Analysis and Cattell's Personality Factor Test to compare the behaviour and personality characteristics of 42 elementary student teachers. The only conclusion he could arrive at was that submissive student teachers rejected their students more frequently than dominant student teachers. This study reflected Bahneman's (1972) findings when 42 experienced physical education teachers' personalities and behaviour patterns were compared. No significant conclusions were reached.

Gasson (1971), recognizing the need to consider both verbal and non-verbal behaviours developed an instrument to record objectively teacher-pupil behaviour in elementary school physical education classes. One strength of the system is that the amount of time spent on a given

task can be recorded by an observer. This is considered to be an index of efficient class management.

After reviewing these studies it is evident that a study based only on verbal and/or non-verbal behaviour cannot supply very much information about effective teaching by itself.

The Use of Observational Instruments

Locke (1977) completed a review of research that had used an observation instrument to obtain different types of data from physical education lessons. It was noted that a number of researchers (Kurth, 1969; Love, 1969; Dougherty, 1970; Gasson, 1971; Love and Roderick, 1971; Boschee, 1972; Kiemile, 1972; Mancuse, 1972; Cheffers, 1973; Ebbs, 1975; and Nygland, 1975) conducted studies on teaching in a gymnasium setting using either Flanders' Interaction Analysis or an adaptation of this instrument. There was no evidence to suggest that the correct type of data were being collected. As a result many people (Lupien, 1970; Alder, 1972; Graham, 1973; Mawson, 1973; Showers, 1974; Fishman, 1974; Laubach, 1974; Hope, 1974; Hurwitz, 1974; Anderson, 1974; Siedentop and Hughley, 1975; Rankin, 1975; and Taylor, 1976) designed and developed separate observation instruments for specific studies relating to the teaching of physical education. Many of the instruments sought a similar type of data but standardization and replication were lacking; thus many of the results lacked supporting evidence and meaning.

Dorst (1977) and Herbert and Attridge (1975) caution that the tools used for analytic purposes will examine only a part of the teacher-

learner process and they must be used with care and precision as there are many confounding factors which could influence both data collecting and the results.

Time on Learning Task

The question of what percentage of the class time should be spent by the students on learning or developing skills is somewhat controversial. Locke and Nixon (1973) cited studies by Verducci and Overstreet which concluded that large physical education classes meant less practice by individual students. Consequently, lower skill achievement than what would be expected in smaller classes could be anticipated. They indicated this would vary with the skill taught and the teaching methodology used.

Brophy and Everston (1974) considered that management was the critical problem. In the Texas Teacher Effectiveness Study it was shown that classes with poor management generally had less engaged time on task. This is considered to have a negative correlation with learning. Agreeing with this, McDonald (1976) considered any teaching act that decreased direct instructional time is almost invariably negatively related to pupil performance. Locke (1978) agreed, and added that the attitude of the teacher has an important influence on the learning behaviour (including practice time) and performance of each individual, and this attitude inevitably affects the learning rate.

Rosenshine (1978) claims that when direct instruction takes place, interaction is structured. The goal for much of the learning is to move the students through a set of sequential tasks. Therefore, researchers should consider the percentage of engaged time on tasks

when studying teacher effectiveness.

Studies Related to the Teaching of Physical Education

Although few studies in physical education relate directly to teaching effectiveness, the available findings give some indication as to the problems confronted with research in the area. Locke (1978) cited Yerg's (1977) study, which is considered to be the first teacher effectiveness study in physical education. Forty graduate students each taught three elementary level children the cartwheel for a 20 minute duration. Pre and post performance tests were administered. The teachers were tested on knowledge and performance of the skill and their behaviour was analyzed: presentation, practice time, and feedback. The results showed that the teaching did not contribute significantly to skill achievement, even though the children's post test performance scores were superior. It was observed that one-fifth of the time was spent on management tasks.

Bookhout (1967) reported on what appears to be the first completed study relating teacher's behaviour patterns to the climate of the gymnasium. Thirty-six female teachers were observed using the Observation Schedule and Record instrument which considers 15 variables. The gymnasium climate was determined by Reed's Pupil Inventory. The results showed that six patterns of teacher behaviour could be identified. Integrative interaction positively related to supportive climate while restraining direction positively related to defensive climate. Four patterns of behaviour: (1) active direction; (2) skill perfection; (3) participation; and (4) aloofness, did not relate to the gymnasium

climate. Teaching effectiveness was assumed to be correlated with a positive climate. It was noted that many of the behaviours of teachers in the gymnasium and those in the classroom were similar.

Hughley (1973), using the Ohio State University Teacher Behaviour Rating Scale with four beginning teachers, found that primarily negative behaviours were recorded during teaching practice. Rates of feedback were also very low. Negative behaviours were not considered to automatically decrease the learning rate.

Keitley (1975) suggested that the videotape would be an invaluable way of recording and providing feedback on teacher behaviour. Although not attempting to determine teacher effectiveness specifically, Anderson (1975) reported on a descriptive-analytic research study involving 83 separate elementary and secondary school physical education teachers. All data were collected on videotape. A summary of the available published results indicated: (1) 95% of feedback was verbal, 53% being positive and 42% being negative; (2) 77% of the feedback was directed at a single student, 17% to a group, and 6% to the whole class. The percentages varied between teacher, grade level, and activity. Student behaviour, identified as movement task was classified into three sections: (1) inactive, 53% of the time; (2) involved with movement related to the physical education objectives, 35% of the time; (3) other movement tasks, 12% of the time. The teachers spent 95% of the in-class time preparing for, guiding and observing students' performance. Students were directed toward activities 83% of the time.

Using the B.E.S.T.P.E.D. (Behaviour of Students in Physical

Education) System, Costello and Laubach (1978) reported on the behaviour of 193 students in 20 different classes of varying grade levels. An analysis of the collected data showed the following average percentage of time spent in each of the five main categories: (1) 60.8% waiting for or listening to the teacher; (2) 15.3% practicing motor skills; (3) 10.3% playing games; (4) 3.6% exercising; (5) 0.2% exploratory movement exercising.

Anderson and Barrette (1978) used Anderson's Descriptive System to study the behaviour of 20 elementary and 20 secondary school physical education teachers. A descriptive analysis showed the following results as a mean of the total group: (1) 23.4% preparing for motor activities; (2) 32.1% guiding the performance of motor activities; (3) 21.1% observing motor activities; (4) 17.8% other interactive behaviours; (5) 4.8% non-interactive intervals. When examining the results it becomes evident that physical education teachers spend a large percentage of their time either instructing or observing the class.

Cheffers and Mancini (1978) used the C.A.F.I.A.S. (Cheffers Adaption of Flanders' Interaction Analysis System) when studying student-teacher interaction in 83 physical education classes at both elementary and secondary levels. Results showed: (1) only minimal differences existed between male and female teachers, and between elementary and secondary teachers; (2) teachers used lecture, demonstration, and direction-giving as their overwhelming predominant mode of teaching; (3) by comparison with recorded teacher behaviours, acceptance of student feelings and ideas, praise or questioning

occurred very infrequently; (4) punishment and correction of student behaviours was minimal; (5) virtually no genuine student initiated activity was recorded; (6) the teacher-student contribution towards the lesson was established as a ratio of 3:2 with the student contribution being predominately non-verbal.

Cooper (1977) supported this type of descriptive data which begins to categorize the complex phenomenon of the teaching act, and considered that such information would help support or reject theories about effective teaching.

To date there is only a minimal amount of information available about what actually happens in the gymnasium during the teaching of physical education. Locke and Nixon (1973) recommend that future research include only studies which use data gathered through either direct or indirect observation of instructional activity. This would allow for more meaningful knowledge to be accumulated about the process of effectively teaching physical education.

Summary

After reviewing the literature, it becomes evident that very little is known about what constitutes effective teaching of physical education. Many studies, using a variety of methods, have attempted to define some of the necessary characteristics that effective teachers should have. It could be considered that studies in this area:

1. lack systematic instrumentation, replication, and methods of analyzing the data;
2. are unable to define what the most important variables are

to consider when studying teacher effectiveness;

3. lack a method for determining effective teaching for physical education.

CHAPTER 3

RESEARCH METHODS

Introduction

This chapter describes the variables, data collecting procedures, and the methods for analyzing the data. A correlational naturalistic research design was employed for the purpose of examining the relationship between the type of teacher preparation and the effectiveness of teaching physical education.

Prior to collecting the data by videotape, approval of the subjects (student teachers), of the subjects' teaching practice supervisor, and of the school administration (Appendix C) was obtained.

Subjects

Sixteen subjects were randomly selected from two previously defined groups of students involved in Elementary Professional Year studies at the University of Victoria, Victoria, British Columbia, 1978-79; i.e. Physical Education Specialist Student Teachers, and Non-Specialist Physical Education Student Teachers. Eight subjects were selected from each group. The subjects were matched (a specialist with a non-specialist) for sex, and teaching grade level. Each subject was involved in a teaching practice session from April 2 to May 11, 1979, in an assigned elementary school in British Columbia.

Dependent Variables

1. Effectiveness as a physical education teacher. Three judges viewed the videotapes and ranked each lesson for teaching effectiveness on a 16 point scale. The rating one (1) represented the most effective lesson and the rating 16 represented the least effective lesson.
2. Behavioural dimensions. The following 21 behavioural categories (listed in three groups), as defined by Gasson's Three-Dimensional System of Interaction Analysis were considered by the investigator when observing the videotape of each lesson:
 - (a) Teacher verbal and non-verbal behaviours: accepts feelings, praises and encourages, accepts or uses ideas of the student, asks questions, lectures, gives directions, criticizes or justifies authority, listens to pupil(s), inaudible communication, monitors, demonstrates, use of stimulus.
 - (b) Teacher location: can see all the students with a glance, positioned among the students, absent from the room.
 - (c) Student activity: majority participation, average participation, minimal participation, demonstration, organization, off-task activity.

(A detailed description of the categories is included in Appendix A.)

Independent Variables

1. Physical education specialist student teachers.
2. Non-specialist physical education student teachers.
3. Teaching effectiveness of the student teachers while teaching physical education (for the third sub-problem).

- (a) Most effective: student teachers ranked from 1 to 4 on the scale.
- (b) Least effective: student teachers ranked from 13 to 16 on the scale.

The Lesson

Each subject was required to teach one physical education lesson in a gymnasium environment to his/her previously assigned class (see Appendix B). To standardize the curriculum context of the lesson, each lesson had the same theme: to provide experiences which will enhance each child's balancing ability. (Balance is referred to as an element of movement related to body awareness for all grade levels. See page 55 of the Curriculum Guide for Elementary School Physical Education, Department of Education, Victoria, B.C., 1975.)

The teaching method, the choice of activities, and the use of specified equipment was not stipulated by the investigator so as to avoid this kind of influence on the teaching act.

Videotaping the Lesson

To allow for a more accurate observation each lesson was videotaped for viewing and analyzing. The camera was stationed at an appropriate place on the stage of the gymnasium so that the whole class could be viewed with minimal distraction. To obtain a clear recording of the teacher's voice, each subject was asked to wear a small cordless microphone. This did not restrict the physical aspect of the teaching act in any way.

The recording equipment used included:

1. A portable Sony half-inch Videotape Camera;
2. A half-inch Sony Videotape Recorder;
3. An Edcore cordless microphone, transmitter, and receiver.

All equipment was made available by the Media and Technical Services Department at the University of Victoria.

Ranking the Lesson for Teaching Effectiveness

Three judges chosen on the basis of their knowledge in the area of teaching elementary physical education were asked to view each of the 16 videotaped lessons. The judges were not aware as to which of the two groups each of the 16 subjects belonged, or what method of analysis was to be applied to the lessons. During the viewing, each judge recorded brief comments about the lesson under the following two headings:

1. effective teaching behaviours observed;
2. ineffective teaching behaviours observed.

At the completion of viewing each lesson the three judges individually ranked the lesson on a 16 point scale. Only one lesson could be assigned to each rank.

The rankings were based on a global rating. In a review of teacher behaviour studies, Shavelson and Dempsey-Atwood (1976) stated:

Of all the measures of teacher behaviour examined, global ratings appear to be the most stable. It is unclear whether this consistency represents an attribute of the teachers observed or observers' perception.

Global ratings do not require a set criterion for determining that aspect of teaching which is being observed.

Judges' agreement. To ensure that a high degree of inter-judge agreement existed, three "practice" videotapes were viewed by each judge prior to viewing the 16 lessons for ranking. During this time, each judge was asked to observe the lesson carefully, record comments, and rate each lesson on a 10 point scale. A comparison was made between what each of the judges perceived. After discussing the findings, the judges reached a consensus on what points to consider while viewing and ranking each of the 16 lessons. This provided for a consistent level of judge perception and consensus of opinion during the observation and ranking. No disagreement in ranking existed between the judges during their task.

Behaviour Analysis of Each Lesson

Before applying Gasson's Three Dimensional Interaction Analysis System to each of the 16 lessons, a training period was required for the observer. Using videotaped lessons repetitively for practice, the observer developed, and was able to maintain, a reliable consistency of time sequence recording (Appendix A).

Observer reliability. As only one observer was used, practice tapes were used to establish a high degree of reliability before analyzing the 16 videotapes. Observer reliability was determined by applying Scott's "pi" coefficient. Flanders (1965) suggested the use of Scott's method as it is unaffected by low frequencies, can be adapted to percent figures, and is more sensitive at higher levels of reliability.

Table 1 shows that a correlation coefficient of 0.94 was obtained between the observer's first and second viewing when analyzing a

videotaped lesson for the Teacher Location Dimension.

When analyzing the videotaped lesson for the Verbal and Non-Verbal Teacher Dimension, Table 2 shows that a correlation coefficient of 0.91 was obtained between the observer's first and second analysis of a videotaped lesson.

Table 3 shows that there was a correlation coefficient of 0.94 obtained between the observer's first and second analysis for the Child Activity Dimension.

Recording procedures. The 16 videotaped lessons were viewed and analyzed for each of the three predetermined behavioural characteristics which are specific to physical education: (1) Verbal and Non-Verbal Teacher Behaviour; (2) Teacher Location; (3) Child Activity. Each dimension was analyzed separately. The observer recorded the dominant category of the dimension being considered every three seconds. (This was changed from the recommended five second intervals to allow for a more detailed analysis of what behaviours occurred during the lesson.)

After viewing and analyzing the lesson for the three dimensions, the observer was able to determine the frequency of occurrence for each of the 21 behavioural categories. To standardize the collected data for analysis, it was necessary to change the number representing the frequency of occurrence for each category to a percentage score of the dimension to which it belonged.

Data Analysis

First, the Wilcoxin Matched Pairs Signed-Ranks Test was applied to determine if a significant difference existed between the teaching

effectiveness of physical education specialist student teachers and non-specialist physical education student teachers (Popham and Sirotnik, 1973:291). Secondly, a Paired Sample "t" Test was used to determine whether any significant behavioural differences existed between physical education specialist student teachers and non-specialist physical education student teachers during the teaching of physical education (Zar, 1974: 121-124). Thirdly, in determining whether a relationship existed between behavioural differences and teaching effectiveness, a Separate Variance "t" Test was applied since the most effective and least effective student teachers from the study were not matched pairs (Popham and Sirotnik, 1973:121-140).

Table 1

Observer Reliability when Analyzing for
the Teacher Location Dimension

Category	V ₁	V ₂	V ₁ %	V ₂ %	Difference %	Mean %	Mean% ²	Mean% ² / 100
P - On perimeter	449	439	68.23	67.12	1.11	67.67	4579.22	45.79
L - Amongst the Children	209	215	31.76	32.88	1.12	32.32	1044.58	10.44
X - Absent from the Room	--	--	--	--	--	--	--	--
	658	654			2.23			56.23

V₁ - first viewing by the observer, frequency of occurrence for each category.

V₂ - second viewing by the observer, frequency of occurrence for each category.

$$rr = \frac{(100 - P_o) - P_e}{100 - P_e} = \frac{(100 - 2.23) - 56.23}{100 - 56.23} = \frac{41.54}{43.77} = 0.94$$

Table 2

Observer Reliability when Analyzing for the Verbal and
Non-Verbal Teacher Behaviour Dimension

Category	V ₁	V ₂	V ₁ %	V ₂ %	Difference %	Mean %	Mean % ²	Mean % ² / 100
1. Accepts Feelings	4	5	0.6	0.76	0.16	0.68	.46	.004
2. Praises and Encourages	15	18	2.27	2.75	0.48	2.51	6.3	.063
3. Uses Student(s) Ideas	1	2	0.15	0.3	0.15	0.22	0.04	.0004
4. Asks Questions	7	9	1.06	1.37	0.29	1.21	1.47	.014
5. Lectures	165	151	25.07	23.08	1.99	26.07	579.36	5.79
6. Gives Directions	130	139	19.75	21.25	1.50	20.5	420.25	4.202
7. Criticizes	1	1	0.15	0.15	0.00	0.15	0.02	.0002
8. Pupil(s) Talk	10	12	1.51	1.83	0.32	1.67	2.78	.027
9. Teacher Inaudible	--	--	--	--	--	--	--	--
M. Monitors	287	280	43.61	42.81	0.80	43.21	1867.1	18.67
D Demonstrates	24	22	3.64	3.36	0.28	3.5	12.25	.122
S Use of Stimulus	14	13	2.12	1.98	0.14	2.05	4.2	.042
	658	654			6.11			28.9346

V₁ - first viewing by the observer, frequency of occurrence for each category.

V₂ - second viewing by the observer, frequency of occurrence for each category.

$$rr = \frac{(100 - P_o) - P_e}{100 - P_e} = \frac{(100 - 6.11) - 28.93}{100 - 28.93} = \frac{64.93}{71.07} = 0.91$$

Table 3

Observer Reliability when Analyzing for the
Child Activity Dimension

Category	V ₁	V ₂	V ₁ %	V ₂ %	Difference in %	Mean %	Mean % ²	Mean % ² / 100
A - Majority On Task	204	198	31.0	30.27	0.73	30.63	931.9	9.319
B - Average On Task	104	98	15.8	14.98	0.82	15.39	236.85	2.368
C - Minimum On Task	65	71	9.87	10.85	0.98	10.36	107.32	1.073
D - Demonstrating	6	8	0.91	1.22	0.31	1.06	1.12	.011
O - Organization	99	94	15.06	14.37	0.67	14.7	216.16	2.161
W - Waiting	180	185	27.35	28.28	0.93	27.81	773.53	7.735
	658	654			4.24			22.667

V₁ - first viewing by the observer, frequency of occurrence for each category.

V₂ - second viewing by the observer, frequency of occurrence for each category.

$$rr = \frac{(100 - P_o) - P_e}{100 - P_e} = \frac{(100 - 4.24) - 22.66}{100 - 22.66} = \frac{73.12}{77.34} = 0.94$$

CHAPTER 4

RESULTS

Introduction

The purpose of this study was to explore factors related to the effectiveness of teaching a physical education lesson. Specifically, three problems were investigated:

1. Are physical education specialist student teachers more effective than non-specialist student teachers at teaching a physical education lesson?
2. Are there generic behavioural differences between physical education specialist student teachers during the teaching of a physical education lesson?
3. Is there a relationship between behavioural patterns and effectiveness in teaching a physical education lesson?

As indicated in Chapter 3, data were collected on eight matched pairs of student teachers teaching a similar physical education lesson. Each lesson was videotaped and later the resulting tapes were coded and evaluated. The data, analyses and results are presented and discussed separately for each specific problem.

A Comparison of the Teaching Effectiveness
of Specialist and Non-Specialist Student Teachers

The videotaped lessons for the eight matched pairs of student teachers (a specialist with a non-specialist) were observed by three judges. The lessons were ranked on a 16 point scale for overall teaching effectiveness. One lesson was assigned to each rank (see Rating the Lesson for Teaching Effectiveness, p. 24).

A summary of the analysis using the Wilcoxin Matched-Pairs Signed-Ranks Test (Popham and Sirotnik, 1973:291) presented in Table 4 shows that no significant difference ($p > 0.05$) was found between the teaching effectiveness of the specialist and non-specialist student teachers when teaching a physical education lesson with the same theme.

Table 4

Summary of Wilcoxin Matched Pairs Signed-Ranks Test for
Determining the Teaching Effectiveness between Matched
Specialist and Non-Specialist Student Teachers

Matched Pair	Ranks		Difference in Rank	Rank of Difference with less frequent sign
	Specialist	Non-Specialist		
1	5	4	+1	
2	1	7	-6	5.5
3	16	10	+6	
4	2	12	-10	7
5	6	11	-5	4
6	14	13	+1	
7	15	3	+12	
8	9	8	+1	
				T=16.5

(for $p \leq 0.05$, $T = \leq 4$)

It is worth noting that the average rank for each group is almost identical; the specialists averaged a rank of 8.5 on the 16 point scale compared to the non-specialists' average rank of 8.6. However, upon further inspection of the rankings it becomes evident that the specialists were clustered at either end of the effectiveness scale (ranks 1, 2, 5, 6 and 9, 14, 15, 16). The non-specialists were ranked as a less variable group, clustered at the mid-range of the scale (ranks 3, 4, 7, 8, 10, 11, 12, 13), in terms of their teaching effectiveness.

Behavioural Differences between Specialist and
Non-Specialist Student Physical Education
Teachers

A single observer used Gasson's Three Dimensional Interaction Analysis System (Gasson, 1971) to code the 16 videotaped lessons for the three predefined behavioural dimensions (Teacher Verbal and Non-Verbal, Teacher Location, and Child Activity) considered to be specific to physical education. All data (Tables 12, 13, 14, 15, 16, 17 in Appendix D) were analyzed by the Paired Sample t-Test (Zar, 1974: 121). The analysis and results for the three dimensions are discussed separately.

Teacher Verbal and Non-Verbal
Dimension

The 12 categories in this dimension can be divided into two groups: the first seven categories are used to categorize the teacher's verbal behaviour during a lesson, and the last five categories consider the teacher's non-verbal behaviour during the lesson. The two groups of

categories are considered separately.

Teacher Verbal Categories. Inspection of the first seven categories in Table 5 shows that there were no significant differences ($p>0.05$) between the specialists and non-specialists in their use of the respective teacher verbal categories. A closer examination of the results shows that the non-specialists used the indirect teacher verbal categories (categories 1, 2, 3, 4) more frequently than the specialists. The physical education specialists used the direct teacher verbal categories 5 and 6 (5 - lectures; 6 - giving directions) more frequently than the non-specialists. However, these two categories were recorded as having a noticeably high frequency of occurrence for both groups of teachers.

Categories 5 (lecturing) and 6 (giving directions) accounted for 51.49% of the specialists', and 48.87% of the non-specialists' total recorded behaviour in the teacher verbal and non-verbal dimension. The discrepancy between the two groups for category 7 (criticizes and/or justifies authority) occurred because of the frequent use by one non-specialist (Table 12, Appendix D).

Teacher Non-Verbal Categories. The five non-verbal categories (categories 8, 9, M, D, S) enabled the observer to classify the teachers' actions even though they were not necessarily talking to the class. Table 5 indicates that no significant differences ($p>0.05$) were found between the two groups for any of the five categories. Category D (teacher demonstrating), category S (use of a stimulus), and category 8 (pupil(s) talking) occurred very infrequently (Table 12,

Appendix D). Category M (monitoring) which consisted primarily of the teacher observing the class, or a part of the class during a teacher directed activity session, was the category with the highest mean frequency for both groups (Specialists - 33.36% and Non-Specialists - 34.22%) in the Teacher Verbal and Non-Verbal Dimension.

Table 5

Paired Sample t Test Results of Specialist and Non-Specialist Teachers in the Teacher Verbal and Non-Verbal Dimension

Categories	Specialists (n=8)		Non-Specialists (n=8)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
1 Accepts Feelings	0.83	0.61	1.26	0.64	0.83
2 Praises and Encourages	3.67	1.61	4.43	2.54	0.77
3 Accepts Student(s) Ideas	1.15	1.04	1.64	1.37	0.22
4 Asks Questions	2.4	1.68	3.22	2.28	0.71
5 Lectures	26.33	4.99	24.05	6.91	0.56
6 Gives Directions	25.16	8.04	24.82	7.8	0.07
7 Criticizes	0.32	0.31	1.05	1.52	1.13
8 Student(s) Talking	4.02	3.64	3.13	2.76	0.44
9 Inaudible	0.0	0.0	0.0	0.0	--
M Monitoring	33.36	18.25	34.22	17.04	0.11
D Demonstrating	2.00	1.1	1.77	1.24	0.27
S Use of a Stimulus	0.62	0.57	0.29	0.6	1.18

(for $p=0.05$, $t= 2.36$)

Category 9 (teacher inaudible) did not occur because each teacher was wearing a microphone.

Although a noticeable difference occurred within both groups, categories 5 (lecturing), 6 (giving directions), and M (monitoring) combined, on the average accounted for approximately 83% of the total lesson time for each group of student teachers (Table 5).

Teacher Location Dimension

This dimension consists of three categories: P (teacher on the perimeter), L (teacher amongst the children), and X (teacher absent from the room), which consider the teacher's physical placement during the lesson. Table 6 indicates that no significant differences ($p > 0.05$), as determined by the Paired Sample t Tests (Zar, 1974:121-124) were found between the two groups of matched subjects.

Table 6

Paired Sample t Test Results of Specialist and Non-Specialist Teachers for the Teacher Location Dimension

Categories	Specialist (n=8)		Non-Specialist (n=8)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
P On the Perimeter	61.00	30.35	62.57	21.53	0.03
L Amongst the Children	38.98	28.9	37.35	21.13	0.11
X Absent from the Room	0.0	0.0	0.04	0.0	--

(for $p = 0.05$, $t = 2.36$)

Although a substantial variability exists within the group (Tables 13 and 16, Appendix D), both groups averaged almost two-thirds of the total lesson time in a position on the perimeter of the class. Category X (teacher absent from the room) only occurred once (for a 12 second period) with a non-specialist.

Child Activity Dimension

The Child Activity Dimension considers both "on task" and "off task" activity during a physical education lesson. The first

three categories (categories A, B, C) classify the specific teacher-directed activity regarding the percentage of students involved with tasks related to the purpose of the lesson.

The analysis, summarized in Table 7, yielded non-significant "t" values for each of the three categories. The non-specialists did average a higher percentage of time in category A while the specialists had a higher average of percentage of lesson time in category C. A survey of the raw data (Tables 14 and 17, Appendix D) reveals that a noticeable variability of frequency of occurrence within the two groups exists for the three categories related to the teacher directed activity. Both specialists and non-specialists had their classes involved in teacher directed activities for approximately 53% of the total lesson time. However, the percentage of total lesson time does not indicate the degree of participation each class member had during the lesson.

The three Child Activity Dimension categories not associated with "on task" activity are categories D (demonstrating), O (organizing), and W (waiting). No significant differences ($p > 0.05$) were found between the two groups (Table 7) for any of the three categories. The non-specialists had the child(ren) demonstrate (category D) to the class more often than the specialists. The specialists had their classes spend more time in organizational activities during the lesson (Table 17, Appendix D).

Category W (waiting) was recorded as the most dominant category in the Child Activity Dimension for both groups. The specialists did not have their classes waiting for a teacher directed activity for as long a period of time as the non-specialists (30.05% and 33.42%

respectively). It is interesting to note that both groups kept the pupils inactive for approximately one-third of the total physical education lesson time.

Table 7

Paired Sample t Test Results of Specialist and Non-Specialist Teachers for the Child Activity Dimension

Categories	Specialists (n=8)		Non-Specialists (n=8)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
A Maximum on Task	20.52	11.32	21.11	11.67	0.01
B Average on Task	10.82	7.52	8.48	8.69	0.10
C Minimum on Task	23.39	21.29	22.80	21.96	0.04
D Demonstrating	3.83	2.96	5.14	7.11	0.29
O Organizing	11.34	1.57	8.99	3.57	1.53
W Waiting	30.05	7.2	33.42	11.31	0.18

(for $p = 0.05$, $t = 2.36$)

Summary of the Behavioural Differences between Specialists and Non-Specialists

When examining the raw data (Tables 12, 13, 14, 15, 16, 17, Appendix D), it is clear that considerable variability exists within each group for the 21 behavioural categories. However, after applying the Matched Paired "t" Test to the data, it was found that no statistically significant differences existed between the groups for any of the categories.

Relationship between Behavioural Patterns and Effectiveness in Teaching a Physical Education Lesson

As there were no significant differences in the examined behavioural patterns between the specialist and non-specialist groups

involved in the study, it was decided to study whether there was a relationship between behavioural patterns and teaching effectiveness between the most effective and least effective teachers. For this part of the study eight subjects, disregarding specialization or non-specialization in physical education were considered. The four most effective teachers (teachers with overall rank 1, 2, 3, 4) were compared with the four least effective teachers (teachers with overall rank 13, 14, 15, 16).

The 21 behavioural categories (Gasson's Three Dimensional System) for the eight subjects were the same as those used in question two of the study. All data (Tables 18, 19, 20, Appendix D) were subject to the Separate Variance "t" Test (Popham and Sirotnik:1973, 121-140) for analysis. The results for the three behavioural dimensions (Teacher Verbal and Non-Verbal, Teacher Location, and Child Activity) are considered separately.

Teacher Verbal and Non-Verbal Dimension

Teacher Verbal Categories. Table 8 shows that there were no significant differences ($p > 0.05$) in the verbal behaviour between the most effective and least effective student teachers. However, the most effective teachers were inclined to use the indirect teacher verbal categories (praise and encouragement, accepts feelings, accepts student(s) ideas, and asks questions) more frequently than the least effective teachers.

For both groups, the most effective and least effective teachers, a considerable percentage of the lesson time was spent either lecturing

or giving directions (most effective teachers 47.29% and least effective teachers 51.58%) to the class. Category 7 (criticizing or justifying authority) was used considerably more by the least effective teachers (Table 18, Appendix D) due in part to the very frequent use of criticism by a single student teacher.

Table 8

Separate Variance t Test Results of the Most Effective and the Least Effective Teachers in the Teacher Verbal and Non-Verbal Dimension

Categories	Most Effective (n=4)		Least Effective (n=4)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
1 Accepts Feelings	0.82	.22	0.66	.51	0.21
2 Praises and Encourages	5.40	1.68	4.86	2.10	0.51
3 Accepts Student(s) Ideas	1.84	1.33	0.63	.39	0.92
4 Asks Questions	2.28	1.13	1.79	.65	0.2
5 Lectures	24.05	6.41	23.15	6.00	0.83
6 Gives Direction	23.24	5.34	28.43	10.05	0.57
7 Criticizes	0.22	.08	1.85	1.83	1.69
8 Student(s) Talking	3.78	3.85	2.68	3.05	0.43
9 Inaudible	0.0	0.0	0.0	0.0	--
M Monitoring	35.20	10.9	33.62	11.71	0.06
D Demonstrating	2.29	.54	1.94	.82	0.90
S Use of Stimulus	0.84	0.43	0.0	0.0	1.68

(for $p = 0.05$, $t = 3.18$)

Teacher Non-Verbal Categories. Although no significant differences ($p > 0.05$) existed between most effective and least effective teachers, Table 8 shows that the most effective teachers had a higher mean percentage of use for the four recorded categories. For categories 8, M, and S there is considerable variability within each group (Table 18, Appendix D). Although infrequent, the effective teachers were recorded as using a stimulus (category S), e.g. whistle, during the

lesson, while none of the least effective teachers were recorded as using any form of stimulus. Both groups used some form of teacher demonstration (category D) as a part of their teaching method. Both groups monitored (category M) their class during teacher directed activity sessions for approximately one-third of the total lesson time.

In summarizing the analysis of Teacher Verbal and Non-Verbal behaviour (Table 8), it appears that the effective teachers spend less time giving specific directions during the learning experiences and more time (non-significantly) in the other categories than the less effective teachers.

Teacher Location Dimension

Analysis of the location of the teacher (Table 9) in relation to the position of the class yielded non-significant differences ($p > 0.05$), although the most effective teachers spent more time amongst the children (category L - 51.71%) in preference to being in a position where all the class can be seen at a glance (category P - 47.97%). In contrast, the least effective teachers spent 73.11% of their time on the perimeter of the class (category P) and only 26.87% of the total lesson time amongst the children (category L).

However, when considering the variability within the groups (Table 19, Appendix D) it could be inferred that the most effective teachers are more consistent in their position in relation to the position of the class during the teaching of a physical education lesson.

Table 9

Separate Variance t Test Results of the Most Effective and Least Effective Teachers in the Teacher Location Dimension

Categories	Most Effective (n=4)		Least Effective (n=4)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
P On the Perimeter	47.97	14.61	73.11	25.64	1.74
L Amongst the Children	51.71	20.71	26.87	25.60	1.83
X Absent from the Room	--	--	--	--	--

(for $p = 0.05$, $t = 3.18$)

Child Activity Dimension

The Child Activity Dimension considers both "on task" activity (teacher directed) and "off task" activity (not specified learning activities) which occur during the lesson. The first three categories (categories A, B, and C) indicated the percentage of the total class involved in specific teacher directed activities related to the purpose of the lesson. Table 10 shows that a significant difference ($p < 0.05$) existed in the use of category A (over 75% of the class "on task") between the two groups. The most effective teachers averaged 35.06% of the total lesson time involving the majority of the class in "on task" activities compared to an average of 12.15% of the total lesson time used by the least effective teachers. It is interesting to note that none of the least effective teachers had a higher percentage of use in category A than any of the four most effective teachers (Table 20, Appendix D).

Table 10

Separate Variance t Test Results of the Most Effective and Least Effective Teachers in the Child Activity Dimension

Categories	Most Effective (n=4)		Least Effective (n=4)		"t" Value
	\bar{x}	S.D.	\bar{x}	S.D.	
A Majority "On Task"	35.06	5.68	12.15	10.68	3.78*
B Average "On Task"	8.46	5.95	10.61	12.69	0.36
C Minimal "On Task"	9.11	4.74	33.81	24.46	1.97
D Demonstrating	6.73	10.04	3.17	2.84	0.68
O Organization	10.06	3.05	8.5	4.28	0.61
W Waiting	30.74	8.56	31.7	11.35	0.02

(for $p = 0.05$, $t = 3.18$)

* denotes $p < 0.05$

Both groups had a similar mean percentage of total lesson time in category B (approximately half of the class "on task") although the least effective teachers had much more variability within their group. Although a large difference exists between the group means for category C (less than a quarter of the class "on task") this was found to be statistically non-significant ($p > 0.05$). When examining the raw data (Table 20, Appendix D) it is noted that a considerable variability exists with the group of least effective teachers in their use of category C compared to a lesser variability for the most effective teachers' group.

In summarizing for the three "on task" categories, both groups had the class participating in teacher directed activities for slightly more than half of the lesson. However the main difference between the

most effective and least effective teachers is that the former group had a much larger percentage of the total class involved for a greater portion of the total lesson time.

For the three "off task" categories (categories D, O, and W), Table 10 shows that no significant differences ($p > 0.05$) existed between the two groups. The most effective teachers used more time in having the children demonstrate (category D) to the class, which in part is due to one teacher having the children demonstrate for 24.15% of the total lesson time (Table 20, Appendix D). Both groups used approximately one-tenth of the total lesson time for organizational purposes (category O). Although the difference between the group means for category W (waiting) is only one percent, the least effective teachers have a much greater variability within the group than the most effective teachers. Both groups had their children inactive for approximately one-third of their physical education lesson time.

Summary of the Relationship between Behavioural Patterns and Teaching Effectiveness

When considering the 21 behavioural categories, the most effective teachers showed less variability as a group than the least effective teachers. This appears to imply that the most effective teachers were more inclined to display a similar, but more diverse behavioural pattern (as demonstrated by Gasson's Three Dimensional Interaction Analysis System), than the least effective teachers when teaching a physical education lesson. The most noticeable relationship between behaviour and effective physical education teaching, as demonstrated by this study, is that the most effective teachers provide

for a much greater percentage of the lesson time for the majority of the class to be involved in a teacher directed physical education activity. Although the quality of the activity was not considered separately, the children were being given a greater opportunity to participate.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

The purpose of this study was to explore the teaching effectiveness of physical education specialist and non-specialist student teachers when teaching a similar physical education lesson. In the design of the study, the initial issue was divided into three problems. The conclusions, discussion, and implications of each of these problems will be presented in this chapter.

Differences in Teaching Effectiveness between Specialist and Non-Specialist Student Teachers

Findings

1. There was no significant difference between the overall teaching effectiveness of the specialist and non-specialist physical education student teachers.
2. The two most effective and the three least effective student teachers were physical education specialists.

Discussion

To compare the teaching effectiveness of the two groups of student teachers, three judges viewed and ranked the 16 videotaped lessons using a global rating: Kay and Rosner (1974), Goldberger (1974),

Berliner (1975), Borg (1975), Shavelson and Dempsey-Atwood (1976), Darst (1977), and McLeish (1978) support this method of examining the teaching process.

It is interesting to note that no significant difference exists between the two groups. An examination of the course content related to the methods of teaching physical education reveals that the specialists have a considerable amount more time on both course work and teaching practice. The specialists also receive some subjectively based feedback on their teaching effectiveness when teaching physical education. The non-specialists had received only one course specific to physical education which occurred during their professional year. Although there is a difference in the training programme, the results of this study indicate that it does not appear to be wise to label the student teachers as either specialists or non-specialists at teaching physical education in the elementary school this early in their teacher education.

Behavioural Differences between Specialist and Non-Specialist Student Teachers

Findings

1. No significant differences existed between the behavioural patterns of the specialist and non-specialist student teachers when teaching a physical education lesson in the elementary school.
2. A considerable variability existed within each group for the 21 behavioural categories as determined by Gasson's Three Dimensional System of Interaction Analysis.
3. The amount of "on task" activity time provided for the individual child by both groups of teachers was a relatively small percentage

of the total lesson time.

Discussion

An analysis of the behavioural pattern revealed a predominant pattern of teaching for both groups of teachers was to: (1) spend 25% of the lesson time lecturing to the class, (2) spend 25% of the lesson time giving directions to the pupils while they were actively involved at a teacher directed activity, and, (3) spend 33% of the total lesson time watching the class during a specific activity. The sequential pattern of, teacher talk — student listen — student move — teacher watch, which was described by Anderson (1975) as being a characteristic of physical education teaching has been supported by the results of this study. Similar findings have also been reported by Nygård (1975), and, Cheffers and Mancini (1978).

It was also interesting to note that both groups of teachers spent approximately 62% of the total lesson time in a position on the perimeter of the class, which enabled them to observe the class easily, at the same time being suitably positioned for communicating verbally with the class at the risk of decreasing personal proximity. For the other 38% of the lesson time the teacher was moving amongst the class.

Approximately equal periods of time were provided by both groups of teachers for the children to participate in a teacher-directed activity. Fifty-three percent of the lesson time was directed towards student participation. This figure can be misleading and needs to be separated into the three "on task" categories in order to obtain a more meaningful understanding of approximately how much specific learning

activity each individual had.

1. For 21% of the lesson time, more than three-quarters of the class were actively involved.
2. For 10% of the lesson time, approximately half the class were actively involved.
3. For 22% of the lesson time, less than one-quarter of the class were actively involved.

This seems to indicate that the amount of "on task" behaviour by each class member was a relatively small percentage of the available lesson time. This could possibly be explained by the inability of some teachers to organize and manage a class. Brophy and Everston (1974), McDonald (1976), and Locke (1978) generally agree that poor management provides less opportunity for active participation in specific learning activities which are planned by the teacher. As the findings regarding "on task" activity for both groups of students were similar, there seem to be some implications for the content of the physical education teaching methodology courses. Namely, physical education methods courses should place more emphasis on teacher organization and class management in an effort to have a greater percentage of the lesson time being used for individual participation in the planned physical education activities.

Behavioural Differences between the Most Effective
and the Least Effective Physical Education
Student Teachers

Findings

1. The most effective teachers displayed a more versatile behavioural

pattern, as determined by the Teacher Verbal and Non-Verbal Dimension, when teaching a physical education lesson.

2. Neither the most effective nor the least effective teachers showed any consistency in their physical location in relation to the class while teaching a physical education lesson.
3. The most effective teachers provided each child in the class with approximately three times as much "on task" activity as did the least effective teachers.
4. Both groups of teachers kept the children inactive for approximately one-third of the total lesson time.

Discussion

It is worth noting the composition of the two groups for this issue: (1) most effective teachers — two specialists and two non-specialists, (2) least effective teachers — three specialists and one non-specialist. The results indicate that similar teacher verbal and non-verbal behavioural patterns were recorded for both groups with approximately 83% of the lesson time being spent either lecturing, giving directions, or watching the class. The most effective teachers were recorded as, accepting the feelings of the students, praising and encouraging the students, accepting the student(s) ideas, asking questions, demonstrating, and using a stimulus more frequently than the least effective teachers. The least effective teachers criticized and justified authority more often while teaching than the most effective teachers.

The lack of consistency in the teachers' physical location in

relation to the class while teaching can probably be explained by the differences in the content of the observed lessons. Perhaps the student teachers' awareness of the importance of their location while teaching a physical education lesson should be questioned.

When considering the amount of time provided for individual participation by each group, the most effective teachers used 32.78%, 31.00%, 41.86%, and 31.63% respectively, of the lesson for involving over three-quarters of the class at any one time compared to the least effective teachers who used 13.06%, 0.0%, 28.84%, and 6.71% respectively. In contrast, the least effective teachers provided a much greater percentage of the lesson time for having less than one-quarter of the class involved at one time. It can therefore be inferred that for much of the time during the teacher directed "on task" activity, the least effective teachers had a larger number of inactive children waiting for their turn to participate in the designated activity.

These findings reflect the concept that good classroom management will result in more time for the individual on the learning task (p. 15). Therefore it could be implied from the results of this study that one important characteristic of effective physical education teaching is to ensure that a considerable percentage of the lesson time is spent involving the majority of the class in an "on task" activity.

Suggestions for Further Research

The present study has answered three questions but it has also revealed several areas which need further research. A few of them are presented in the following paragraphs.

The writer is not aware of any other study investigating the difference between specialist and non-specialist physical education student teachers. There is, therefore, a definite need to replicate the reported study using a larger number of subjects in order to either support or refute the findings of this study.

When using a global rating to determine the effectiveness of physical education teaching, there is a possibility that three judges will not perceive all the behaviours during their observation of the lesson. Perhaps a larger number of judges should be used to develop the set of criteria on which to base their decision about the effectiveness of the observed teaching.

Future studies should also attempt to ascertain whether or not there are any differences between: (1) experienced specialist and non-specialist physical education teachers, and (2) student teachers and experienced teachers teaching physical education. Similarly a comparison could be made between the most effective and least effective experienced physical education teachers.

It is also recommended that future studies consider observing each teacher teaching more than one lesson and compare the observed behaviours with outcome measures. Although descriptive data taken directly from the learning environment provides an insight about what actually happens, empirical support for this information could provide more meaningful information about the effectiveness of teaching physical education in the elementary school.

BIBLIOGRAPHY

- Ager, Merlin. "Dogmatism and the Verbal Behaviour of Student Teachers." Journal of Teacher Education, 21:179-183. Summer, 1970.
- Anderson, W.G. "Descriptive and Analytic Research on Teaching." Quest, Monograph 15:1-8. 1971.
- _____. "Videotape Data Bank." Journal of Physical Education and Recreation, 46:31-34. September, 1975.
- _____, and G. T. Barrette. "Teacher Behaviour." In What's Going on in the Gym: Descriptive Studies of Physical Education Classes. William G. Anderson and Gary T. Barrette (eds.). Monograph No. 1, Motor Skills: Theory Into Practice, pp. 25-38. 1978.
- Bahneman, Carl P. "The Relationship Between Personality and Verbal Behaviour of Physical Education Teachers." Physical Educator, 30:144-145. October, 1973.
- Beckner, W.E. "Becoming Acquainted With Teaching — A Better Way." Journal of Teacher Education, 19:67-71. September-October, 1978.
- Berliner, David C. "Impediments to the Study of Teacher Effectiveness." Journal of Teacher Education, 27:5-11. Spring, 1976.
- _____, and William J. Tikunoff. "The California Beginning Teacher Evaluation Study: Overview of the Ethnographic Study." Journal of Teacher Education, 27:24-30, Spring, 1976.
- Biddle, Bruce J. "Integration of Teacher Effectiveness Research." In Contemporary Research on Teacher Effectiveness. Bruce J. Biddle and William J. Ellena (eds.). New York: Holt, Rinehart and Winston Inc., 1964. 1-40.
- Bondi, Joseph C. "Feedback from Interaction Analysis: Some Implications for the Improvement of Teaching." Journal of Teacher Education, 21:189-196. Summer, 1970.
- Boocock, S. S. "Toward a Sociology of Learning: A Selective Review of Existing Research." Sociology of Education, 39:1-35. Winter, 1966.

- Bookhout, Elizabeth C. "Teaching Behaviour in Relation to the Social Emotional Climate of Physical Education Classes." Research Quarterly, 38:336-347. October, 1967.
- Borg, Walter R. "Moving Towards a Breakthrough in Teacher Education." Education, 95:302-324. 1975.
- Brophy, Jere E. "Reflections on Research in Elementary Schools." Journal of Teacher Education, 27:31-34. Spring, 1976.
- _____, and C.M. Everston. Learning from Teaching: A Developmental Perspective. Boston: Allyn and Bacon, 1976.
- Cheffers, John T. F. "The Validation of an Instrument Designed to Expand the Flanders System of Interaction Analysis to Describe Non-Verbal Interaction, Different Varieties of Teacher Behavior and Pupil Responses." Abstract in Dissertation Abstracts International, 34:1674A. October, 1973.
- _____. "Observing Teaching Systematically." Quest, Monograph 28: 17-28. Summer, 1977.
- _____, and Victor H. Mancini. "Teacher-Student Interaction." In What's Going on in the Gym: Descriptive Studies of Physical Education Classes. William G. Anderson and Gary T. Barrette (eds.). Monograph No. 1, Motor Skills: Theory Into Practice, pp. 39-50. 1978.
- Coker, Homer. "Identifying and Measuring Teacher Competencies: The Carroll County Project." Journal of Teacher Education, 27:54-56. Spring, 1976.
- Cooper, S.H. "Hope for the Future: A View of Research in Teacher Effectiveness." Quest, Monograph 28:29-37. Summer, 1977.
- Costello, John, and Susan A. Laubach. "Student Behaviour." In What's Going on in the Gym: Descriptive Studies of Physical Education Classes. William G. Anderson and Gary T. Barrette (eds.). Monograph No. 1, Motor Skills: Theory Into Practice, pp. 11-24. 1978.
- Darst, Paul W. "The Use of Descriptive-Analytic Instruments for Pre-Service and In-Service Training of Physical Education Teachers." The Physical Educator, 34:74-76. May, 1977.
- Flanders, Ned A. Teacher Influence, Pupil Attitudes and Achievement. Washington: United States Government Printing Office, 1965. 2-47.
- _____. Analyzing Teaching Behaviour. Reading, Mass.: Addison-Wesley Publishing Co. Inc., 1970.
- _____. "The Changing Base of Performance-Based Teaching." Phi Delta Kappan, 55:312-315. January, 1974.

- Fishman, Sylvia E., and William G. Anderson. "Developing A System For Describing Teachers." Quest, Monograph 17:9-16. January, 1971.
- Gasson, Ivo Stuart Henry. The Development of an Observational Instrument to Record Selected Teacher-Pupil Behaviours in Primary School Physical Education. Unpublished doctoral dissertation. Ohio State University, 1971.
- _____. "Basis for Conducting Descriptive Analytic Research on the Teaching Process." Unpublished paper. January 27, 1976.
- Goldberger, Michael. "Studying Your Teaching Behavior." Journal of Health, Physical Education and Recreation, 45:33-36. March, 1974.
- Herbert, J., and C. Attridge. "A Guide for Developers and Users of Observation Systems and Manuals." American Educational Research Journal, 12:1-20. 1975.
- Hughley, C. "Modification of Teaching Behaviours in Physical Education." Abstract in Dissertation Abstracts International, 34:2368A. November, 1973.
- Kay, Patricia M. "Assessing Pre-Service Teachers Competence." Journal of Teacher Education, 29:7-8. March-April, 1978.
- _____, and Benjamin Rosner. "Are Teachers Colleges Really Prepared to Handle Competency Based Teacher Education." Journal of Research and Development in Education, 7:45-51. Fall, 1978.
- Keith, L. T., L.G. Tornatsky, and L.E. Pettigrew. "An Analysis of Verbal and Non-Verbal Classroom Teaching Behaviours." The Journal of Experimental Education, 42:30-38. Summer, 1974.
- Kennedy, John J., and Andrew J. Bush. "Overcoming Some Impediments to the Study of Teacher Effectiveness." Journal of Teacher Education, 27:14-17. Spring, 1976.
- Locke, L. "Research on Teaching Physical Education: New Hope for a Dismal Science." Quest, Monograph 28:2-16. Summer, 1977.
- _____. "Learning from Teaching." Address presented at the British Columbia Physical Education Teachers Conference. June, 1978. Tape available from the School of Physical Education, University of Victoria.
- _____, and John E. Nixon. "Research of Teaching Physical Education." In Second Handbook of Research on Teaching. Robert M.W. Travers (ed). Chicago: Rand McNally and Co., 1973. 1210-1242.
- McDonald, Frederick J. "Report on Phase II of the Beginning Teacher Evaluation Study." Journal of Teacher Education, 27:39-42. Spring, 1976.

- _____. "Evaluating Pre-Service Teacher Competence." Journal of Teacher Education, 29:9-13. March-April, 1978.
- McKeachie, W.J., and Yi-Guang Lin. "Student Rating of Teacher Effectiveness: Validity Studies." American Educational Research Journal, 8:435-445. May, 1971.
- McLeish, John. "Effective Teaching: A New Analysis." British Journal of Teacher Education, 4:215-222. October, 1978.
- Medley, Donald M. "Closing the Gap Between Research in Teacher Effectiveness and the Teacher Education Curriculum." Journal of Research and Development in Education, 7:39-46. Fall, 1973.
- Meux, M., and B.O. Smith. "Logical Dimensions of Teacher Behavior." In Contemporary Research on Teacher Effectiveness. Bruce J. Biddle and William J. Ellena (eds.). New York: Holt, Rinehart and Winston, Inc., 1964. 127-164.
- Musella, Donald. "Improving Teacher Education." Journal of Teacher Education, 21:15-22. Spring, 1970.
- Nyglund, Gary. "Interaction Analysis of Physical Education Classes." Research Quarterly, 46:351-357. October, 1975.
- Pedersen, K. George. "Improving Teacher Effectiveness." Education Canada, 15:12-20. Fall, 1975.
- Popham, W. James. "Performance Tests of Teaching Proficiency: Rationale, Development, and Validation." American Education Research Journal, 8:105-117. January, 1971.
- _____, and K. Sirotnik. Educational Statistics Use and Interpretation. (2nd ed.). New York: Harper and Row, 1973.
- Rankin, K. D. "Verbal and Non-Verbal Interaction Analysis of Student Teachers with Students in Elementary Physical Education." Abstract in Dissertation Abstracts International, 37:181A. July, 1976.
- Reynolds, Richard J. "Classroom Verbal Interaction Patterns as a Function of Instructor Cognitive Complexity." Journal of Teacher Education, 21:59-64. Spring, 1970.
- Rosenshine, B., and N. Furst. "The Use of Direct Observation to Study Teaching." In Second Handbook of Research on Teaching. Robert W. M. Travers (ed.). Chicago: Rand McNally, 1973. 122-183.
- _____. "Academic Engaged Time, Content Covered, and Direct Instruction." Journal of Education, 160:38-64. August, 1978.

- Ryans, D.C. Characteristics of Teachers, Their Descriptions, Comparison and Appraisal: A Research Study. Washington: American Council on Education, 1960.
- Saedeh, Ibrahim Q. "Teacher Effectiveness or Classroom Efficiency: A Direction in the Evaluation of Teaching." Journal of Teacher Education, 21:73-91. Spring, 1970.
- Shavelson, Richard, and Nancy Dempsey-Atwood. "Generalizability of Measures of Teaching Behavior." Review of Educational Research, 46:553-611. Fall, 1976.
- Siedentop, Daryl, and Carey Hughley. "Ohio State University Teacher Behaviour Rating Scale." Journal of Physical Education and Recreation, 46:45. February, 1975.
- Singer, R.N., and D.A. Pease. "A Comparison of Discovery Learning and Guided Instructional Strategies on Motor Skill Learning Retention." Research Quarterly, 47:797-803. 1976.
- Soar, R.S. "Problems in Analyzing Process-Product Relationship in Studies of Teacher Effectiveness." Journal of Education, 160: 96-116. August, 1978.
- Skinner, B.F. About Behaviorism. New York: Alfred A. Knopf, 1974. 185.
- Zar, Jerrold H. Biostatistical Analysis. Englewood Cliffs, N.J.: Prentice-Hall, 1974.

APPENDIX A
GASSON'S THREE DIMENSIONAL SYSTEM OF INTERACTION ANALYSIS

Gasson's Three Dimensional System of Interaction Analysis

The theoretical model of teaching on which this instrument is based comprises a set of behaviours which are thought to be symptomatic of effective class management and efficient teaching of physical education. They are as follows:

1. When speaking to the whole class the teacher should:
 - (a) obtain silence and attention;
 - (b) be in a position to see the whole class.
2. When the pupils are actually working, the teacher should move among them observing and commenting on their performance.
3. When the whole class is temporarily engaged in arranging apparatus, and/or discussion, the teacher should make this event as short as possible, and aim to have the resultant organization facilitate a high activity ratio.

Characteristics of the system include:

1. That it is simple and easy to use by one observer.
2. The choice of using it in live situations and/or by videotape recording.
3. The possibility for recording verbal and non-verbal behaviours of both teacher and pupils.
4. That it provides the possibility for recording specifically the events peculiar to physical education settings.
5. A wide selection of teacher and pupil behaviours within the theoretical model of teaching upon which it is based are able to be recorded.

Behavioural Categories

The 21 behavioural categories for the observation instrument are grouped in the following three dimensions.

I The Teacher Verbal and Non-Verbal Dimension

(This dimension is a modification of the Flanders' Interaction Analysis System specifically designed for use during a physical education class.)

1. Accepts Feelings. The teacher accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings, and understanding the expressed emotions by the student(s) are included.
2. Praises or Encourages. Praises and/or encourages student action and behaviour. Jokes that release tension, but not at the expense of another individual. Includes positive verbal comments by the teacher, one single word or expression, teacher response to individual and group behaviour.
3. Accepts or Uses Ideas of Student(s). Clarifying, building or developing ideas suggested by a student. May restate the student's idea, or respond to a student's question, comment or answer. As the teacher brings his own ideas into play, shift to category 5.
4. Asks Questions. Asking a question about content or procedures with the intent that a student answer.
5. Lecturing. Giving facts, information, or opinions about content

or procedures, expressing own ideas, asking rhetorical questions. Giving directions, commands, or orders with which the student is expected to comply. This may be often found at the introduction to or review of tasks.

6. Directions. Teacher's directions which tell the children to perform an activity task. The teacher may lead an activity, provide continual verbal input relating to the activity during student performance. This category is used only when the student's compliance would take the form of an observable act.
7. Criticizing or Justifying Authority. Statements intended to change student behaviour from non-acceptable to acceptable pattern, reprimanding negative feedback.
8. Pupil(s) Talking. Pupil(s) verbalizing to the teacher sequentially or simultaneously when the total class is inactive. Includes pupil(s) asking questions.
9. Inaudible. Verbal communication by the teacher which is inaudible to the observer.
- M. Monitoring. Events not recorded by any of the other categories in this dimension. (Usually when the teacher is silent and not demonstrating.) Organizational event.
- D. Teacher Demonstrating. The teacher demonstrated to the total class, teacher speech may accompany the demonstration.
- S. Stimuli. Other than the teacher's verbal behaviour used to direct or accompany the student's activity, e.g. clapping, whistle blowing, etc. to replace verbal class commands.

II The Location of the Teacher Dimension

- P. Perimeter. The teacher is located in a "perimeter" position and generally able to see all the students with a glance that requires less than a 180^o head movement.
- L. Amongst. The teacher is located amongst the students.
- X. Absent. The teacher is absent from the room.

III The Child Activity Dimension

- A. Majority "on task" activity. Less than one-quarter of the students not attempting the task set by the teacher.
- B. Average "on task" activity. Between one-quarter and three-quarters of the students are involved in the "on task" activity.
- C. Minimal "on task" activity. Less than one-quarter of the students are attempting the task set by the teacher.
- D. Demonstration. A demonstration by one or more children while the rest of the class observe.
- O. Organization. Any organizational activity with or without apparatus which involves using some or all of the students while no "on task" activity is being performed. Includes getting into teams, position, numbering, etc.
- W. Off-task activity. Other behaviours not recorded by any of the other categories in this dimension, e.g. listening, waiting, watching the teacher, disruptive behaviour, while class is inactive.

Recording Procedures

Gasson suggested that the appropriate categories, one from each dimension (Teacher Behaviour, Teacher Location, and Child Activity) be recorded sequentially at five second intervals.

For this study, the observer viewed each videotape separately for each dimension, observing for two seconds and recording for one second. This allowed each lesson to be divided into three second time segments. Each time segment contained one category from each dimension (Figure 1).

At the completion of observing the lesson, the observer was able to tally the frequency of occurrence for each category. From the collected data, the percentage of time spent in each of the 21 categories was calculated (Table 11, Appendix D).

Figure 1 is an example of the first ten minutes from a recording sheet.

Name: M. Rouwerda School: Willows Grade: 5 Non-Specialist

4	P	W	4	P	W	8	P	W	4	P	W	4	P	W	8	P	W
3	P	W	8	P	W	3	P	W	5	P	W	5	P	W	5	P	W
5	P	W	5	P	W	5	P	W	4	P	W	8	P	W	8	P	W
8	P	W	8	P	W	4	P	W	4	P	W	4	P	W	8	P	W
8	P	W	8	P	W	8	P	W	5	P	W	5	P	W	5	P	W
5	P	W	5	P	W	5	P	W	4	P	W	8	P	W	8	P	W
8	P	W	3	P	W	5	P	W	5	P	W	5	P	W	5	P	W
5	P	W	5	P	W	5	P	W	6	P	W	6	P	O	6	P	O
6	P	O	5	P	O	5	P	O	5	P	O	5	P	W	6	P	W
6	P	O	6	P	O	6	P	O	6	P	O	5	P	W	5	P	W
5	P	W	4	P	W	5	P	W	5	P	W	5	P	W	5	P	W
5	P	W	5	P	O	5	P	O	5	P	O	6	P	O	6	P	O
6	P	O	6	P	O	5	P	O	5	P	O	5	P	O	5	P	O
5	P	O	5	P	O	4	P	O	8	P	O	3	P	O	5	P	W
5	P	W	5	P	W	5	P	W	5	P	W	5	P	W	5	P	W
6	P	D	6	P	D	6	P	D	5	L	W	D	L	W	D	L	W
5	L	W	5	L	W	5	L	A	6	L	A	M	L	A	M	L	A
M	L	A	M	L	A	6	L	A	6	L	A	6	P	A	6	P	B
M	P	B	M	P	B	M	P	B	M	P	B	6	P	B	6	P	C
M	P	C	5	P	W	5	P	W	4	P	W	4	P	W	8	P	W
8	P	W	4	P	W	3	P	W	3	P	W	8	P	W	5	P	W
4	L	W	6	L	W	5	P	B	8	P	B	8	P	B	5	L	B
5	L	B	5	L	W	7	L	W	M	L	W	4	L	W	8	L	W
6	L	W	6	L	A	3	L	A	M	L	A	5	L	A	5	L	A
5	L	A	M	L	A	5	L	A	7	L	A	5	L	A	5	L	A
5	L	A	4	L	A	5	L	A	8	L	A	3	L	A	4	L	A
4	L	A	3	L	A	7	L	A	M	L	C	7	L	W	M	L	W
5	L	W	4	L	W	8	L	W	5	L	W	3	L	W	5	L	W
5	L	W	5	L	W	4	L	W	8	L	W	5	L	W	5	L	W
D	P	W	D	P	W	D	P	W	5	P	W	6	P	C	6	P	C
6	P	C	M	P	C	M	L	B	M	L	B	M	L	B	M	L	B
6	P	B	6	P	B	M	P	A	M	P	A	M	P	A	M	P	A
7	P	A	7	P	A	2	L	A	2	L	B	M	L	B	M	L	B
5	L	C	5	L	W												

Figure 1

The First Ten Minutes of a Recording Sheet
(Recording across the chart)

Table 11

Frequency of Occurrence and Percentage of Lesson Time for each of the 21 Behavioural Categories

Teacher Verbal and Non-Verbal Dimension		
Category	Frequency of Occurrence	Frequency of Occurrence in Percentage of Lesson Time
1	3	1.5%
2	2	1.0%
3	9	4.5%
4	21	10.5%
5	79	39.5%
6	31	15.5%
7	3	1.5%
8	22	11.0%
9	0	0 %
M	25	12.5%
D	5	2.5%
S	0	0 %
	<u>200</u>	<u>100.0%</u>

Teacher Location Dimension		
Category	Frequency of Occurrence	Frequency of Occurrence in Percentage of Lesson Time
P	132	66.0%
L	68	34.0%
X	0	0 %
	<u>200</u>	<u>100.0%</u>

Child Activity Dimension		
Category	Frequency of Occurrence	Frequency of Occurrence in Percentage of Lesson Time
A	36	18.0%
B	20	10.0%
C	8	4.0%
D	3	1.5%
O	26	13.0%
W	107	53.5%
	<u>200</u>	<u>100.0%</u>

APPENDIX B

DETAILS FOR THE PHYSICAL EDUCATION LESSON TO BE VIDEOTAPED

TO: _____

Details for the Physical Education
Lesson to be Videotaped

In order to maintain some similarity in procedure and commonality in the lesson in general, each student will be asked to use the same lesson theme.

Lesson Theme

To provide experiences which will enhance each child's balancing ability. (Balance is referred to as an Element of Movement related to Body Awareness, for all grades, p. 55, British Columbia Physical Education Curriculum Guide.)

Lesson Plan

1. Plan a twenty-five minute lesson.
2. You are free to use any method that you wish, e.g. traditional, creative, thematic, but keep the lesson theme in mind.
3. There is no restriction on the use of equipment.
4. For filming purposes you are limited to approximately one-half of the available floor space. (See the diagram on the following page.) Consider this when planning.

Some Guidelines about Balance
Activities

1. Develop activities for either static (non-moving) and/or dynamic (moving) balance with or without equipment.
2. Use individual and/or paired activities, teacher directed problem solving approach, exploratory activities.

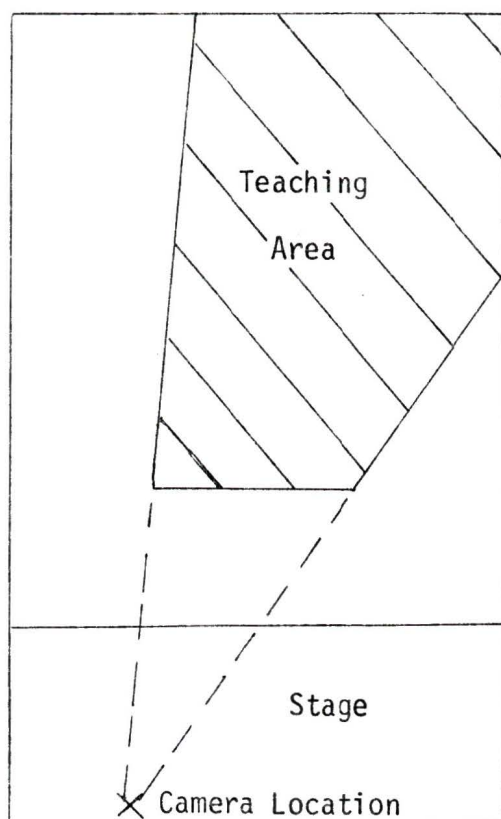
3. Some minor games are balance dominated.
4. Many gymnastic activities could be included under balance.

Date

Your school Principal has been contacted. Once I receive his approval you will be informed through the school of a date and time. This will not be likely to occur until after Easter.

Recording

The camera will be set up on the stage. (If there is not a stage then I will film from a corner of the gym.) I will be asking you to wear a very small cordless microphone.



APPENDIX C
LETTER REQUESTING SCHOOL APPROVAL

March 13, 1979

Dear

As a part of my requirements for the Master of Arts programme at the University of Victoria, I am conducting a research project on Student Teacher and Child Behaviour in the Gymnasium during a Physical Education lesson. Please see enclosed note for details.

In order to collect the appropriate data, I would appreciate being able to visit your school between April 17th and May 10th to videotape one Physical Education lesson. One of the randomly chosen subjects, Student Teacher _____ has been assigned to your school for the six week teaching practice session. The University, and both the student, and the Supervisor have given their approval for my project.

I am writing to ask for your permission to visit your school to film one Physical Education lesson being taught by the named Student Teacher, at a date and time to be agreed upon. I would be grateful for your approval to visit your school for this purpose. Please sign the enclosed form and mail it to me in the self-addressed envelope. I shall let you know well ahead of time about the precise day and hour that I shall be visiting your school.

Yours very truly,

Bevan C. Grant, Student

Dr. F. L. Martens, Thesis Committee
ChairmanDr. B. L. Howe, Chairman
Physical Education Department

BCG/ma

Encl.

APPENDIX D
SUMMARY OF THE RAW DATA

Table 12

Frequency of Occurrence for the Verbal and Non-Verbal Teacher Behaviour
Dimension Categories for Matched Pairs of Physical Education
Specialist and Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
1 Accepts Feelings	10	7	1	2	9	4	11	4	13	7	9	9	5	1	4	12
2 Praises and Encourages	57	21	12	25	3	26	17	15	10	21	50	20	36	13	29	18
3 Accepts Students Ideas	20	7	3	18	18	0	7	1	2	5	7	4	4	4	23	11
4 Asks Questions	15	6	11	18	56	4	14	17	6	14	12	11	13	13	33	34
5 Lectures	100	162	135	123	179	131	155	165	85	186	111	190	188	80	205	145
6 Gives Directions	128	172	65	108	148	169	141	130	82	101	171	239	194	60	273	157
7 Criticizes	4	0	4	0	2	5	6	1	1	0	32	3	1	4	2	0
8 Pupil(s) Talking	11	18	6	51	58	0	12	10	6	16	18	2	6	36	41	37
9 Inaudible	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M Monitors	322	271	232	124	137	93	120	287	412	170	203	188	141	248	67	132
D Demonstration	0	14	0	7	17	8	17	24	0	0	22	0	25	12	5	26
S Use of Stimuli	0	0	0	6	0	0	0	14	2	2	0	0	0	0	4	0
Lesson Time*	29:0	29:74	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:57	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	8	9

NS - Non-Specialist

S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 13

Frequency of Occurrence for the Teacher Location Dimension Categories
for Matched Pairs of Physical Education Specialist
and Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
P On The Perimeter	244	600	133	150	363	416	443	449	580	280	418	230	347	462	531	111
L Amongst The Children	419	78	357	332	264	24	67	209	47	242	222	436	266	9	145	461
X Absent From The Room	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesson Time*	29:0	29:47	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:57	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	8	9

NS - Non-Specialist
S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 14

Frequency of Occurrence for the Child Activity Dimension Categories for
Matched Pairs of Physical Education Specialist and
Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
A Majority "On Task"	211	87	119	158	152	127	47	204	0	34	43	87	275	0	195	228
B Average "On Task"	85	67	163	0	18	50	17	104	0	60	0	207	32	0	73	40
C Minimal "On Task"	16	299	25	76	84	40	175	65	433	112	266	94	41	332	58	13
D Demonstrating	161	0	46	6	18	15	0	6	0	50	0	111	4	36	29	36
O Organization	61	70	39	46	95	57	59	99	77	76	23	83	40	24	40	62
W "Off Task" Activity	133	160	98	196	260	151	212	180	117	190	308	184	211	79	301	193
Lesson Time*	29:0	29:47	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:51	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	9	8

NS - Non-Specialist

S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 15

Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Verbal and Non-Verbal Behaviour Dimension Categories for Matched Pairs of Physical Education Specialist and Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
1 Accepts Feelings	1.49	1.03	0.2	0.41	1.43	0.9	2.15	0.6	2.07	1.34	1.4	0.13	0.81	0.21	0.57	2.09
2 Praises And Encourages	8.54	3.09	2.44	5.18	0.47	5.9	3.33	2.27	2.87	4.02	7.81	3.00	5.87	2.75	4.16	3.14
3 Accepts Students Ideas	2.99	1.03	0.61	3.73	2.87	0.0	1.37	0.15	0.31	0.95	1.09	0.6	0.65	0.84	3.3	1.92
4 Asks Questions	2.24	0.88	2.24	3.73	8.93	0.9	2.74	1.06	0.95	2.68	1.87	1.65	2.12	2.76	4.74	5.94
5 Lectures	14.99	23.89	27.55	25.51	28.54	29.77	30.39	25.07	13.55	35.63	17.34	28.52	30.66	16.98	29.45	25.34
6 Gives Directions	19.19	25.36	17.55	22.4	23.6	38.40	27.64	19.75	13.07	19.34	26.71	35.88	31.64	12.73	39.22	27.66
7 Criticizes	0.59	0.0	0.81	0.0	0.31	1.13	1.17	0.15	0.15	0.0	5.00	0.45	0.16	0.84	0.28	0.0
8 Pupil(s) Talking	1.64	2.65	1.22	10.58	9.25	0.0	2.35	1.51	0.95	3.06	2.81	0.3	0.97	7.64	5.89	6.46
9 Inaudible	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M Monitoring	48.27	39.97	47.34	25.72	21.85	21.13	25.49	43.61	65.7	32.56	32.5	28.22	23.0	52.65	9.62	23.07
D Demonstration	0.0	2.06	0.0	1.45	2.71	1.81	3.3	3.64	0.0	0.0	3.43	0.0	4.07	2.54	0.71	4.54
S Use Of Stimuli	0.0	0.0	0.0	1.24	0.0	0.0	0.0	2.12	0.31	0.38	0.0	0.0	0.0	0.0	2.01	0.0
Lesson Time*	29:0	29:47	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:57	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	8	9

NS - Non-Specialist

S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 16

Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher Location Dimension
 Categories for Matched Pairs of Physical Education Specialist
 and Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
P On The Perimeter	35.58	88.49	27.14	31.12	57.09	94.55	86.86	68.23	92.5	53.63	65.31	34.53	56.6	98.08	77.72	19.40
L Amongst The Children	62.82	11.51	72.85	68.87	42.1	5.45	13.13	31.76	7.49	46.36	34.68	65.46	43.39	1.91	22.27	80.59
X Absent From The Room	0.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lesson Time*	29:0	29:47	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:57	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	8	9

NS - Non-Specialist

S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 17

Frequency of Occurrences in Percentage of Total Lesson Time for the Child Activity Dimension
Categories for Matched Pairs of Physical Education Specialist
and Non-Specialist Student Teachers

Categories	Matched Pairs (n=16)															
	NS1	S1	NS2	S2	NS3	S3	NS4	S4	NS5	S5	NS6	S6	NS7	S7	NS8	S8
A Majority "On Task"	31.63	12.09	24.23	32.78	24.24	28.56	9.21	31.00	0.0	6.51	6.71	13.06	44.06	0.0	28.01	39.86
B Average "On Task"	12.74	9.88	33.26	0.0	2.87	11.36	3.33	15.8	0.0	11.49	0.0	31.08	5.22	0.0	10.48	6.99
C Minimal "On Task"	2.39	44.1	5.1	15.76	13.39	0.09	34.31	9.07	69.05	21.45	41.56	14.11	8.31	70.48	8.33	2.27
D Demonstrating	24.13	0.0	9.38	1.24	2.87	3.41	0.0	0.91	0.0	9.57	0.0	1.65	0.65	7.64	4.16	6.29
O Organization	9.14	10.32	7.95	9.54	15.15	12.95	11.50	15.04	12.28	14.55	3.59	12.46	6.52	5.09	5.74	10.83
W "Off Task" Activity	19.94	23.59	20.0	40.65	41.46	34.31	41.56	27.35	18.66	36.39	48.12	27.62	34.42	16.77	43.24	33.74
Lesson Time*	29:0	29.:47	21:32	20:57	27:21	19:13	23:17	27:6	28:54	23:26	27:42	28:57	26:36	21:51	29:46	24:38
Rank**	4	5	7	1	10	16	12	2	11	6	13	14	3	15	8	9

NS - Non-Specialist

S - Specialist

* - Lesson Time in Minutes and Seconds

** - Teaching Effectiveness Rank on the 16 Point Scale

Table 18

Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher
Verbal and Non-Verbal Behavioural Dimension Categories for the Most
Effective and the Least Effective Student Teachers

Categories	Most Effective (n=4)				Least Effective (n=4)			
	1:S2	2:S4	3:NS7	4:NS1	16:S3	15:S7	14:S6	13:NS6
1 Accepts Feelings	0.41	0.6	0.81	1.49	0.9	0.21	0.13	1.4
2 Praises And Encourages	5.18	2.27	5.87	8.54	5.9	2.76	3.0	7.81
3 Accepts Student Ideas	3.73	0.15	0.65	2.99	0.0	0.84	0.6	1.09
4 Asks Questions	3.73	1.06	2.12	2.24	0.9	2.76	1.65	1.87
5 Lectures	25.51	25.07	30.66	14.99	29.77	16.98	28.52	17.34
6 Gives Directions	22.4	19.75	31.64	19.19	38.40	12.73	35.88	26.71
7 Criticizes	0.0	0.15	0.16	0.59	1.13	0.84	0.45	5.0
8 Pupil(s) Talking	10.58	1.51	0.97	1.64	0.0	7.64	0.3	2.81
9 Inaudible	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M Monitoring	25.72	43.61	23.0	48.27	21.13	52.65	28.22	32.5
D Demonstration	1.45	3.64	4.07	0.0	1.81	2.54	0.0	3.43
S Use of Stimuli	1.24	2.12	0.0	0.0	0.0	0.0	0.0	0.0
Lesson Time*	20:57	27:6	26:36	29:00	19:13	21:51	28:57	27:42

* Lesson Time in Minutes and Seconds

1:S2 = Rank Number 1, Subject - Specialist Number 2

13:NS6 = Rank Number 13, Subject - Non-Specialist Number 6

Table 19

Frequency of Occurrences in Percentage of Total Lesson Time for the Teacher
Location Dimension Categories for the Most Effective
and Least Effective Teachers

Categories	Most Effective (n=4)				Least Effective (n=4)			
	1:S2	2:S4	3:NS7	4:NS1	16:S3	15:S7	14:S6	13:NS6
P On The Perimeter	31.12	68.28	56.60	36.58	94.54	98.08	34.53	65.31
L Amongst The Children	68.87	31.76	43.39	62.86	5.45	1.91	65.46	34.68
X Absent From The Room	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lesson Time*	20:57	27:6	26:36	29:0	19:13	21:51	28:57	27:42

* Lesson Time in Minutes and Seconds

1:S2 = Rank Number 1, Subject - Specialist Number 2

13:NS6 = Rank Number 13, Subject - Non-Specialist Number 6

Table 20

Frequency of Occurrences in Percentage of Total Lesson Time for the Child
Activity Dimension Categories for the Most Effective
and Least Effective Student Teachers

Categories	Most Effective (n=4)				Least Effective (n=4)			
	1:S2	2:S4	3:NS7	4:NS1	16:S3	15:S7	14:S6	13:NS6
A Majority "On Task"	32.78	31.00	44.86	31.63	28.86	0.0	13.06	6.7
B Average "On Task"	0.0	15.8	5.22	12.74	11.36	0.0	31.08	0.0
C Minimum "On Task"	15.76	9.87	8.31	2.39	9.09	70.48	14.11	41.56
D Demonstrating	1.24	0.91	0.65	24.15	3.40	7.64	1.65	0.0
O Organization	9.54	15.04	6.52	9.14	12.95	5.09	12.46	3.59
W "Off Task" Activity	40.66	27.35	34.42	19.94	34.31	16.77	27.62	48.12
Lesson Time*	20:57	27.6	26:36	29:0	19:13	21:51	28:57	27:42

* - Lesson Time in Minutes and Seconds

1:S2 = Rank Number 1, Subject - Specialist Number 2

13:NS6 = Rank Number 13, Subject - Specialist Number 6

VITA

Surname: GRANT Given Names: BEVAN CHARLES

Place of Birth: OAMARU, NEW ZEALAND Date of Birth: JANUARY 10, 1948

Educational Institutions Attended, with Dates of Entering and Leaving:

DUNEDIN TEACHERS COLLEGE, DUNEDIN, NEW ZEALAND 1966 to 1968

UNIVERSITY OF VICTORIA, B.C. 1976 to 1977

UNIVERSITY OF VICTORIA, B.C. 1978 to 1979

Degrees, Diplomas, Etc., Awarded, with Dates and Names of Institutions:

TRAINED TEACHERS CERTIFICATE 1969 DUNEDIN TEACHERS COLLEGE, DUNEDIN

B.Ed. 1977 UNIVERSITY OF VICTORIA, B.C.

Honours and Awards:

Publications:

PARTIAL COPYRIGHT LICENSE

I hereby grant the right to lend my thesis or dissertation (the title of which is shown below) to users of the University of Victoria Library, and to make *single copies only* for such users or in response to a request from the library of any other university, or similar institution, on its behalf or for one of its users. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by me or a member of the University designated by me. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.


Title of Thesis

THE RELATIONSHIP BETWEEN SPECIALIST TEACHER TRAINING AND

EFFECTIVE PHYSICAL EDUCATION TEACHING IN THE ELEMENTARY

SCHOOL.

Author


BEVAN C. GRANT

NOVEMBER 1979