A DESCRIPTIVE-ANALYTICAL STUDY OF STUDENT TEACHER EFFECTIVENESS AND STUDENT BEHAVIOUR IN SECONDARY SCHOOL PHYSICAL EDUCATION

by

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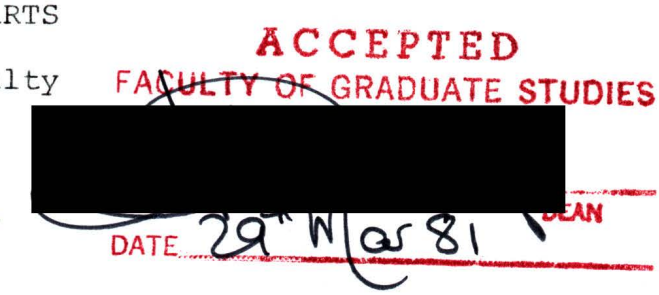

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ABSTRACT

This study was a descriptive-analytical investigation of student behaviour and its relationship to student teacher effectiveness in secondary school physical education classes. Four basketball lessons, five dance lessons, and seven indoor soccer lessons were video-taped. Sixty-five students, with a minimum of three and a maximum of five from each class, were randomly selected for observation. Each was individually observed and coded every 12 seconds, for three five-minute periods of the lesson, using the ALT-PE Model (Siedentop, Birdwell, and Metzler, 1979) as the coding instrument. ALT-PE and ALT-PE(M) were determined for each student, each class, and each activity.

The 16 lessons were evaluated and scored independently for teacher effectiveness by three competent and experienced physical educators using an evaluation sheet designed for the study. A quarter of the tapes were scored a second time by the judges and a reliability of .75 obtained.

Twenty-six t tests were completed to determine (1) the relationships between student 'time on task' and: basketball dance, and indoor soccer activites; class size; and sex of student teacher; (2) the relationships between teacher

effectiveness, as scored by the judges, and: basketball, dance, and indoor soccer lessons; class size; and sex of student teacher; and (3) the relationship of student 'time on task' in the four most effective and four least effective lessons.

The results showed significant differences in student 'time on task' for different activities taught, but no significant differences for class size or sex of the student teacher. No significant differences were found for teacher effectiveness between activities taught, class sizes, or sex of the student teachers. A great variability was found in student 'time on task' for the least effective lessons. This was due to the high student involvement in fitness activities in dance classes that the judges considered to be ineffective physical education lessons.

The study supported the claim by Brophy and Evertson (1976) that teaching was the application of a variety of skills at different times under various circumstances.

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CHAPTER I

INTRODUCTION

Teaching has been regarded as the orchestration of a variety of skills at different times under different circumstances (Brophy and Evertson, 1976). Effective teaching is the application of this principle. Educational researchers have attempted over the last 70 years to discover the particular variables involved in attaining successful student outcomes in terms of attitudes and achievements. To date one of the few major experimental studies on teacher effectiveness (Gage, 1976) did not reach any definite conclusions about teacher behaviours and student outcomes.

From numerous correlational studies, tentative conclusions have been drawn that suggest no one teaching behaviour is responsible for improved student outcomes, but a number of variables have been consistently and significantly related with student outcomes. Of these variables 'time on task,' in terms of student time engaged on tasks relating to the objective of the lesson, has been regarded as one of the most consistent and most significant correlators with student outcomes (Rosenshine and Berliner, 1978).

Good research on teaching involves the investigator in collecting data in the real classroom setting to which he intends to generalize his results (Brophy, 1976). He is then in a position to analyze the processes of teaching and the consequent outcomes in terms of student behaviour to formulate a theory of teaching. Research has shown this to be a difficult though not impossible task (Evertson and Brophy, 1974; Rosenshine and Berliner, 1978).

Research of this nature in physical education is, as yet, in its infancy (Locke, 1979). While the process-product strategy outlined above has been successful for research in regular classroom situations, it is not a useful model for physical educators to follow (Siedentop, Birdwell, and Metzler, 1979). The main problem is pupils in physical education classes produce few 'permanent' products compared with what the classroom teacher regularly collects with, for example, spelling tests and mathematics tests. Consequently, it is difficult to find valid and reliable measures of student achievement in physical education. Procedures that are valid and reliable measures of student performance in motor skills are practically non-existent (Locke, 1977).

Some strategy, however, was needed to enable physical educationists to make judgements about teacher effectiveness without the relevant data on student outcomes. A group

of studies, under the guidance of Dr. Daryl Siedentop at the Ohio State University, were conducted, based on the premise that the variable 'time on task' was related to student outcomes and so to teacher effectiveness. The theory being that 'time on task' is the mediating link between the behaviour of the teacher and student achievement (Siedentop, Birdwell, and Metzler, 1979). This assumption has been based mainly on the findings of the Beginning Teacher Evaluation Project (Marliave, Fisher, and Dishaw, 1977) and the Juniper Gardens Study (Hall, Delgradri and Harris, 1977). The research was of a descriptive, analytical nature. Without valid and reliable measurements of motor skills performance, it is difficult to support or falsify these hypotheses. Because of its important implications for physical education teaching, some attempt must be made to examine their findings by conducting more research.

This study describes the process of teaching in physical education classes. The behaviours of the students and the student teachers were coded to discover the percentage of student 'time on task' in basketball, dance, and indoor soccer classes. Highly qualified educationists independently scored the lessons, for the teachers' effectiveness in attempting to fulfill the stated objectives of the lessons. The data were analyzed to determine the relationship between student 'time on task' and the effectiveness levels of the student teachers. The data were re-analyzed to discover

whether the specific physical activities taught, class size, and sex of the teacher were factors contributing to increased or decreased student 'time on task.' A final analysis of the data was done to discover whether student teachers found it easier, and therefore more effective, teaching a particular physical activity to a particular class.

If problem areas in the teaching of physical education can be recognized, educators of student physical education teachers can begin to design their undergraduate programmes in terms of fulfilling those needs. Secondly, if it can be shown that specific physical activities call for greater organizational planning of lessons to provide for optimum student 'time on task' then teachers, having been made aware of this, will be more conscious of it when planning their lessons in that activity.

Statement of the Problem

The purpose of this study was fourfold:

1. To describe student behaviour in basketball, dance, and indoor soccer lessons.
2. To examine the effect of these activities, class size, and sex of the student teachers on the amount of student 'time on task.'
3. To analyze the relationships between the different physical activities, class size, and sex of student

teachers with regard to the effectiveness of the student teachers to fulfill the stated lesson objectives.

4. To examine the relationship between student teacher effectiveness, as scored by the judges, and student 'time on task'.

Definition of Terms

Student Teachers. Student teachers who were in their fifth and final year of a Bahcelor of Education degree programme at the School of Physical Education, University of Victoria, and as part of their training were required to teach in a practicum teaching situation in secondary schools on Vancouver Island and Southern British Columbia in the Spring of 1980.

ALT-PE Model. The Academic Learning Time-Physical Education observation instrument that was used to code the behaviours of the pupils during their physical education lesson.

Behaviours. When a specific behaviour category of the observation instrument is referred to, the meaning is that outlined by the Ohio State University (O.S.U.) ALT-PE model. See Appendix A.

Time on Task. This has been defined as the amount of time the student was coded in a Content-PE cateogry and at a high success level in any of the three engaged learner moves dimensions in the ALT-PE observation model. Success

level means that few errors were made by the pupil while executing appropriate behaviour. Appropriate behaviour referred to the students' involvement in either cognitive or motor tasks that pertained to the fulfillment of the lesson objectives. Time on task is the general term for student behaviour referred to as ALT-PE and ALT-PE(M) in this study.

ALT-PE. This was the amount of Academic Learning Time accrued by a student while in a physical education class.

ALT-PE(M). This was the amount of ALT-PE accrued by a student while directly engaged in motor skill tasks only.

Observer. The individual whose task it was to analyze and code the 16 video-taped lessons using the ALT-PE observation instrument (Siedentop, Birdwell, and Metzler, 1979).

Effectiveness. The average score of three judges who, independently, evaluated and scored the 16 tapes on a 50-point scale, using an evaluation sheet specifically designed for that purpose. See Appendix B.

Class Size. A large class refers to 23 or more students and a small class refers to 22 or fewer students. There was no evidence in the literature to suggest an appropriate 'break point'. The 'break point' was decided after reviewing the size of some physical education classes in British Columbia.

Delimitations

The following were the delimitations of this study:

1. Student teachers were confined to student teachers at the University of Victoria who were in their fifth year of a Bachelor of Education programme, and majoring in physical education.
2. The floor space available for teaching purposes was limited to the area viewed through the camera lens. The quantity and quality of equipment available to the student teacher was not controlled.
3. The length of the lessons was confined to between 25 minutes and 30 minutes duration.
4. Each student teacher taught one lesson in either basketball, dance, or indoor soccer.
5. The behavioural categories observed were confined to those outlined in the O.S.U. ALT-PE observation instrument.
6. In coding student behaviour, 20 per cent of the students from each class were randomly selected, and their behaviour analyzed, as a representative sample of the class populations. Each of the students was observed for three five-minute periods of the lesson; one observation period at the beginning, the middle, and the end of the lesson.

7. The students' behaviours were observed for six seconds and coded for the next six seconds throughout a 15-minute period of the lesson.

Limitations

The following were the limitations of the study:

1. The researcher's ability to ensure minimal interference with the teaching situation while filming the lessons.
2. The coder's ability to interprete student teacher and student behaviour and code it reliably.
3. Previous experience of the pupils in the particular skills taught in the lesson was a variable that was not controlled. Such a confounding variable may have influenced the effectiveness of the teacher.
4. The study's findings can only be generalized to the student teachers teaching basketball, dance, and indoor soccer, but should be of interest and importance to all physical educators especially those involved in training programmes for physical education student teachers.

CHAPTER II

REVIEW OF RELATED LITERATURE

To put this problem in context, a review of literature was undertaken which dealt with areas relating directly to the topic and other areas which were considered relevant to an understanding of the topic. To discuss this literature, the chapter has been divided into six sections. They are: (1) concept of teaching; (2) concept of learning; (3) methods of studying teaching; (4) research on teaching; (5) research on teaching physical education; and (6) findings in physical education research dealing with 'time on task' and teacher experience. The studies dealing with research in sections four,five,and six above have been delimited to what Locke (1977:10) referred to as "only studies which employ data gathered through direct or indirect observational activity."

Concept of Teaching

Do teachers make a difference? Not all educational researchers agree that they do. A study by Popham (1971) found that teachers did not outperform non-teachers in promoting learning attainment of prespecified instructional

objectives. In a similar investigation, Stephens (1967) concluded that the major forces that cause a pupil to succeed lie within the pupil. Dembo and Jennings (1973) found that, while the teachers did not outperform non-teachers on measures of student achievements, there was a difference between teachers and non-teachers on measures of student attitudes to education. Glass (1972) disagreed with Popham's (1971) findings claiming that the teachers did not know the students they were teaching and could not therefore put their expertise on teaching into practice. He also criticized the brevity of the study.

Reviewing the literature on teaching, the vast majority of researchers do credit teachers with having an effect on student outcomes (Green *et al.*, 1966; Good, Biddle, and Brophy, 1975; Rosenshine, 1971; and Rosenshine and Furst, 1971 and 1973). Agreeing that teachers do make a difference, a definition of teaching needs to be outlined. A concept of teaching is necessary to establish the criteria of effective teaching. Is it possible to study teaching? Hughes (1963) outlined in Bellack's (1963) *Theory and Research in Teaching* that teaching can be classified as, (1) an occupation; (2) a cluster of activities; and (3) the act of teaching. Can this act of teaching, outlined by Hughes (1963), be studied systematically? Highet (1954) regarded teaching as an act which could not be systemat-

ically appraised. Gage (1963) developed the argument further by stating that, while teaching may be regarded as an art, within art there is an inherent order and lawfulness. Gallagher (1970) was of the opinion that teaching was regarded as too much of an art and those interested in improving teaching would like to remove some of the mystery of the art through systematic study. B.O. Smith (1960) defined teaching in a scientific way as "a system of actions intended to induce learning." Eisner and Elliot (1964:119) defined it as "what occurs when teachers, by virtue of their instructional activities, succeed wholly or in part in enabling pupils to learn." There is a distinction here between the process and the product of teaching. The difference is one of intention or success in bringing about learning. For the purpose of this study, the definition of teaching by Smith (1960) was accepted and through systematic study of teaching it is hoped to bring the first definition to include the second definition.

Concept of Learning

What is learning? It has been defined by Bigge (1964:1) as:

> a change in a living individual which is not heralded by his genetic inheritance. It may be a change in insights, behaviour perception or motivation, or a combination of these.

Teaching then, is involved with changing behaviour, or behavioural modification as defined by psychologists. For behavioristic psychologists, the principal assumption is that behavioural change is brought about by rewarding the kind of behaviour one wants to encourage and ignoring the kind one wants to discourage (Skinner, 1968). Physical educationists are involved mainly in the teaching of motor skills.

Cratty (1964:215) defined motor learning as "a stable change in the level of skill as a result of repeated trials." Therefore 'time on task' is needed by the pupil in order that he/she can attain the objective of learning a motor skill. Rarick (1974) stressed the importance of motivation as well as practice. He defined learning as a "change in behaviour or improvement in performance coming directly as a result of practice in which there is the intent to learn" (Rarick, 1974:2). One of the teacher's priorities in a physical education lesson must then be to ensure that sufficient 'time on task' is allowed for motor learning to occur.

Gentile (1972) outlined the role of the teacher as facilitating skill acquisition through creating a specific environmental problem, establishing an adequate motivational level, providing supplementary visual input (e.g., demonstrations), directing movement or positioning the student,

structuring the environment under which the task is performed, and allowing sufficient time to practise the motor skill.

Ruth Skinner (1972) conducted a study of seventh grade boys in a New York School to investigate the effect practice had on the learning of a motor skill. After 25 trials the group was divided into three groups by skill level. The findings showed that only the high skill level group exhibited a marked improvement during the trials (n = 50) and this occurred in the last block of ten trials. The high skill level group seemed to stabilize on a particular movement pattern much earlier in the practice session. In her conclusions, Skinner (1972:37) stated that "once again we are reminded that the acquisition of skill takes time, particularly for the slow learner." Lawther (1968) stated that demonstration followed by attempted imitation and trial and error are the procedures most effective for use with the beginner. Novices, he argued, must get the idea of what to do, then have the opportunity to try it out.

Methods of Studying Teaching

Study of the process of teaching can reveal whether the pupil is given the opportunity to spend adequate 'time on task.' Research on teaching has not yet been able to

establish how much time is sufficient for different students. This Berliner (1977) saw as a "strong research need." The best place to study teaching is in a naturalistic setting (Davitz and Davitz, 1975). Davitz and Davitz (1975) defined a naturalistic setting as a:

> . . . strategy of research in which the investigator observes what happens in the natural world as systematically and as objectively as he can.

It has been described by Herbert and Attridge (1975) as "the observation of subjects in natural or manipulated settings." The advantage of such a system, according to Dunkin, is that it involves the reality of the situation where theories of teaching and teaching effectiveness can be analyzed (Dunkin and Biddle, 1974). The tools of naturalistic observation are rating scales of teacher effectiveness and descriptive observation systems that describe the teaching learning process. Such descriptive observation systems, are now very popular in educational research as they offer greater low inference specificity and an objective count of teacher and student behaviours (Rosenshine, 1970). Such instruments are potentially the most useful techniques for collecting data in the teaching situation and have formed the most rapidly growing set of tools now available to the researcher (Herbert and Attridge, 1975). There has, however, been very little

study of the most efficient methods of using such systems.

Three broad categories of 'observation systems' have been defined by Rosenshine and Furst (1973):

1. A sign system. This is the recording of one event within a specified time period, for example, Flanders' Interaction Analysis System (Flanders, 1970).
2. A category system. This is the recording of events or behaviours as they occur, for example, Bales' Interaction Process Analysis System (Bales, 1950).
3. A rating system. This is the rating of behaviour on a predetermined scale using previously defined criteria.

Within each of the above systems, high and/or low inference traits may be found, depending on the system and the purpose for which it was developed.

This review is concerned with the first two categories. Both sign and category systems utilize carefully predefined categories of behaviour, which form a set of mutually exclusive categories that attempt to encompass all classroom behaviour. The difference between a category and a sign system is that the former records behaviour as it occurs; the observer tallying instances of each discrete event as each is observed (Locke, 1978). The latter,using a sign system, where the period of

observation is divided into nine intervals and the observer codes the behaviour that best represents the behaviour of the pupil for each interval. The length of the behaviour is the main criterion used in this coding procedure.

Such observation systems do have a number of disadvantages. The problems are concerned with validity of the instruments and reliability of the observers using them. Reliability refers to inter- and intra-observer reliability. Other problems, such as bias on the part of the observer and the effects of the observer's presence on the subjects must also be considered (Johnson and Bolstad, 1967). Perhaps the major problem with observation instruments and their usefulness is the problem of internal and external validity. The systems must be examined for the degree to which the desired behaviours can be observed; whether clear and precise definitions of each behaviour are outlined; and finally, whether the various systems are able to account for all behaviours under observation at a particular time. Rosenshine and Furst (1973:161) made the point that:

> . . . although an observation category system may provide neutral, objective descriptions of classroom transactions, the people who interpret the data usually make judgements about effective teaching. At present the judgements can only be guesses about what is good, true, and beautiful in classrooms.

When studies using these various observation systems are reviewed, generalizability is extremely limited from study to study because of, what Shavelson (1976) referred to as, the lack of systematic variation in situational and observational facets and the lack of standardization of measurement. He criticized investigations done to date as being methodologically inadequate to resolve the issue of what behaviours could be related to pupil outcomes. He considered the findings on generalizability and stability of measures of teacher behaviour were equivocal with only a few exceptions. For future studies, he proposed a systematic effort be made to resolve the measurement issue (Shavelson, 1976).

Research on Teaching

Aware of the difficulties that researchers have had in the study of teaching, it is relevant at this point to review some studies of research on teaching in general education where 'time on task' was one of the variables considered. These studies were of three main types (Rosenshine, 1973). Some dealt with the development of a system and its use as a descriptive tool to quantify behaviour (Flanders, 1950 and 1970; Bales, 1950; Medley, 1962). Up to 1970, approximately 100 observation systems had been identified, 76 of which were for use in classroom obser-

vation studies (Simon and Boyer, 1970). A second group of studies utilized these observation systems in correlational investigations where the relationships of chosen variables to student outcomes were examined (Berliner, 1976; Soar, 1973; McDonald, 1976; Stallings, 1976). The third category was of studies of an experimental nature where the significant variables obtained in valid and reliable correlational studies were retested in a more controlled manner. In experimental studies, the researcher measures the effect of the manipulation of independent variables on dependent variables (Davitz and Davitz, 1977). The one major study in this category on teaching effectiveness was the Stanford Program on Teacher Effectiveness (Gage, 1976). Researchers to date have concentrated most of their efforts on studies of a correlational nature.

What, then makes a good teacher? Attempts to answer this question began as early as 1896 (Medley, 1973). This review is limited to some of the more relevant studies carried out since 1946, when the first attempt was made by Barr (1946) to use measurable pupil changes as the criterion of teaching ability, in addition to ratings of effectiveness by administrators. Medley (1972) concluded, from his review of the literature, that a study of research prior to 1957 would not further our knowledge of teacher effectiveness; Flanders (1950) and Bales (1950) being the

main exceptions to this generalization.

The major reviews of literature in the area of research on teaching have been done by Biddle, Dunkin, Furst, and Rosenshine. Rosenshine and Furst (1973) were of the opinion that all the findings could be regarded as inconsistent and inconclusive. Dunkin and Biddle (1974: 148) referred to the findings as "suggestive" of further research. No one behaviour, they argued, had been found that, when used, brought about an effective teaching situation. Brophy (1976) contended that "teaching involves the orchestration of a large number of variables that must be present at a given point in time."

In *Teacher Behaviour and Student Outcomes*, Rosenshine (1971) reviewed 51 studies of teacher behaviours and student outcomes. He found six teacher behaviours which were the most consistent correlators with student achievements. They were: (1) teachers' approval/disapproval; (2) teachers' cognitive behaviours; (3) flexibility and variety; (4) enthusiasm; (5) amount of teacher-student interaction; and (6) time. In a later review Rosenshine and Furst (1971) listed 11 variables that were consistently related to pupil outcomes across subject matter, social class, and grade level. They included the six variables that Rosenshine (1971) had outlined, as well as: (1) clarity; (2) student opportunity to learn;

(3) types of questions asked by the teacher; (4) level of difficulty of instruction; and (5) probing.

In 1973, Rosenshine and Furst reviewed the studies again, grouping them under different headings and outlined what they termed the 'Big Nine' variables. They found that these nine variables yielded the most significant and/or consistent results. The variables outlined were: (1) clarity; (2) variability; (3) enthusiasm; (4) task oriented/ business like; (5) criticism; (6) teacher indirectness; (7) student opportunity to learn criterion material; (8) use of structuring comments; and (9) multiple levels of questions or cognitive discourse.

A very comprehensive review, of investigations using classroom observation techniques, was done by Dunkin and Biddle (1974). They reviewed 178 studies of a process-product nature and agreed with Rosenshine's and Furst's conclusions in that they refer to their findings as "suggestive." They tended to agree with Brophy (1976) that teaching is the orchestration of a large number of variables. Three of these studies require closer examination of their findings in regard to the variable 'time on task.'

This was found to be a variable that was consistent and positively related to student outcomes. While the definitions of 'time,' 'student opportunity to learn,' and

'task oriented' differed slightly in different investigations, they all dealt with that aspect of behaviour that had the student engaged on tasks.

The three main studies relevant to this investigation are the Beginning Teacher Evaluation Study at the Far West Laboratory, the Juniper Gardens study, and the Texas Teacher Effectiveness Program. The Beginning Teacher Evaluation Study was an ethnographic study, with 40 'sites' (teachers and their classes) selected from 200 volunteers, to teach two-month experimental teaching units (E.T.U.'s) on reading and mathematics. The ten most effective and least effective teachers were determined using residual gain scores. Protocols were drawn up for reading and mathematics and summary information regarding the teacher and the school situation was collected for four weeks. At the end of this period of observation, 61 behaviour dimensions were outlined. Of this number, 21 variables were found to be generic in that they discriminated between the more and less effective teachers (Berliner, 1976). One of the major findings was that 'time on task' or, as Berliner (1976) referred to it, "academic engaged time," was consistently associated with the more effective teachers. The final report by Marliave, Fisher, and Dishaw (1977:122) stated that:

> The positive effects of engaged time and percent easy, as well as the negative effects of percent hard were shown to account for substantial proportions of variance in student learning of reading and mathematics at the second and fifth grades. That is, students learned more when they spent more time engaged in academic tasks where they made relatively few errors.

The Juniper Gardens Study (Hall, 1977) looked at student opportunity to learn as a motivational factor in special and regular classrooms. Hall concluded that, with a minimal level of proficiency in performing the academic tasks outlined by the teacher, the student seemed to profit from the increased time spent in study. When the teachers assigned study tasks within the ability of the pupils, correlated gains in academic achievement were noted (Hall, 1977). It was apparent from the literature that it is not enough for the pupil to spend time on a task, he must be able to cope with that task. As Berliner (1976) defined it, the pupil's error rate must be low for significant learner outcomes to appear.

A third study that supported 'time on task' as an important variable was the Texas Teacher Effectiveness Study (Brophy and Evertson, 1976). This two-year investigation used the Dyadic Interaction System developed by Good (Brophy and Good, 1974) plus some high inference coding instruments. In the findings after the first year the students involved on tasks at very low error rates had a

negative correlation with learning gains (Evertson and Brophy, 1974). In the final report, 17 variables were listed of which only seven were positively related to pupil achievement across all socio-economic levels. One of these variables was 'keeping students actively engaged' (Brophy and Evertson, 1976). This variable was one of the most consistent across socio-economic status and age levels.

Rosenshine and Berliner (1978), in a review of recent studies, found that in most of the studies, 'content covered' and 'student opportunity to learn' showed significant relationships with student achievement. The main problem associated with engaged time was the difficulty in coding and/or measuring attention or engagement. Despite this, however, Bloom (1976) found that the correlation between student attention and student gain was .40 if the class was the unit of analysis. If individual student scores were used, the correlation was .52. In his review, Berliner (1978:12) concluded that:

> . . . the effective classroom teaching of basic skills takes place in an environment characterized by an emphasis on academic achievement . . . . Teachers that make a difference in student achievement are those, who put students in contact with curriculum materials and find ways to keep them in contact.

He went on to relate his findings to the 11 variables already outlined by Rosenshine and Furst (1971) and concluded that

the two variables, 'task orientation' and 'content covered' have had the most substantial consistency in subsequent research with 'academic engaged minutes' emerging as a reasonable proxy for 'content covered' (Berliner and Rosenshine, 1978).

Berliner's findings were supported by McDonald (1976) who found that teachers' performances which increased direct instructional time in a subject matter tended to be associated with greater student achievement gains in different subjects and across different grade levels. Stallings and Kaskowitz (1974) did a study on the academic learning time of students involved in reading and mathematics. They found that the amount of learning time allowed received higher correlates with student behaviour. Other investigations that supported such findings were Shutes (1969), Armento (1977), Powell (1978), and Good (1979).

From this review of the relevant literature, it is reasonable to put forward the idea that the variable 'time on task' is a characteristic of effective teaching in the classroom situation. The next section reviews research on teaching physical education to discover if any similar findings exist.

Research on Teaching Physical Education

The research already done in physical education is not of a very high quality. The title of an article by Locke (1977), "Research on Teaching Physical Education: New Hope for a Dismal Science" gives a general overview of the state of the discipline with regard to the quality of the research. Taking 1970 as the baseline which Locke suggested, only ten per cent of all research in physical education was concerned with the teaching of motor skills (Locke, 1977). Of this ten per cent, much is either invalid or unreliable. The most common methodological problem in the investigations has been an inadequate definition of experimental treatments, inadequate control over their application, and their inability to measure what was being studied. The main faults have been short periods of treatment, inadequate sample size for what was being measured, and an overemphasis in the studies on the female subject (Locke, 1977).

The only area where there is a glimmer of hope is in the development and application of observation systems to study physical education (Locke, 1977). While such research is still in its infancy (Nixon and Locke, 1973), such naturalistic observation of physical education lessons is perhaps one of the most revolutionary phases ever in the physical education profession (Locke, 1977).

The first study in physical education that used a systematic observation system was done by Bookhout(1967). She used Medley's and Mitzel's observation schedule (Medley, 1962) in an examination of the socio-emotional climate in physical education classes. The first system designed specifically to analyze physical education classes was developed by Barrett. It described teacher and student behaviour in movement education and had four dimensions under which behaviour could be analyzed: movement, content, guidance, and student responses (Barrett, 1969).Barrett concluded that such a system showed promise but needed to be refined. The third study, carried out by Dougherty (1970), used a modified version of Flanders' interaction process analysis system to evaluate the effectiveness of different teaching styles, previously outlined by Mosston (1966).

The use of such systems was seen by Anderson (1971:2) as a reaction to the major inadequacies of past experience. He stated such systems contributed to a "better understanding of what actually happens in real world settings, where teachers and students interact." Locke (1973) further supported this point by stating that observation systems go right to "the core of teaching," what he referred to as "the moment to moment events in the gym." Observational analysis does not attempt to identify good and bad teaching,

but focusses on the rather modest goal of accurately describing real world events in the classroom (Anderson, 1971). Cheffers (1972) not only agreed but stated that the kind of study that existed in physical education research was limited because of the inability of the observation systems to deal with the non-verbal aspect of the class situation which he believed was vitally important. Cheffers designed his own system to discriminate between verbal and non-verbal behaviour (Cheffers, 1972). It was an adaptation and extension of Flanders' interaction analysis system (Flanders, 1970).

Cheffers (1978) outlined eight reasons why systematic observation systems should be used in physical education research. They are as follows:

1. to describe current classroom practice;
2. to modify teacher behaviour;
3. to provide a tool for the analysis of teaching;
4. to give feedback about one's own teaching;
5. to train student teachers;
6. to discriminate between patterns of teaching;
7. to determine the relationship between various classroom behaviours and pupil outcomes; and
8. to help in projecting future teaching patterns.

In reviewing the investigations on teaching physical education, it was found that they fitted one or more of the above categories. The first system, as stated above, was designed by Barrett (1969). Since then a plethora of systems have been developed by, for example, Anderson (1974), Fishman (1974), Cheffers (1972), Lauback (1975), and Siedentop and Hughley (1975). These systems describe the behaviours of teachers and students in their classrooms. Some systems have dealt only with analyzing teacher behaviours (Anderson, 1974; Lewis, 1977; Taylor, 1978); some analyzed student behaviour only (Young, 1973; Lauback, 1974; Siedentop and Hughley, 1975); others have looked at the pedagogic functions of the physical education teacher (Morgenegg, 1974); while others have described the use of feedback in the physical education class (Fishman, 1974; Tobey, 1974).

Findings in Physical Education Research on Teaching

This section reviews the relevant physical education literature that has dealt with the variables 'time on task' and its relationships to class size, teacher experience, and type of physical activity. Some few findings can be said to relate to these areas but it is obvious that a great deal of research into this area is needed.

Keeping in mind that 'time on task' meant slightly different things in different studies, some generalizations are possible about the findings. 'Time on task' for Siedentop, Birdwell, and Metzler (1979) was time spent by the pupil in low error rate tasks directly related to the objectives outlined for the lesson. 'Time,' for Lauback (1974) was time engaged in movement tasks that were directly related to accomplishing the physical education objectives for a lesson. There was no qualitative aspect involved in this category.

To allow 'time on task' during the class period, certain things must be accomplished by the teacher. To obtain maximum 'time on task', time spent organizing the students and the equipment to be used during the lesson, must be kept to a minimum. This, however, has not been shown to be the case by Stewart (1977), Freedman (1978), and Quarterman (1977). Freedman (1978) found that while graduate teachers spent more time on class management than student teachers, their pupils spent an equal amount of 'time on task' in physical education classes. Stewart (1977) discovered that female physical education teachers and teachers not holding a graduate degree spent more time managing their classes than any other classification groups. Quarterman (1978) found that full-time teachers in mid-Missouri spent 34 per cent of their class time in management, with only

just over 54 per cent of the pupils' time devoted to actual participation in activities related to the class objectives.

Costello (1977) applied Lauback's system to the video data bank collected at Teachers College during the period 1971 to 1974 and found pupils spent almost two-thirds of the total time they were observed either waiting or listening to the teacher. In contrast, pupils were engaged in motor activities for less than one-third of the total time observed. They spent 15.3 per cent of their time practising motor skills and 10.3 per cent gameplaying. They engaged in exercise 3.6 per cent of the time but hardly ever (0.2 per cent) engaged in exploring behaviours. If, as many psychologists and physical educators suggest, time to obtain repeated trials at practising a motor skill is necessary to produce learning (Gentile, 1972; Skinner, 1972), then teaching methodology in physical education needs to be re-evaluated in the light of such findings. Given Cratty's (1964:215) definition of learning as "a stable change in the level of skill as the result of repeated trials" and given the results of Gentiles (1972) and Skinners (1972) investigations, a definite need exists to examine whether physical education classes provide sufficient 'time on task' for the pupil to learn a variety of motor skills. The few studies done to date have concentrated on elementary schools while most of the specialist physical

education teachers teach in secondary schools. There is an obvious need for research in this area.

In reviewing the literature, only four studies were found that dealt with the variable 'teacher experience' and only one related it to 'time on task.' Stewart (1977) discovered that more experienced physical education teachers engaged in positive teacher behaviour more than the less experienced physical education teachers. A study by Tobey (1974) examined the effect of teacher experience in the teachers' use of augmented feedback in physical education lessons. One of his findings showed that experienced teachers gave more feedback than new teachers. Their feedback was also more specific to the task the student was engaged in than the general feedback given by the less experienced teachers. Quarterman (1978) found that the most experienced teachers used the highest rates of student instructional modeling and the highest rates of 'nagging' reactions.

In relating teacher experience to student 'time on task' Freedman (1978) discovered that student teachers and graduate teachers had an equal amount of activity time. They were alike also in that they reprimanded or 'nagged' the pupils, more than they praised them.

Only one study has considered, even indirectly, the relationship between 'time on task' and different

physical activities (Quarterman, 1978). Quarterman analyzed the percentage of pupils actively engaged in physical activity. In 24 classes, he found that only 35 per cent of the students were always actively involved. It varied according to the activity taught, with 86 per cent of the pupils always involved in rhythmic activities and only three per cent involvement in trampolining.

In relating 'time on task' to class size, Lauback (1975) found that students in small classes spent more time 'waiting' while students in large classes spent more time in the combined functions of 'practice', 'gameplaying', and 'exercise'. She concluded from this that,perhaps, as a result of experience, teachers of large classes had learnt to organize their pupils more efficiently and get them involved in substantive activity more quickly than teachers of small classes.

Perhaps,a more important, but more difficult, problem is the question of how much 'time on task' is sufficient time for a particular individual to learn a specific skill. This kind of investigation cannot be carried out until such time as valid and reliable measures of motor skill learning have been established.

This particular study describes the present situation in physical education classes, analyzing whether certain physical activities lend themselves to increased student

activity in physical education classes,and examining whether class size has any effect on pupil 'time on task'. In the studies reviewed above, for example, Freedman (1978) and Tobey (1974), the variables, class size and activity taught, were not controlled which has been done in this study. The next chapter deals with the design chosen to answer the questions posed in Chapter I. It outlines the procedures followed to recruit subjects, video-tape the lessons, and the methods used in analyzing the tapes.

CHAPTER III

RESEARCH METHODS

The research design chosen to investigate the problem, as previously outlined, utilized the naturalistic method of observation. This method of observation has been described by Davitz and Davitz (1977:46) as:

> . . . a strategy of research in which the investigator observes what happens in the natural world as systematically and objectively as possible.

Locke (1977:11) considered it as the only method of gaining a disciplined body of knowledge about the instructional process of physical education. Brophy (1976) was convinced that the complexities of 'classroom' life could only be profitably investigated in real world settings. Research on teaching should be conducted in settings to which the investigator wishes to generalize his results. This, according to Brophy (1976), means frequently using unorthodox designs and sacrificing experimental control for the sake of generalizability.

Subjects

Eight male and eight female physical education student teachers, in their fifth year at the University of Victoria, B.C., Canada, were video-taped teaching physical education lessons in the schools to which they had been assigned for their spring practica, 1980.

The Lesson

The student teachers were each asked to teach a lesson of at least 25 minutes and not more than 30 minutes in duration. The objectives for each teacher's lesson had to be stated by the student teacher beforehand.

The lesson was taught to either an all boys' class, an all girls' class, or a co-educational class. The equipment used, the style of teaching used and the organization and management of the class was entirely at the discretion of the student teacher. All pupils were required to wear a standard set of numbered bibs for identification in the later analysis.

The choice of activity taught by the student teacher was limited to any of three activities: basketball, dance, or indoor soccer. The objective was to have 16 student teachers each teach a lesson in either basketball, dance or indoor soccer. Because of the male student teachers'

reluctance to teach dance, they chose basketball and indoor soccer while the female student teachers taught dance or indoor soccer. Because of ongoing programmes in the schools, it was not possible to randomly assign each student teacher to teach a particular activity.

Eight student teachers taught junior classes while the other eight taught senior classes. Seven of the classes were large classes; the largest class having 28 students. There were nine small classes; the smallest class having 11 students. The composition of the classes varied; eight classes had female students only, three classes had male students only, and the remaining five were co-educational classes. For a description of each class see Appendix C.

Video-taping

Each lesson was video-taped by the researcher and a graduate student colleague. The equipment used was a video-tape recorder (VTR), a monitor, a studio camera with wide-angle lens attached, and a tripod to fix the camera in place for the entire lesson. A cordless microphone to record the voice was clipped on to the student teacher's tracksuit top, with a four by two inch battery clipped on to the pants of the tracksuit; causing a minimum of interference in the teacher's mobility.

Placement of the camera to film the lesson depended on the nature of the facility. If a stage was available then the camera was placed in a back corner of the stage to obtain maximum floor space for teacher and pupils to work. If a stage was not available,the camera was strategically placed in a corner of the gymnasium where the optimum floor space of the gymnasium could be viewed through the camera lens. The restrictions on floor space during the lessons were based, entirely, on how much space could be viewed through the camera lens. The tapes used were 30 minutes and 60 minutes, eight millimetre reel to reel black and white video-tapes.

Prior to filming the lessons, permission was sought from the school districts' superintendents for access to the schools. Secondly, the principals' permission was sought to allow the filming of the activities at their schools. Thirdly the co-operation of the student teachers was sought to teach a lesson in either basketball, dance, or indoor soccer. The student teachers were each notified of the camera persons' arrival at their school for filming,at least one week in advance. They chose which class was to be filmed. Before the lessons began, the students were told what was happening and were asked to try and disregard, as much as possible, the presence of the camera and the camera persons. During the filming, an attempt was made by the camera persons to remain as inconspicuous as possible.

The Observation Instrument

A major criticism of research on teaching has been the plethora of systems developed to study the teaching process (Locke, 1974; Siedentop, 1979). Dunkin and Biddle (1974:425) called for "a moratorium on the development of new category systems."They blamed the lack of a theory of teaching on the focus of attention on creating new instruments rather than on concepts and the interpretation of those concepts. For these reasons, a system of observation that has been developed and employed in various studies at the Ohio State University was used to analyze the 16 tapes (cf. Siedentop, Birdwell and Metzler, 1979).

The O.S.U. Academic Learning Time-Physical Education Model (ALT-PE) has four major dimensions: (1) setting; (2) content; (3) learned moves; and (4) difficulty level. The setting dimension used in ALT-PE reflects Mosston's (1966) spectrum of teaching styles. The content category is divided into two main groups; those behaviours that represent a non-academic focus, for example, 'management,' 'transition,' or 'wait,' and those behaviours that represent a content-oriented physical education focus, for example, 'skill practice,' 'game,' or 'scrimmage.' The third dimension reflects the involvement of the student within the physical education content while the fourth

dimension requires the observer to judge the level of difficulty the student encounters as he is involved in physical education content. See Appendix A for behaviour definitions.

The 16 lessons were coded by the researcher. The data obtained were recorded on ALT-PE coding sheets as outlined in Appendix E. Using a table of random numbers, 20 per cent of the pupils in a class were selected for observation. This was considered a suitable representation of a class population. If, for any reason, a pupil was not visible on the video-tape, then he or she was disregarded and another pupil chosen randomly. Each student was systematically observed for three five-minute periods at the beginning, middle, and end of a class.

To ensure reliability of the coder, which is crucial to this type of research (Siedentop and Olson, 1978), segments of video-tapes were coded and recoded by the coder until a 'reliability' of .80 or higher was obtained. To eliminate possible bias in coding student behaviours, the coder familiarized herself thoroughly with the ground rules of the system and was consistent in coding behaviours that were borderline cases. The researcher also received some training in the use of the coding instrument from Dr. Daryl Siedentop who devised the system.

Independent Variables

There were three independent variables in this study:

1. The three physical activities taught by the student teachers which were basketball, dance,and indoor soccer.
2. Class size: A small class refers to between 11 pupils and 22 pupils inclusive. A large class refers to between 23 pupils and 30 pupils inclusive.
3. Sex of the teacher.

Dependent Variables

The first dependent variable in the study was the amount of 'time on task' the students were engaged in during their physical education lessons. 'Time on task' refers to the amount of ALT-PE time and ALT-PE(M) time accrued to students during these lessons. Both were measured using the O.S.U. ALT-PE Model (Sidentop, Birdwell, and Metzler, 1979). ALT-PE was ascertained by obtaining a score in seconds for student engagement in content physical education at the high success level. ALT-PE(M) was determined by obtaining a score in seconds for student engagement in motor skill tasks only in content physical education at the high success level. These scores in seconds for ALT-PE and ALT-PE(M) were then converted to

percentage scores for the observation period.

The second dependent variable was the score that each student teacher received for his/her effectiveness in attaining the pre-stated lesson objectives. Three competent judges who were qualified physical educationists independently scored each lesson, using an evaluation form, designed by the researcher, as a guide. See Appendix B. The mean of the three judges scores was taken as the student teacher's effectiveness score.

Data Analysis

The tapes were analyzed by recording the behaviours of the students every 12 seconds on the coding sheet. See Appendix E. The student behaviour for each of the 26 behaviour categories was converted to a percentage of the total observation period. The percentage of time students spent in ALT-PE and ALT-PE(M) was also determined.

The statistical procedure considered suitable was the Pooled Variance t test. Pooled variance t tests were applied to determine whether there were any significant differences between:

1. ALT-PE and ALT-PE(M) for students taught basketball, dance, or indoor soccer.
2. ALT-PE and ALT-PE(M) in large and small classes.

3. ALT-PE and ALT-PE(M) in classes taught by male and female student teachers.
4. The effectiveness of student teachers teaching basketball, dance, or indoor soccer lessons.
5. The effectiveness of student teachers teaching large or small classes.
6. The effectiveness of male and female student teachers.
7. ALT-PE and ALT-PE(M) in the four most effective and four least effective physical education lessons.

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter the results of the study are presented with discussion of the major findings. The chapter is divided into four sections each dealing with aspects of the study stated in Chapter 1 (*supra*,pp. 4-5).

A Descriptive Analysis of Student Behaviour in Basketball, Dance, and Indoor Soccer Lessons

For this analysis a total of 65 students were observed and their behaviour coded using the ALT-PE System. Of these students, 18 participated in basketball lessons, 28 in indoor soccer lessons, and 19 in dance lessons. The student observations resulted in a total of 4,875 intervals for analysis. Of those,1,350 were in basketball classes, 2,100 were in indoor soccer classes, and 1,425 in dance classes. The data in subsequent tables have been grouped according to the three activities taught: basketball, indoor soccer, and dance.

Setting Level

The percentages of occurrence for the Setting Level categories of the ALT-PE recording system for each of the three activities are presented in Table I. Of the six Setting Level categories, only two were observed to have occurred during the data collection. These were 'direct instruction' and 'task instruction.'

Table I

Percentage of Occurrence
of Setting Level Categories

Category	Basketball	Indoor Soccer	Dance	All Observations
Direct	100	88	100	96
Task	-	12	-	4

This predominance of 'direct instruction' was not considered unusual as these activities, perhaps, lend themselves to a more direct approach than other activities taught in a physical education programme. The 12 per cent instruction recorded in the 'task' setting in indoor soccer classes was recorded in one lesson where the student teacher had established a number of 'stations' so that the students could 'test' themselves in different soccer skills. These data do

suggest that the predominant method of instruction used by physical education student teachers is the 'direct instruction' method. Perhaps, they may have considered this the most appropriate mode of instruction for the type of activity being taught and for their teaching practicum situation as they were unfamiliar with the students.

Content Level

The percentage of occurrence for the Content Level categories is reported in Table 2 for each physical activity.

In the 'wait' category, the percentage of occurrence was least in the indoor soccer lessons and greatest in the dance lessons. This might possibly be explained by the fact that teachers of dance need to return to the tape recorder or record player and play back the specific piece of music needed for practising the skills being taught at that time. Consequently, the students spend extra time waiting.

For all the lessons observed, 11.1 per cent of the time was spent in the 'transition' category. The lowest percentage of 2.9 per cent for dance may be due to the type of dance classes observed. Three of the five were classes of exercise to music and so, once the music started, there was little explanation about positioning or activities related to instruction as the students were told to copy the teacher's

Table 2

Percentage of Occurrence of
Content Level Categories

Category	Basketball	Indoor Soccer	Dance	All Observations
Wait	5.9	2.9	6.9	5.2
Transition	13.2	17.3	2.9	11.1
Management	-	1.3	1.5	.9
Break	-	-	-	-
Non Academic Instruction	-	-	-	-
Skill Practice	40.9	44.8	23.7	36.5
Scrimmage	-	-	-	0
Game	5.5	4.8	-	3.4
Fitness	11.7	9.5	56.0	25.7
Other Motor Activity	-	-	-	-
Knowledge	22.8	19.3	8.3	16.8
Social Behaviour	-	-	-	-
	100.0	99.9	99.3	99.5

behaviour. Conversely, for indoor soccer, the high 'transition' period of 17.3 per cent may have resulted from the need to organize playing areas and outline boundaries for different groups during the lessons.

The total amount of managerial time in the study, 0.9 per cent, was extremely small compared to recent studies (cf. Stewart, 1977; Quarterman, 1977). This may be explained to a large degree by the definition of 'management' used in both cases. 'Management' in this study referred to activities not related to instruction, whereas Stewart and Quarterman defined 'management' in much broader terms encompassing both the 'transition' and 'management' categories of this study.

It should be noted that no student was coded in 'break,' 'non-academic instruction,' or 'social behaviour.' The 'social behaviour' category was defined as any non-instructional behaviour meant to increase student acceptance of the physical education setting. Perhaps the student teachers considered the practicum situation an unsuitable period to deal with this issue.

Of all observations in the Content Level, 82.2 per cent were in Content-PE. There is, however, a wide variability in the way the observations are distributed for the different activities taught. The dance lessons showed a very different distribution of frequencies than either the indoor soccer

or basketball lessons. Again this was due, perhaps, to the nature of the dance lessons. While the student teachers were asked to teach dance, what was seen was, frequently, more like exercises to music than dance and consequently 56 per cent of all dance lessons was devoted to fitness activities ranging from zero in two lessons to 85 per cent, 94.7 per cent, and 100 per cent in the other three lessons.

The distribution of scores in Content-PE was very similar for the soccer and basketball classes. It should be noted, however, that only 5.5 per cent and 4.8 per cent of the time in basketball and soccer respectively was devoted to 'game' playing. While it may be argued that 'skill practice' is a major part of physical education lessons, good skills in isolation drills are no substitute for practice of the skills in a game situation. This calls attention to the neglect of the 'scrimmage' situation in the physical education lessons observed. Perhaps this type of activity can be used as a progression from skill practice to the unmodified game situation. In sport situations outside of physical education classes much use is made of scrimmage activity and it might serve as a very useful teaching and learning situation in physical education classes.

The highest percentage of occurrence for the 'knowledge' category was for basketball lessons. This may be attributed to the need for long explanations about positioning in this

highly technical game. With basketball being a very popular game in the areas where these lessons were observed, the students were at a more advanced level and needed detailed explanations of the more difficult aspects of play; for example, proper positioning in offensive play. In the dance lessons, there was little need for verbal instruction because in some cases all the students had to do was mimic the teachers' actions.

Table 3

Percentage of Occurrence of Content-General and Content-PE

	Basketball	Indoor Soccer	Dance	All Observations
Content General	19.1	21.5	11.3	17.3
Content-PE	80.9	78.4	88.0	82.2

The amount of Content-General and Content-PE for each physical activity is presented in Table 3. The greatest percentage of lesson time was in the Content-PE sub-division. While the student teachers did teach in the one instructional mode, they choose various ways of reaching their instructional goals. The distribution of the 88 per cent involvement for dance lessons includes a large portion of class time in the 'fitness' category whereas in basketball and soccer 40.9 per

cent and 44.8 per cent of student time respectively was involved in 'skill practice' with 22.8 per cent and 19.3 per cent involving verbal instruction. See Table 2.

Learner Moves Level

The distribution of class time devoted to the acquisition of physical education skills is shown in Table 4. The total percentage for engaged and non-engaged behaviour does not equal 100 because decisions in the Learner Moves category were not made if the class had been coded in Content-General in the Content Setting. Of all student behaviour observed, 13.8 per cent was spent 'non-engaged' with 68.1per cent spent 'engaged.' Closer analysis of the data shows variability between the activities on engagement/ non-engagement scores. The type of dance classes observed tended towards continuous activity with no stops for skill teaching or division of students into groups. The basketball and indoor soccer lessons showed a very different trend. In basketball lessons, students spent 8.3 per cent of their time 'waiting,'while students in indoor soccer lessons spent 15.9 per cent of their time'waiting.' This kind of waiting refers to students lining up to take their turns performing a skill. This time spent waiting could be a function of such variables as the type of activity being taught, lack of space possibly due to large classes, facilities, and

Table 4

Percentage of Occurrence of Learner Moves Level Categories

Category	Basketball	Indoor Soccer	Dance	All Observations
Not Engaged Interim	2.7	3.9	0.1	2.2
Not Engaged Waiting	8.3	15.9	0.1	8.1
Not Engaged Off-task	4.1	3.6	2.6	3.4
Not Engaged	15.1	23.4	2.8	13.8
Engaged Motor	35.6	26.1	77.6	46.4
Engaged Interim	7.2	10.6	-	5.9
Engaged Cognitive	21.6	18.1	7.5	15.7
Engaged	64.4	54.8	85.1	68.1
	79.5	78.2	87.9	81.9

equipment, but it may also be a function of bad planning and bad management by the student teacher.

Table 5

Percentage of Time in Content-General and Non-Engaged Categories

Categories	Basketball	Indoor Soccer	Dance	All Observations
Content-General	19.1	21.5	11.3	17.3
Non Engaged	15.1	23.4	2.8	13.8
Total	34.2	44.9	14.1	31.1

Table 5 is a representation of data already presented but it gives a clear picture of the amount of time students were not engaged in activity related to the lesson objectives. If the small percentage of time that students were 'off task' (NO), by their own choosing, (4.1 per cent for basketball, 3.6 per cent for indoor soccer and 2.6 per cent for dance) is subtracted from the rest of this non-engaged time the remainder is the amount of time that students were doing what the teacher had told them to do. This time devoted to activity unrelated to the lesson objectives occurred because of the way the lesson was planned and presented. In the indoor soccer lessons

students were not engaged for 44.9 per cent of the time as compared to 14.1 per cent of the time in dance and 34.2 per cent of the time in basketball. A possible explanation for the high 'non-engaged' soccer score may be because there did not seem to be as great a supply of soccer balls as there were basketballs. This could reflect the bias of the teachers or the philosophy of the school administration towards one activity rather than another. It could also explain much of the time spent waiting in line for a turn to perform. With fewer balls, a teacher is also faced with more managerial and organizational problems which can take up much of the class time.

Level of Difficulty

Table 6 shows the percentage of occurrence of each of the three difficulty levels. It should be noted that these scores are a percentage of those intervals coded as engaged in the Learner Moves category. No coding at the difficulty level was done when a student was previously coded as non-engaged in a Learner Moves category.

Table 6

Percentage Occurrence of
Difficulty Level Categories

Categories	Basketball	Indoor Soccer	Dance	All Observations
Easy	94.2	93.7	95.4	94.4
Medium	5.9	6.5	4.7	5.7
Hard	-	-	0.1	0.03

It seems clear from these results that when student teachers had students engaged, they did so at an 'easy' level of difficulty for the vast majority of the time. It seems evident that the students, when actually engaged, had little difficulty coping with the tasks set by the student teachers. There was little variability in the level of difficulty scores for the different activities.

Relationship Between Student 'Time on Task' and Type of Activity Taught, Class Size, and Sex of Student Teacher

Student 'time on task' was scored in two ways. First, a student was recorded in an ALT-PE interval (for a definition see p. 6) when coded in a PE-Content category and engaged at an easy level of difficulty. Secondly, when a student was recorded as performing a motor task at the easy

level of difficulty, it was scored as an ALT-PE(M) interval (see p. 6). ALT-PE(M) is a sub-section of ALT-PE, and is more specific about the manner in which the student spends his 'time on task.'

Both ALT-PE and ALT-PE(M) have been reported for each student observed, for each class, and for each activity as a percentage of the 15 minutes observation period.

Table 7

Percentage Occurrence of
ALT-PE and ALT-PE(M)

Categories	Basketball	Indoor Soccer	Dance	All Observations
ALT-PE	60.3	50.4	80.4	63.7
ALT-PE(M)	31.3	21.6	73.0	42.0

Table 7 shows that, for the three activities, 63.7 per cent of the time observed students were involved in tasks related to the objectives of the lesson. This time includes both motor and cognitive involvement. The dance classes had the highest level of 'time on task' with 80.4 per cent, indoor soccer had the lowest percentage of time with 50.4 per cent. It could be argued from these findings that perhaps dance

lends itself more towards 'time on task' than either basketball or indoor soccer. It is probable that an activity like soccer takes considerable preparation and organizational planning when it is to be held indoors. The student teachers in this study spent an average of 44.7 per cent of their time organizing and explaining to their students what to do and where to go in both basketball and soccer classes. This time is lost to the students for development of motor skills, yet the development of such skills was the main objective of these lessons.

ALT-PE(M) refers to the amount of time on motor tasks that students were engaged at the easy level of difficulty. Across all activities, the students were engaged in motor tasks for less than half the observed time. In closer analysis of this 42 per cent, the dance lessons rated highest on motor involvement with 73 per cent 'time on task' while the soccer lessons were lowest with 21.6 per cent 'time on task.' While the objectives for the indoor soccer lessons, as stated by the student teachers, involved some skill acquisition only 21.6 per cent of the students' time was devoted to motor tasks. This allowed little time to expect that the students would achieve specified psychomotor objectives. The basketball classes showed a little more time devoted to motor involvement but two thirds of the lessons were devoted to things other than motor skill

development. These findings suggest a major discrepancy between the stated lesson objectives and the reality of the classroom situation in physical education programmes.

Further analysis of the ALT-PE and ALT-PE(M) percentages was done to establish whether there were any significant differences in the amount of ALT-PE and ALT-PE(M) that accrued to students in different activity classes taught by either female or male student teachers in big or small classes. Table 8 presents the amount of ALT-PE and ALT-PE(M) accrued by students in each of the 16 lessons. Significant differences were found between the basketball and dance lessons and between the soccer and dance lessons for ALT-PE. Significant differences were found between all three activities for ALT-PE(M). Pooled variance t tests were carried out between each of the four groups (BB,GS,GD, and BS) to determine whether there were any significant differences between the groups. The findings for ALT-PE and ALT-PE(M) are presented in Table 9. The only significant differences between the groups for ALT-PE were between the dance and indoor soccer lessons taught by female student teachers and between the dance and basketball lessons. The students in the dance lessons had significantly more time on task than the students in the soccer lessons ($p<.05$).

Table 8

Percentage of ALT-PE and ALT-PE(M) for Basketball, Dance, and Indoor Soccer Lessons

	Basketball	Indoor Soccer		Dance
	(BB)	(BS)	(GS)	GD
ALT-PE	53	51	38	61
	57	28	53	95
	69	85	56	82
	62	22		72
				92
ALT-PE(M)	34	24	18	95
	27	20	23	80
	37	23	27	39
	27	16		92
				57

Note: BB: Male student teachers teaching basketball.

GD: Female student teachers teaching dance.

GS: Female student teachers teaching indoor soccer.

BS: Male student teachers teaching indoor soccer.

Table 9

t Tests Between Basketball, Dance, and Indoor Soccer Lessons on ALT-PE and ALT-PE(M)

ALT-PE	I	II	I	II	I	II	I	II	I	II	I	II
	BB	BS	BB	GD	BB	GS	BS	GD	BS	GS	GD	GS
Mean of Group I	60.3		60.3		60.3		46.5		46.5		8.4	
Mean of Group II	46.5		80.4		49.0		80.4		49.0		49.0	
Standard Deviation I	6.0		6.0		6.0		24.7		24.7		12.6	
Standard Deviation II	24.7		12.6		7.9		12.6		7.9		7.9	
Value of t	.9		2.6*		1.8		2.4		.1		3.4*	
d.f.	6		7		5		7		5		6	

ALT-P(M)	I	II	I	II	I	II	I	II	I	II	I	II
	BB	BS	BB	GD	BB	GS	BS	GD	BS	GS	GD	GS
Mean of Group I	31.3		31.3		31.3		20.8		20.8		73.0	
Mean of Group II	20.8		73.0		22.7		73.0		22.7		22.7	
Standard Deviation I	4.4		4.4		4.4		3.1		3.1		21.2	
Standard Deviation II	3.1		21.2		3.7		21.2		3.7		3.7	
Value of t	3.4*		3.4*		2.3		4.3*		.6		3.5*	
d.f.	6		7		5		7		5		6	

*Difference is significant $p < .05$

Note: BB: Basketball taught by male student teachers.
BS: Indoor soccer taught by male student teachers.
GD: Dance taught by female student teachers.
GS: Indoor soccer taught by female student teachers.

When t tests were carried out on ALT-PE(M) between the activities a different trend was observed. Significant differences at the .05 level were found between: (1) the girls in the dance and the indoor soccer classes; (2) the boys and girls in basketball classes and the girls in dance classes; (3) the students in the basketball classes and the students in the dance classes; and (4) the students in the basketball classes and the students in the indoor soccer lessons taught by male student teachers. A possible explanation of these differences may be due to the nature of the dance lessons where the involvement was almost totally motor as distinct from the larger cognitive aspect involved in the teaching and learning of basketball and soccer skills. This is not to suggest that there is no cognitive aspect to dance but that the interpretation of dance for three of the observed student teachers was physical fitness to music without an attempt to teach an awareness and understanding of the principles of fitness and/or rhythmics.

The data were re-organized to determine whether the amount of accrued ALT-PE and/or ALT-PE(M) differed for students taught by male or female student teachers. The results show that students in classes taught by female student teachers had significantly more ALT-PE(M) time than those taught by male student teachers(see Table 10). The average score of ALT-PE(M) for classes taught by female student teachers

Table 10

t Tests Between Physical Education Classes Taught by Male and Female Student Teachers on ALT-PE and ALT-PE(M)

	ALT-PE	ALT-PE(M)
Mean of Males	50.38	26.0
Mean of Females	63.63	54.13
Standard Deviation (M)	19.25	6.48
Standard Deviation (F)	18.81	29.66
Value of t	1.50	2.5*
d.f.	14	14

*Difference is significant, $p < .05$

was 54.13 per cent while it was 26 per cent in those classes that were taught by male student teachers. Too much importance should not be attached to this difference because male and female student teachers did not teach similar activities and this may have influenced the result. A different design of study from the one used here is needed to test validly this question.

The *t* tests done for ALT-PE and ALT-PE(M) between large and small classes are presented in Table 11. No significant difference was found for either ALT-PE or ALT-PE(M) between large and small classes. This finding differs from a study by Lauback (1975) who found the students

Table 11

t Tests Between Large and Small Physical Education Classes on ALT-PE and ALT-PE(M)

	ALT-PE	ALT-PE(M)
Mean of Large Classes	54.29	35.29
Mean of Small Classes	66.56	43.78
Standard Deviation (L)	20.01	24.24
Standard Deviation (S)	19.13	26.12
Value of t	1.17	.62
d.f.	14	14

in large classes spent less time waiting than those in smaller classes. Because of a possible interaction between class size and activity taught no conclusions can be drawn on this aspect of the study.

Teacher Effectiveness and Its Relationship To Class Size, Sex of Student Teacher, and the Different Physical Activities Taught

The 16 physical education lessons video-taped were scored as to the effectiveness of the student teachers in attaining the stated lesson objectives. Three qualified physical educationists evaluated the tapes using an evaluation sheet as a check list. See Appendix B . Each of the teacher behaviours listed on the evaluation sheet had been found in previous studies to be postively related

to student achievement. The lessons were then ranked from one to 16; one being the most effective lesson and 16 being the least effective.

Reliability of the Judges. To establish reliability, each of the judges evaluated four of the tapes a second time. This was done at least one week after they had first viewed the tapes. All three judges evaluated the same four tapes which were randomly selected from the 16 tapes. A Pearson Correlation was calculated on the 12 sets of pairs. A reliability of .75 was obtained. See Appendix G .

The scores for teacher effectiveness ranged from 20.0 to 37.0 on a 50 point scale with a mean score of 30.1 and a standard deviation of 6.9. Lessons were then grouped according to the activity taught, to determine whether the student teachers were more effective teaching one activity rather than another. Six t tests were done on the effectiveness scores between male student teachers teaching basketball and indoor soccer and female student teachers teaching dance and indoor soccer. As can be seen from Table 12,no significant differences were found between the groups. These findings seem to indicate that regardless of the activity being taught the most effective teachers can cope equally well in different teaching situations. The findings here indicate only that different student-teachers teaching different activities did not rate

Table 12

t Tests Between Basketball, Dance, and Indoor Soccer Lessons on Effectiveness Scores

Effectiveness	BB-BS	BB-GD	BB-GS	BS-GD	BS-GS	GD-GS
Mean of Group I	30.35	30.35	30.35	26.13	26.125	31.9
Mean of Group II	26.125	31.9	31.97	31.90	31.97	31.97
Standard Deviation I	3.90	3.90	3.90	6.06	6.06	4.97
Standard Deviation II	6.06	4.97	0.29	4.97	0.29	.28
Value of t	1.02	0.45	0.61	1.38	1.41	.02
d.f.	6.	7.	5.	7.	5.	6.

(for p = .05, t = 2.5)

Note: BB: Male teachers teaching basketball.
BS: Male teachers teaching indoor soccer.
GD: Female teachers teaching dance.
GS: Female teachers teaching indoor soccer.

differently across all activities although the scores for the female indoor soccer lessons were all around the 32 point mark.

Table 13

Effectiveness Scores for Basketball, Dance, and Indoor Soccer Lessons

	Basketball	Indoor Soccer	Dance
	26.6	32.3	37.0
	32.6	31.6	24.6
	26.6	32.0	27.3
Effectiveness Rating	35.6		35.3
		34.3	33.3
		20.0	
		29.6	
		20.6	

Table 14

t Test Between Male and Female Student Teachers on Effectiveness Scores

	Effectiveness
Mean of Male Scores	28.24
Mean of Female Scores	31.93
Standard Deviation (M)	5.52
Standard Deviation (F)	3.98
Value of t	1.44
d.f.	14

(for $p = .05$, $t = 2.1$)

The effectiveness scores were analyzed to determine if male or female student teachers were more effective. No significant difference was found (see Table 14).

Finally a t test was carried out on the effectiveness scores to discover whether student teachers tended to be more effective teaching large or small classes. The result of that test is presented in Table 15. No significant difference was found. It may be that the more effective student teachers could cope equally well with either a large or small class and the opposite being the case for the less effective student teachers.

Table 15

t Test Between Student Teachers Teaching Large and Small Classes on Effectiveness Scores

	Effectiveness
Mean of Large Classes	30.66
Mean of Small Classes	29.63
Standard Deviation (L)	4.94
Standard Deviation (S)	5.23
Value of t	.37
d.f.	14

(for p = .05, t = 2.1)

Teacher Effectiveness and Student 'Time on Task'

The scores for ALT-PE and ALT-PE(M) for the four most effective and the four least effective lessons are presented in Table 16. At first glance it seems as if the more

Table 16

Percentage of ALT-PE and ALT-PE(M) Accrued by Students in the Most Effective and Least Effective Physical Education Lessons

	ALT-PE		ALT-PE(M)	
	Most Effective	Least Effective	Most Effective	Least Effective
	61	28	59	20
	62	22	37	16
	72	95	39	95
	92	69	92	27
Average	71.8	53.5	56.8	39.5

effective lessons had the greater amount of student 'time on task' with 71.8 per cent and 56.8 per cent for ALT-PE and ALT-PE(M) respectively as compared to 53.5 per cent and 39.5 per cent in the least effective lessons. On further analysis, a t test showed that there was no significant difference between the groups (see Table 17). This can be explained in part because one of the lessons rated least

Table 17

t Tests Between the Most Effective and the Least Effective Physical Education Lessons on ALT-PE and ALT-PE(M)

	ALT-PE	ALT-PE(M)
Mean of Most Effective Group	71.8	56.8
Mean of Least Effective Group	53.5	39.5
Standard Deviation (M)	14.04	26.65
Standard Deviation (L)	34.66	37.28
Value of t	0.96	0.75
d.f.	6	6

(for p= .05, t = 2.5)

effective by the judges had 95 per cent student involvement during the lesson. The involvement was to copy the various exercises performed by the student teacher. This was not done in time to the music,did not involve any explanation of fitness principles,and the judges considered the students gained little from the activity despite being almost totally involved in a vigorous work-out. While the ALT-PE model differentiates on the quality of student behaviour on task, it does not differentiate on the quality of activity chosen to reach stated lesson objectives. In the case of three of the dance lessons observed, the lesson objectives and activities pursued would be more appropriately classified as calisthenics and not dance. The judges had difficulty in

evaluating these lessons using the evaluation sheet provided knowing that what the student teachers had been asked to teach was 'dance.' While no significant differences for ALT-PE or ALT-PE(M) were found between the most effective and the least effective lessons, the two problems outlined above explain these results.

For a summary of the data see Appendix H.

CHAPTER V

SUMMARY AND REVIEW

A review of the study is presented in this chapter together with conclusions drawn from the main findings. Implications of the results are also considered with recommendations for further research.

A Review of the Study

The purpose of this study was fourfold: (1) to describe student behaviour in basketball, dance, and indoor soccer lessons; (2) to examine the relationships between these activities, class size, and sex of student teachers on the amount of student 'time on task'; (3) to analyze the relationship between teacher effectiveness and the activities taught, class size, and sex of the student teacher; and (4) to investigate the relationship between student 'time on task' in the four most effective and four least effective lessons.

Sixteen physical education lessons, taught by student teachers, were video-taped in secondary schools throughout Southern British Columbia and Vancouver Island. Twenty per cent of each class was randomly selected for observation.

Each student was individually observed and coded every 12 seconds for three five-minute periods at the beginning, middle, and end of the lesson. The data were subjected to descriptive statistical analysis for each level of the coding interval. The percentage of accrued ALT-PE and ALT-PE(M) was determined for each of the 65 subjects, for each class, and for each activity. Pooled variance *t* tests were completed to reveal any relationships between ALT-PE and ALT-PE(M) for the different activities taught, class size, and sex of student teacher. The only significant differences found were for ALT-PE(M) in the different activities taught.

All 16 lessons were evaluated and scored by three competent and experienced physical educationists. There were no significant differences in effectiveness for activities taught, for class size, or for sex of student teachers.

A final analysis of the data was completed to determine if there were any significant differences for ALT-PE and ALT-PE(M) between the four most effective and the four least effective lessons as scored by the judges. The results of *t* tests on these data showed no significant differences for ALT-PE or ALT-PE(M) between the best and the worst lessons. These results may be explained because of the great variability in accrued student 'time on task'

for the least effective lessons. While student 'time on task' is an important variable in teachers' effectiveness to fulfill the stated lessons' objectives (Rosenshine and Furst, 1973; Dunkin and Biddle, 1974) it is not the only variable that constitutes effective teaching. The result of this aspect of the study supports the claim by Brophy and Evertson (1976) that effective teaching is an "orchestration of a variety of skills" at different times under different circumstances. Three of the dance lessons in this study were examples of total student involvement in fitness activities that related to the objectives of the lessons, yet the lessons were scored low by the judges because they considered the lessons lacked any variety, challenge, and cognitive or creative stimulation for the students. The students' task throughout each lesson was to imitate the teacher. While the judges considered fitness to be an integral part of physical education, they did not agree that it should take up the total class time of a 'dance' lesson.

Conclusions of the Study

The conclusions presented here are drawn from the data related to the initial questions posed in this study (*supra*, pp. 4-5).

Student Teacher and Student Behaviour in Secondary Physical Education Classes

1. The 'direct' instructional mode was used by all student teachers for more than 90 per cent of their teaching. While they may have been aware of other methods of instruction, they were either unwilling and/or unable to apply them.
2. Over 80 per cent of class time was devoted to activities directly related to the instructional goals of the lesson.
3. There was great variability in how class time was distributed with 56 per cent of class time devoted to fitness in the dance lessons and nearly 45 per cent of class time devoted to skill practice in basketball and indoor soccer lessons.
4. Sixteen per cent of student time was devoted to cognitive activities. This ranged from 8.3 per cent in dance lessons to 22.8 per cent in basketball lessons.
5. Of the 81.9per cent of class time devoted to Content-PE activities, students were 'engaged' for 68.1per cent of the time. This ranged from 85.1 per cent involvement in dance lessons to 54.8 per cent in indoor soccer lessons.
6. The largest amount of 'non-engaged' time was spent waiting to respond.

7. When students were engaged in activities related to the instructional objectives of the lesson, they did so at an easy level of difficulty for over 90 per cent of the time. The problem for student teachers lay not in the type of activity they presented to the student but in keeping the students in contact with that activity for as much of the class time as possible.

Time on Task and Its Relationships to Activity Taught, Class Size, and Sex of Student Teacher

1. The type of activity taught seemed related to the amount of accrued student 'time on task.' The dance lessons had the greatest amount of student involvement while the indoor soccer lessons had the least amount of student involvement.
2. Size of class had no relationship to the amount of student 'time on task.' This could imply either one of two things: the dividing point for big and small classes in this study did not allow for such a difference to be observed, or secondly the student teachers planned their lessons to cater for the bigger numbers. Lauback (1975) found that students in smaller classes spent more time waiting.
3. Although a significant difference between male and female student teachers was found for ALT-PE(M),

this result was probably influenced by the type of activity taught rather than by the sex of the student teacher. The effect of the interaction of sex and activity taught could not be measured as the number of lessons in the study was too small to apply an analysis of variance.

Teaching Effectiveness and Its Relationship to Activities Taught, Class Size, and Sex of Student Teacher

1. Competent and experienced physical educationists can be reliable in evaluating physical education lessons.
2. The type of physical activity taught, class size, and sex of the student teacher were not found, in this study, to be factors in the effectiveness of the student teachers to fulfill their stated lesson objectives.

Teacher Effectiveness and Student 'Time on Task'

1. While 'time on task' is an important variable in teacher effectiveness (Rosenshine and Furst, 1973; Dunkin and Biddle, 1974), no significant difference for student 'time on task' was found in this study between the most and the least effective lessons. The conclusion drawn was that student involvement alone did not make for an effective lesson. Other variables such as variety, enthusiasm of class,

pacing of lesson, and clarity of goals are important ingredients of an effective lesson. Students may be 'on task' because their behaviour relates to the specified objectives of the lesson. Whether these objectives are appropriate for that class, for that activity, or for physical education is a different but equally important question.

Implications of the Findings

1. The ALT-PE Model can describe student behaviour in a variety of physical education settings. It is a useful way to diagnose weaknesses in a student-teacher's teaching techniques.
2. Planning and organization of physical education lessons must be specific to an activity. Different activities require more time in the cognitive aspect because of the nature of the activity, for example, tactical play in basketball. Other activities require more careful organizational planning because of confined spaces and lack of equipment with, for example, indoor soccer lessons.
3. The more traditional forms of dance, for example, folk, social, square, and creative dancing do not seem to be as popular with student teachers as 'fitness to music' classes. The value of such an activity as part of a

dance unit needs to be evaluated very closely. Perhaps it is more in keeping with modern teenage interests than with the fulfillment of educational objectives.

Recommendations for Further Research

1. To discover how physical educators teach different activities, it is recommended a study be designed to analyze student and teacher behaviours, with the emphasis on intensive observation of a small sample of teachers, teaching their classes different activities, in a physical education programme. Methods of organization, management, and student involvement could be analyzed using the ALT-PE Model, to determine whether specific approaches are more suitable to teach different activities.
2. The use of the ALT-PE Model in 'intervention' studies could be a major advancement in the improvement of student teachers' skills. This type of 'intervention' work has just begun at The Ohio State University and the early results show great possibilities for the systematic improvement of teaching skills.
3. The video-taping of lessons, as carried out in this study, allows reanalysis of the data collected to investigate other problems. However, the live coding

situation is a more valid measure of teacher and student behaviour, because the coder obtains a clearer perception of what is happening during the lesson.

BIBLIOGRAPHY

Anderson, W.G. "Descriptive and Analytic Research on Teaching." *Quest*. Monograph, 15: 1-8, 1971.

----------. "Teacher Behaviour in Physical Education Classes." An unpublished paper. Teachers College, 1974.

Armento, B.A. Teacher verbal cognitive behaviors related to student achievement on a social concept test. An unpublished doctoral dissertation. Indiana University, 1977.

Bales, R.F. *Interaction Process Analysis: A method for the study of small groups*. Cambridge, Mass.: Addison-Wesley, 1950.

Bellack, A.A. (ed.). *Theory and Research in Teaching*. New York: Teachers College Press, 1963.

Berliner, D.C. "Academic Engaged Time." An unpublished paper. Far West Laboratory, 1977.

Berliner, D.C. and W. Tikunoff. "The California Beginning Teacher Evaluation Study: Overview of the Ethnographic Study." *Journal of Teacher Education*, 27: 5-11, Spring, 1976.

Bigge, Morris L. *Learning Theories for Teachers*. New York: Harper and Row, 1964.

Bloom, B.S. *Human Characteristics and School Learning*. New York: McGraw Hill, 1976.

Bookhout, D.C. "Teaching Behavior in Relation to the Socio-Emotional Climate of P.E. Classes." *Research Quarterly*, 38: 336-347, October, 1967.

Brophy, Jere E. "Reflections on Research in Elementary Schools." *Journal of Teacher Education*, 27: 31-34, Spring, 1976.

Brophy, J.E. and C.M. Evertson. *Learning From Teaching: A Developmental Perspective*. Boston: Allyn and Bacon, 1976.

Brophy, J. and T. Good. *Teacher-student relationships.* New York: Holt, Rinehart, and Winston, 1974.

Cheffers, J.T.F. The validation of an instrument design to expand the Flanders system of Interaction Analysis to describe non-verbal interaction in different varieties of teacher behaviour and pupil responses. Unpublished doctoral dissertation, Temple University, 1972.

----------. "Systematic Observation: Scales, Systems and Techniques of Observations." *Proceedings of the NAPECW/NCPEAM.* Denver, 1978, pp. 124-131.

Costello, J.A. A descriptive analysis of student behavior in elementary school physical education classes. Unpublished doctoral dissertation, Teachers College, 1977.

Cratty, Bryant J. *Movement Behaviour and Motor Learning.* Philadelphia: Lea and Febiger, 1964.

Davitz, Joel Robert and Louis Davitz. *Evaluating Research Proposals in the Behavioral Sciences: A Guide.* New York: Teacher College Press, 1977.

Dembo, M. and L. Jennings. "Who is the 'experienced' teacher?" Paper presented at the annual meeting of the American Educational Research Association, New Orleans, 1973.

Dougherty, N.D. "A Plan for the Analysis of Teacher Pupil Interaction in the P.E. Class." *Quest*, 15: 39-49, 1971.

Dunkin, M.J. and B.J. Biddle, *The Study of Teaching.* New York: Holt, Rinehart, and Winston, 1974.

Eisner, Elliot W. "A Concept of Teaching." *Elementary School Journal*, 65: 115-119, 1964.

Evertson, C. and J.E. Brophy. "High Inference Behavioral Ratings as Correlates of Teaching Effectiveness." Texas University, Austin: Research and Developmental Centre for Teacher Education, 1974.

Fishman, Sylvia. A procedure for recording augmented feedback in physical education classes. An unpublished doctoral dissertation, Teachers College, 1974.

Flanders, N.A. *Analyzing Teaching Behavior*. Reading, Mass.: Addison Welsey, 1970.

Freedman, M.S. "Follow-up of physical education graduates from a teacher education program. A descriptive analysis." Abstract in *Dissertation Abstracts International*, 39: 08, 4806A, 1979.

Gage, N. (Ed.) *Handbook of Research on Teaching*. Chicago: Rand McNally, 1963.

Gage, N.L. "A Factorially Designed Experiment on Teacher Structuring, Soliciting and Reacting." *Journal of Teacher Education*, 27: 35-38, 1976.

Gallagher, J.J., G.A. Nuthall, and B. Rosenshine. *Classroom Observation*. Chicago: Rand McNally, 1970.

Gentile, A.M. "A Working Model of Skill Acquisition With Application to Teaching." *Quest*, 17: 3-23, 1972.

Good, Thomas L. "Teacher Effectiveness in the Elementary School." *Journal of Teacher Education*, 30: 52-64, 1979.

Good, Thomas L., Bruce Biddle and J.E. Brophy. *Teachers Make a Difference*. New York: Holt, Rinehart, and Winston, 1975.

Green, R. et al. The educational status of children during the first year of school following four years of little or no schooling. East Lansing, Mich.: College of Education, Michigan State University, 1966.

Hall, R.V., D. Lund, and D. Jackson. "Effects of Teacher Attention on Study Behavior." *Journal of Applied Behavior Analysis*, 1: 1-12, 1968.

Hall, R.V., J.C. Delgradri, and J.W. Harris. Opportunity to Respond: A New Focus in the Field of Applied Analysis. Paper presented at the Midwest Association of Applied Behaviour Analysis, Chicago, Illinois, May 1977.

Herbert, J. and C. Attridge. "Guide for Developers and Users of Observation Systems and Manuals." *American Educational Research Journal*, 12: 1-20, 1975.

Highet, Gilbert. *The Art of Teaching*. N.Y.: Vintage Books, 1954.

Hughes, M.M. Utah Study of the assessment of teaching. In A.A. Bellack (Ed.), *Theory and Research in Teaching*. New York: Teacher College Press, 1963, pp. 25-36.

Johnson, S. and O. Bolstad. Methodological issues in naturalistic observation: some problems and solutions in B. Hameslynck (Ed.), *Behavioral Change*. Champaign: Research Press, 1975.

Lauback, S.A. "The Development of a system of coding student behavior in physical education classes." Unpublished doctoral dissertation, Teachers College, 1975.

Lawther, John D. *The Learning and Performance of Physical Skills*. Englewood Cliffs, N.J.: Prentice Hall, 1968.

Lewis, George T. "Individualized Teacher Behavior Analysis System." An unpublished paper, Ohio University, (n.d.), [1978].

Locke, Lawrence F. *Research in Physical Education*. New York: Teachers College Press, 1969.

----------. "Research on Teaching P.E.: New Hope for a Dismal Science.: *Quest*. 28: 2-16, Summer, 1977.

----------. "Learning From Teaching." in J.J. Jackson (ed.), *Theory into Practice*. Victoria: University of Victoria, 1979.

McDonald, F., Elias, P. "The Effects of Teacher Performance Pupil Learning, Beginning Teacher Education Study: Phase II, Final Report." Princeton, N.J.: Education Testing Service, 1976. Vol. I.

Marliave, R., C. Fisher and W. Dishaw. "Academic Learning Time and Student Achievement in the A-B Period." Technical Note V-1a, 1977.

Medley, D.M. "A Tentative Framework for the Study of Effective Teacher Behavior." *Journal of Experimental Education*, 20: 317-325, 1962.

Medley, D.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.

Morgenegg, Bruce. "The pedagogical functions of physical education teachers." Unpublished doctoral dissertation, Teachers College, 1974.

Mosston, Muska. *Teaching Physical Education*. Ohio: Merrill, 1966.

Nixon, J.E. and L. Locke. "Research on Teaching P.E." In R.M.W. Travers', *2nd Handbook of Research on Teaching*. Chicago: Rand McNally, 1973, pp. 1210-1242.

Popham, W.J. "Performance Tests of Proficiency: Rationale, Development, and Justification." *American Educational Research Journal*, 8: 105-117, 1971.

Powell, M. "Educational Implications of Current Research on Teaching." *The Educational Forum*, 43: 27-38, 1978.

Quarterman, J. "Descriptive analysis of physical education teaching in the elementary school: Abstract in *Dissertation Abstracts International*, 39: 02, 754A, 1978.

Rarick, G.L. "Concepts of Motor Learning: Implications for Skill Development in Children." University of California: Berkeley, n.d.,[1974].

Rosenshine, B. "Evaluation of Classroom Instruction." *Review of Educational Research*, 40: 279-300, 1970.

----------. *Teaching Behavior and Student Outcomes*. London: National Foundation of Educational Research, 1971.

Rosenshine, B.V. and D.C. Berliner, "Academic Engaged Time." *British Journal of Teacher Education*, 40: 9-15, 1978.

Rosenshine, B. and N. Furst. "Research on Teacher Performance Criteria." in B.O. Smith (ed.), *Research In Teacher Education: A Symposium*. Englewood Cliffs, N.J.: Prentice-Hall, 1971.

----------. "The Use of Direct Observation to Study Teaching," in R.M.W. Travers (ed.), *Second Handbook of Research on Teaching*. Chicago: Rand McNally and Co., 1973, pp. 122-183.

Shavelson, R. and N. Dempsey-Atwood, D. "Generalizability of Teaching Behaviour." *Review of Educational Research*, 46: 553-611, 1976.

Siedentop, D. and C. Hughley. "O.S.U. teacher behaviour rating scale." *Journal of Physical Education and Recreation*, 46: 45, February, 1975.

Siedentop, Daryl, D. Birdwell, and M. Metzler. "A Process Approach to Measuring Teaching Effectiveness in Physical Education." An unpublished paper at Ohio State University, 1979.

Siedentop, Daryl and Janice Olson. "The Validity of Teacher Behavior Observation Instruments in Physical Education." Address presented at the NCPEAM-NAPECW Conference, Denver, June, 1978.

Simon, Anita and E. Boyer. *Mirrors for Behavior: An Anthology of Classroom Observation Instruments.* Vol. 1-6. Philadelphia: Research for Better Schools, 1970.

Skinner, B.F. *The Technology of Teaching.* New York: Appleton-Century-Crofts, 1968.

Skinner, Ruth. "Effect of Practice on Decision Process in Learning a Motor Skill." *Quest*, 17: 35-41, 1972.

Smith, B.O. "A Concept of Teaching." *Teachers College Record*, 61: 229-252, 1960.

Soar, R.S. "Follow Through Classroom Process Measurement and Pupil Growth: a final Report." College of Education, University of Florida, 1973.

Soar, R.S. and M.S. Soar. "An Attempt to Identify Measures of Teacher Effectiveness from Four Studies." *Journal of Teacher Education*, 27: 261-266, 1976.

Stallings, J.A. "How Instructional Processes Relate to Child Outcomes in a National Study of Follow Through." *Journal of Teacher Education*, 27: 43-47, 1976.

Stephens, J. *The Process of Schooling.* New York: Holt, Rinehart, and Winston, 1967.

Stewart, M.J. "A descriptive analysis of teacher behavior and it's relationship to pressage and context variables." An abstract in *Dissertation Abstracts International*, 38:08, 4662A, 1978.

Tobey, C.A. A descriptive analysis of the occurrences of augmented feedback in physical education classes. An unpublished doctoral dissertation, Teachers College, 1974.

Young, Richard W. The Effects of Various Reinforcement Contingencies on Second Grade Physical Education Class. An unpublished doctoral dissertation, Ohio State University, 1973.

APPENDIX A

OHIO STATE UNIVERSITY ALT-PE MODEL

THE OHIO STATE UNIVERSITY ALT-PE MODEL

Categories

ALT-PE coding format as 27 categories, six to describe the setting, five reflecting general content, seven relating to physical education content, six describing engaged and nonengaged learner moves, and three relating to the difficulty level of the learner involvement. The category titles, brief definitions and coding symbols are listed below.

Setting

Direct instruction (D)	Teacher controls instruction, focus, and pacing of instruction
Task (T)	Instruction defined by task - multiple station and/or multiple task
Reciprocal (R)	Students in pairs for instruction and feedback
Group (G)	Same functions as reciprocal with larger group
Guided discovery (GD)	Teacher leads students toward predetermined goal through series of sequenced prompts
Problem solving (P)	Teacher controls instruction through sequenced problems in which alternative solutions are possible

Content-General

Wait (W)	Periods of no activity and no movement between activities
Transition (T)	Periods of change from one activity to another (includes lining up or quieting down for next activity)
Management (M)	Time devoted to class business that is unrelated to instructional activity
Break (B)	Intentional periods of no activity to rest students, drink water, etc.

Non-academic instruction (N)	Activities which fall outside the narrow domain of focused instruction, such as rapport building

Content-PE

Skill practice (P)	Participation in drills and other activities in which the primary goal is individual skill development
Scrimmage (S)	Controlled group practice in which instruction and feedback are frequent
Game (G)	Practice under game conditions
Fitness (F)	Repetitive activities for fitness development such as exercising, running laps, weight lifting - also warm up and cool down activities such as stretching
Other motor activity (O)	Motor activity unrelated to specific goals of the day's instruction
Knowledge focus (K)	Activities which have knowledge about skill, fitness, background information, etc. as the focus
Social behavior (B)	Activities in which social behavior, attitudes, etc., are the focus

Learner Moves

Engaged, motor response (M)	Student is performing a skill
Engaged, indirect participation (I)	Student is in an activity but is not directly involved with the immediate action
Engaged, cognitive (C)	Cognitive involvement related to instruction, such as listening, questioning, verbal responding, or thinking about the activity (as in problem solving)

Not engaged, interim (NI)	Any noninstructional activity that is part of the PE activity (such as changing equipment, changing sides of the court, etc.)
Not engaged, waiting (NW)	Time during activity when student is waiting for help or waiting to participate again
Not engaged, off-task (NO)	Periods when student is inappropriately disengaged from the lesson, including socializing, daydreaming, and mishaving

Difficulty Level

Easy (E)	Few errors are made and student performs appropriately with little effort, experiencing success frequently
Medium (M)	Any performance that is other than easy or hard
Hard (H)	Many errors are made and student appears to be unable to perform appropriately, experiencing lack of success frequently

APPENDIX B

EVALUATION SHEET USED BY THE JUDGES

EVALUATION SHEET

Tape #_____

Judge: _____

Activity: _____

Size of class: Big Small Grade Level: _____

Sex of teacher: _____

	EXCELL.	GOOD.	SATIS.	WEAK	UNSATIS.
CLARITY: presentation; enunciation and articulation of language; were all instructions by the teacher clearly understood by the students? Did the teacher check for understanding?					
VARIABILITY: use of a variety of teaching materials and/or tasks to maintain and stimulate interest in the lesson. Flexibility in procedures and adaptability to the unexpected situation.					
ENTHUSIASM: a teacher's involvement and excitement in the lesson and the ability to transfer that enthusiasm to the students, by way of voice inflection (changes in pitch or tone of voice), gesture, and movement.					
STUDENT OPPORTUNITY TO LEARN: opportunity given by the teacher to allow students to learn what is desired of them for the lesson. Participation level of students during lesson in physical activity or cognitive activity if specified as an objective of the lesson.					

	EXCELL.	GOOD.	SATIS.	WEAK	UNSATIS.
TASK ORIENTED-BUSINESS LIKE: the teacher is achievement oriented in terms of challenging the students to reach their potential throughout the lesson. Concerned that the student is learning rather than merely enjoying himself.					
MANAGEMENT: getting and holding attention; withitness i.e. knowing what is going on in the gym at all times. Overlappingness i.e. the ability to attend to two issues simultaneously.					
PACE OF LESSON: the appropriate division of the lesson into it's different segments. Smoothness, i.e. the teacher's ability to move the pupils on from one phase of the lesson to the next without breaking the rhythm of the lesson.					
THE TEACHER'S USE OF QUESTIONING: the amount, suitability, timing, and the development of responses to questions.					
LESSON PREPARATION AND DEVELOPMENT: Knowledge of materials, proper teaching progressions, appropiate order, significant detail relative to the skill level of the pupils.					
OVERALL IMPRESSION OF THE LESSON: taking all the circumstances into consideration, how effective was the teacher in this lesson? Clarity of aims, accomplishment of these aims.					

APPENDIX C

SUMMARY OF THE CLASSES ANALYZED

SUMMARY OF THE CLASSES ANALYZED

Activity	Sex of Teacher	Sex of Class	Class Size	Grade
Basketball	Male	Co-Ed	Big	Senior
Basketball	Male	Co-Ed	Big	Senior
Basketball	Male	Co-Ed	Small	Senior
Basketball	Male	Co-Ed	Big	Junior
Indoor Soccer	Male	Male	Small	Junior
Indoor Soccer	Male	Male	Small	Junior
Indoor Soccer	Male	Co-Ed	Small	Senior
Indoor Soccer	Male	Male	Big	Senior
Dance	Female	Female	Small	Senior
Dance	Female	Female	Small	Senior
Dance	Female	Female	Small	Junior
Dance	Female	Female	Small	Senior
Dance	Female	Female	Big	Junior
Indoor Soccer	Female	Female	Big	Junior
Indoor Soccer	Female	Female	Big	Junior
Indoor Soccer	Female	Female	Small	Junior

APPENDIX D

LETTERS REQUESTING SCHOOL APPROVAL

UNIVERSITY OF VICTORIA
P.O. BOX 1700, VICTORIA, BRITISH COLUMBIA, CANADA V8W 2Y2
TELEPHONE (604) 477-6911, TELEX 049-7222

School of Physical Education
Faculty of Education

February 20th.

Dear

I am a graduate student in physical education at the University of Victoria, B.C. and involved in a physical education project entitled "Teaching Effectiveness in Physical Education" in part fulfillment of the requirements for my degree of Master of Arts.

The project involves video-taping student teachers and teachers while teaching physical education lessons under normal class conditions. Some of the professional year students from the University will be on spring practicum in your school district from April 8th to May 16th inclusive. I would be grateful for your approval to visit these student teachers in their respective schools and video-tape them teaching one or two physical education lessons.

The lessons will later be analyzed and rated for teacher effectiveness, to discover whether student opportunity to engage in tasks specific to the lesson objective correlates with effectiveness, regardless of the physical activity persued, the class size, or the sex of the teacher.

Your co-operation in obtaining permission to approach the schools would be greatly appreciated.

Yours sincerely,

[redacted]

UNIVERSITY OF VICTORIA
P.O. BOX 1700, VICTORIA, BRITISH COLUMBIA, CANADA V8W 2Y2
TELEPHONE (604) 477-6911, TELEX 049-7222

Faculty of Education

March 10, 1980

Dear

In partial fulfillment of our requirements for the Master of Arts degree at the University of Victoria, we are conducting a study on "Teaching Effectiveness in Secondary School Physical Education". This project involves videotaping fifty Physical Education classes throughout the province of British Columbia. The lessons will be analyzed at a later date to determine how pupil behaviours in the gymnasium situation correlate with teacher effectiveness.

We hope to have as our subjects the fifth year U-Vic student teachers who will be on practicum at your school April 8-May 16 inclusive, and their sponsor teachers.

As we have previously contacted your district superintendent for his approval, we would greatly appreciate your permission to approach the student and sponsor teacher(s) to ask for their co-operation. We do not foresee any class or schedule disruption.

We are well aware of your busy schedule and therefore ask that at your earliest convenience, you complete the enclosed form and

return it to us in the envelope. We will inform you shortly of the exact date of filming at your school. Thank-you.

Yours truly,

[redacted]

Mary O'Sullivan, M.A. Student

[redacted]

Dr. J. J. Jackson, Thesis Comm. Chairman

[redacted]

Jaye Hickey, M.A. Student

[redacted]

Dr. F. L. Martens, Thesis Comm. Chairman

TEACHER EFFECTIVENESS IN PHYSICAL EDUCATION

I, as principal, (approve/disapprove) _____ of the filming of student teachers and teachers on my Physical Education staff for the aforementioned study.

_____ _____

(signature) (school)

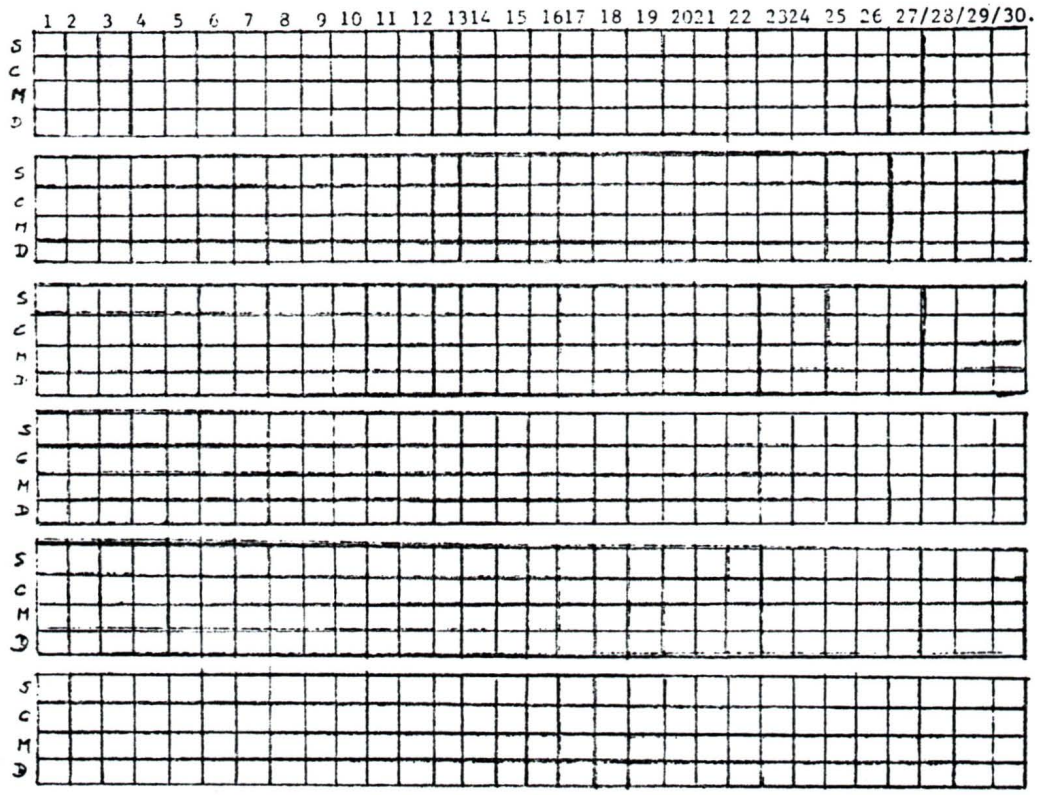
APPENDIX E

A SAMPLE CODING SHEET

ALT-P.E. CODING SHEET.

TAPE# _____. STUDENT I.D. _____

ACTIVITY _____.



Setting	Content-General	Content-PE	Learner Mover		Diff. Level
			Not Engaged	Engaged	
Dir. Instr.(D)	Wait(W)	Skill Prac.(P)	Interim(NI)	Motor Res.(M)	Easy(E)
Task(T)	Transition(T)	Scrimmage(S)	Waiting(NW)	Indirect(I)	Medium(M)
Recipreal(R)	Management(M)	Game(G)	Off-Task(NO)	Cognitive(C)	Hard(H)
Group(G)	Break(B)	Fitness(F)			
Guid. Dis.(GD)	Non Academic	Knowledge(K)			
Prob.Sol.(P)	Instr.(N)	Soc. Behav.(B)			
		Other Motor(O)			

APPENDIX F

SUMMARY DATA SHEET

SUMMARY DATA SHEET

Activity	Sex of Teacher	Size of Class	ALT-PE %	Ranking in ALT-PE	ALT-PE(M) %	Ranking in ALT-P(M)	Effectiveness Score	Ranking in Effectiveness	Tape Number
Basketball	Male	Large	53	11	27	8	26.6	12	26
Basketball	Male	Large	57	9	34	7	32.6	6	27
Basketball	Male	Small	69	6	27	8	26.6	12	44
Basketball	Male	Large	62	7	37	6	35.6	2	48
Mean			60.25		31.25		30.35		
Indoor Soccer	Male	Small	51	13	24	11	34.3	5	33
Indoor Soccer	Male	Small	28	15	20	14	20.0	16	37
Indoor Soccer	Male	Small	85	3	23	12	29.6	10	35
Indoor Soccer	Male	Large	22	16	16	16	20.6	15	47
Mean			61.3		20.75		26.125		
Dance	Female	Small	61	8	59	4	37.0	1	31
Dance	Female	Small	95	1	95	1	24.6	14	34
Dance	Female	Small	82	4	80	3	27.3	11	43
Dance	Female	Small	72	5	39	5	35.3	3	45
Dance	Female	Large	92	2	92	2	35.3	3	46
Mean			80.4		73.0		31.9		
Indoor Soccer	Female	Large	38	14	18	15	32.3	7	40
Indoor Soccer	Female	Large	53	11	23	12	31.6	9	42
Indoor Soccer	Female	Small	56	10	27	8	32.0	8	38
Mean			49.0		22.67		31.97		
Grand Mean			61.0		40.1		30.1		

APPENDIX G

RELIABILITY SCORES FOR JUDGES AND CODER

JUDGES EVALUATION SCORES FOR FIRST AND SECOND VIEWINGS
OF PHYSICAL EDUCATION LESSONS

Judge	1st View	2nd View
1	31	31
1	35	35
1	34	33
1	33	29
2	20	21
2	32	27
2	34	38
2	24	21
3	292	27
3	40	31
3	38	33
3	38	29

$$\text{Pearson } r = \frac{\sum XY - N\bar{X}\bar{Y}}{N\sqrt{\left[\frac{\sum x^2}{N} - \left(\frac{\sum x}{N}\right)^2\right]\left[\frac{\sum y^2}{N} - \left(\frac{\sum y}{N}\right)^2\right]}}$$

$$= \frac{11{,}724 - 12(32.3 \times 29.6)}{12\sqrt{\left[\frac{12{,}916}{12} - (32.3)^2\right]\left[\frac{10{,}791}{12} - (29.6)^2\right]}}$$

Pearson r = .75

Reliability for Judges = .75

CODER'S RELIABILITY WHEN ANALYZING ALT-PE

OBSERVATION SYSTEM

	Categories	SV^1	SV^2
Tape:31	D	50	50
	T	0	0
I.D.:	R	0	0
5 yellow	G	0	0
	GD	0	0
Activity;	P	0	0
Dance			
	W	3	4
	T	6	8
	M	3	2
	B	0	0
	N	0	0
	P	31	31
	S	0	0
	G	0	0
	F	0	0
	K	5	5
	B	0	0
	O	0	0
	N1	0	0
	NW	0	0
	NO	0	0
	M	31	31
	1	-	-
	C	5	5
	E	23	26
	M	13	10
	H	0	0

Pearson r =

$$\frac{5266 - 26\,(6.9 \times 6.6)}{\sqrt{26\left[\frac{5287}{26} - (6.9)^2\right]\left[\frac{5359}{26} - (6.6)^2\right]}}$$

r = .98

APPENDIX H

RAW DATA

PERCENTAGE OF ALT-PE AND ALT-PE(M)
FOR EACH STUDENT

Tape	Activity	Sex	% ALT-PE	% ALT-PE(M)
26	Basketball	M	52	27
26	Basketball	M	47	27
26	Basketball	M	59	28
26	Basketball	F	63	31
26	Basketball	M	47	24
27	Basketball	F	64	35
27	Basketball	M	44	25
27	Basketball	M	59	25
27	Basketball	M	59	35
27	Basketball	M	57	40
44	Basketball	M	67	28
44	Basketball	F	72	28
44	Basketball	M	69	27
48	Basketball	F	55	29
48	Basketball	F	61	37
48	Basketball	F	61	36
48	Basketball	M	56	33
48	Basketball	M	75	47
37	Indoor Soccer	M	48	12
37	Indoor Soccer	M	59	25
37	Indoor Soccer	M	52	20
37	Indoor Soccer	M	59	24
35	Indoor Soccer	M	89	16
35	Indoor Soccer	M	92	33
35	Indoor Soccer	M	75	21
47	Indoor Soccer	M	20	17
47	Indoor Soccer	M	23	16
47	Indoor Soccer	M	23	15
47	Indoor Soccer	M	19	13
47	Indoor Soccer	M	27	21

Percentage of ALT-PE And ALT-PE(M) for Each Student (Continued)

Tape	Activity	Sex	% ALT-PE	% ALT-PE(M)
31	Dance	F	47	40
31	Dance	F	71	63
31	Dance	F	71	64
31	Dance	F	71	63
34	Dance	F	93	93
34	Dance	F	96	96
34	Dance	F	97	97
43	Dance	F	72	71
43	Dance	F	85	84
43	Dance	F	84	83
43	Dance	F	85	84
45	Dance	F	71	36
45	Dance	F	77	43
45	Dance	F	65	37
45	Dance	F	76	41
46	Dance	F	91	91
46	Dance	F	95	95
46	Dance	F	88	88
46	Dance	F	95	95
40	Indoor Soccer	F	35	17
40	Indoor Soccer	F	48	23
40	Indoor Soccer	F	41	21
40	Indoor Soccer	F	27	15
40	Indoor Soccer	F	40	16
42	Indoor Soccer	F	56	23
42	Indoor Soccer	F	44	19
42	Indoor Soccer	F	61	31
42	Indoor Soccer	F	52	21
42	Indoor Soccer	F	51	24
38	Indoor Soccer	F	51	24
38	Indoor Soccer	F	64	29
38	Indoor Soccer	F	53	28

FREQUENCY OF OCCURRENCE FOR EACH CATEGORY OF BEHAVIOUR OF THE ALT-PE MODEL FOR EACH STUDENT

CATEGORIES:	Tape No. / Student	26 19B	26 11B	26 14y	26 6y	26 8B	27 7y	27 5B	27 7B	27 13B	27 10B	44 0y	44 19y	44 22y	48 7B	48 19y	48 11B	48 6B	48 6y
SETTING																			
Dir. Instruction	D	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Task	T																		
Reciprocal	R																		
Group	G																		
Guided Discovery	GD																		
Problem Solving	P																		
CONTENT GENERAL																			
Wait	W	5	4	7	4	5	6	5	5	5	3	6	5	5	3	3	3	3	2
Transition	T	15	15	12	13	17	2	5	4	4	2	7	9	8	15	15	16	13	10
Management	M																		
Break	B																		
Non Academic Inst	N																		
Practice	P	26	27	27	27	27	37	33	39	36	38	41	40	42	18	18	16	19	19
Scrimmage	S																		
Game	G	16	17	16	17	16													
Fitness	F						8	12	9	13	13				24	24	24	24	24
Knowledge	K	13	12	13	14	10	22	20	18	18	19	21	19	20	15	15	16	16	20
Social Behaviour	B																		
Other Motor	O																		
LEARNER MOVES																			
Not Engaged Interim	N1	2	2	2	1	1	2	6	4	7	3	2	1	1			1	1	1
Not Engaged Waiting	NW	7	6	6	5	9	9	5	7	14	9	4	2	5	6	6	6	5	6
Not Engaged off-task	NO	7	11	4	2	5	1		4	1	13	2	2					7	
Engaged Motor	M	20	22	23	23	21	33	21	33	27	32	23	23	25	32	31	30	29	38
Engaged Interim	1	9	10	9	10	10						10	12	10	1	2	1		2
Engaged Cognitive	C	10	5	12	17	7	22	14	18	18	13	20	19	21	18	18	18	17	16
DIFFICULTY LEVEL																			
Easy	E	39	35	44	47	35	48	33	44	44	43	50	54	52	41	48	46	42	56
Medium	M		2		3		7	2	7	1	2	3	1	4	10	3	3	4	
Hard	H																		
ALT-PE		39	35	44	47	35	48	33	44	44	43	50	54	52	41	46	46	42	56
ALT-PE(M)		20	20	21	23	18	26	19	26	26	30	21	21	20	22	28	27	25	35

FREQUENCY OF OCCURRENCE FOR EACH CATEGORY OF BEHAVIOUR OF THE ALT-PE MODEL FOR EACH STUDENT (CONTINUED)

CATEGORIES: Tape No. / Student		33 7B	33 13B	33 6y	37 13	37 4B	37 5y	37 0y	35 9	35 3	35 11	47 15B	47 10B	47 12W	47 12y	47 7y	40 1B	40 5B	40 12y	40 6y	40 7B
SETTING																					
Dir. Instruction	D	75	75	75	75	75	75	75	75	75	74	25	25	25	25	25	75	75	75	75	75
Task	T											50	50	50	50	50					
Reciprocal	R																				
Group	G																				
Guided Discovery	GD																				
Problem Solving	P																				
CONTENT GENERAL																					
Wait	W										1	2	1	3	3	3					
Transition	T	16	17	18	5	5	3	2	5	3	4	19	18	16	15	17	18	18	18	23	20
Management	M				8	8	15	16				4	6	6	7	5					
Break	B																				
Non Academic Inst	N																				
Practice	P	26	28	28	38	33	34	27	41	42	40	50	50	50	50	50	34	34	34	34	34
Scrimmage	S																				
Game	G								25	25	25										
Fitness	F	13	12	11	3	3	3	3									10	9	9	9	8
Knowledge	K	20	18	18	21	23	20	27	4	5	4						13	14	14	9	14
Social Behaviour	B																				
Other Motor	O																				
LEARNER MOVES																					
Not Engaged Interim	N1		2	1	5	5	5	2	1	2	2	11	1	5	2	3	1	1	1	1	2
Not Engaged Waiting	NW	17	17	15	2	1	2	1	1	1		24	30	23	25	23	24	14	22	25	18
Not Engaged Off-task	NO		1	1	10	3	5	9			7	1		3	9	4			1	1	
Engaged Motor	M	22	20	18	21	25	18	19	15	25	20	13	13	13	10	13	18	19	17	17	19
Engaged Interim	1		1	4	5	2	9	7	49	39	38			1				5	3		
Engaged Cognitive	C	20	17	18	19	23	18	19	4	5	2	2	5	5	4	7	13	14	12	8	15
DIFFICULTY LEVEL																					
Easy	E	42	34	38	38	44	41	44	67	69	56	15	17	18	14	20	26	36	31	20	30
Medium	M		4	2	7	6	4	1	1		4		1	1			5	2	1	5	4
Hard	H																				
ALT-PE		42	34	38	36	44	39	44	67	69	56	15	17	17	14	20	26	36	31	20	30
ALT-PE(M)		22	16	16	9	19	15	18	12	25	16	13	12	11	10	13	13	17	16	11	12

FREQUENCY OF OCCURRENCE FOR EACH CATEGORY OF BEHAVIOUR OF THE ALT-PE MODEL FOR EACH STUDENT (CONTINUED)

CATEGORIES: Tape No. / Student		42 11y	42 0	42 3	42 11B	42 4	38 5	38 7	38 10	31 5	31 11	31 7	31 6	34 7	34 8	34 5	43 0y	43 9y	43 8y	43 14y
SETTING																				
Dir. Instruction	D	75	75	75	75	75	75	75	75	72	72	71	73	75	75	75	75	75	75	75
Task	T																			
Reciprocal	R																			
Group	G																			
Guided Discovery	GD																			
Problem Solving	P																			
CONTENT GENERAL																				
Wait	W	7	5	6	6	4	3	3	3	5	5	5	6				10	10	9	8
Transition	T	7	7	8	6	10	12	13	17	7	2	5	3				1	1	1	1
Management	M		1							3	4	4	4							
Break	B																			
Non Academic Inst	N																			
Practice	P	21	20	24	23	25	26	28	28	52	53	52	55							
Scrimmage	S																			
Game	G																			
Fitness	F	12	12	13	13	14	14	13	12					75	75	75	63	63	64	65
Knowledge	K	28	30	24	23	22	19	17	15	5	8	5	5				1	1	1	1
Social Behaviour	B																			
Other Motor	O																			
LEARNER MOVES																				
Not Engaged Interim	N1			2	3	2	2	6	8								1			
Not Engaged Waiting	NW	18	12	10	11	12	15	1	4											
Not Engaged Off-task	NO		13	2	7	4	1				4		2	3	3	2	2			1
Engaged Motor	M	22	17	24	18	18	26	26	26	52	51	53	54	72	72	73	60	63	64	64
Engaged Interim	I						1	8	4											
Engaged Cognitive	C	21	19	23	23	19	19	18	15	5	6	4	4				1	1	1	1
DIFFICULTY LEVEL																				
Easy	E	42	33	46	39	38	38	48	40	35	53	53	53	70	72	73	55	64	63	64
Medium	M	1	3	1	2	1	8	4	5	21	4	4	6	2			6		2	1
Hard	H									1										
ALT-PE		42	33	46	39	38	38	48	40	35	53	53	53	70	72	73	54	64	63	64
ALT-PE(M)		17	14	23	16	18	18	22	26	30	47	48	47	70	72	73	53	63	62	63

FREQUENCY OF OCCURRENCE FOR EACH CATEGORY OF BEHAVIOUR OF THE ALT-PE MODEL FOR EACH STUDENT (CONTINUED)

Tape No.		45				46			
CATEGORIES: Student		1	10	14	12	2y	11y	5B	9B
SETTING									
Dir. Instruction	D	75	75	75	75	75	75	75	75
Task	T								
Reciprocal	R								
Group	G								
Guided Discovery	GD								
Problem Solving	P								
CONTENT GENERAL									
Wait	W	9	9	7	7	4	2	4	3
Transition	T	6	4	7	3		1	1	1
Management	M	2	2	2	2				
Break	B								
Non Academic Inst	N								
Practice	P	36	36	36	38				
Scrimmage	S								
Game	G								
Fitness	F					71	72	70	71
Knowledge	K	25	24	23	25				
Social Behaviour	B								
Other Motor	O								
LEARNER MOVES									
Not Engaged Interim	N1								
Not Engaged Waiting	NW	2							
Not Engaged Off-task	NO	1	1	7	5	1	1	3	
Engaged Motor	M	34	35	32	34	70	71	67	71
Engaged Interim	1								
Engaged Cognitive	C	21	24	20	24				
DIFFICULTY LEVEL									
Easy	E	53	58	49	57	68	71	66	71
Medium	M	1	1	3	1	2		1	
Hard	H								
ALT-PE		53	58	49	57	68	71	66	71
ALT-PE(M)		27	32	28	31	68	71	66	71

VITA

Surname: O'SULLIVAN Given Names: MARY MAJELLA

Place of Birth: LIMERICK,IRELAND Date of Birth: May 21, 1955

Educational Institutions Attended, with Dates of Entering and Leaving:

THOMOND COLLEGE OF EDUCATION, LIMERICK, IRELAND	1973 to 1976
UNIVERSITY OF VICTORIA, B.C.	1979 to 1980

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

B.Ed.(HONS)	1976	THOMOND COLLEGE OF EDUCATION LIMERICK, IRELAND

Honours and Awards:

Publications:

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Title of Thesis

A DESCRIPTIVE-ANALYTICAL STUDY OF STUDENT TEACHER EFFECTIVENESS AND STUDENT BEHAVIOUR IN SECONDARY SCHOOL PHYSICAL EDUCATION

Author 

MARY M. O'SULLIVAN

AUGUST 1980