

TEACHING BEHAVIOURS OF PRIMARY PHYSICAL
EDUCATION STUDENT TEACHERS

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by

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(Alberto CRUZ)

December 2002

ABSTRACT

TEACHING BEHAVIOURS OF PRIMARY PHYSICAL EDUCATION STUDENT TEACHERS

Alberto Cruz

The purpose of the study was to examine the teaching behaviours of Hong Kong physical education student teachers. Thirty-two local pre-service and in-service student teachers were videotaped teaching two ball games lessons in their own schools or in the allocated schools during their final practicum. Each videotaped lesson was coded using the Physical Education Teacher Assessment Instrument (PETA). Data generated by the PETA were comprehensively described and comparison was made between the two groups' behaviour categories by employing the independent t-test. Results indicated that the in-service group had significantly higher percentages of response presentation and total teacher instructional time than the pre-service group did, whilst the pre-service group spent significantly higher percentages of time in planned presentation, equipment management, activities organization, behaviour management and overall management time than did the in-service group. Six pre-service and in-service student teachers were randomly selected to participate in the second phase of the study. They were observed teaching two ball games lessons and were invited to take part in two pre-lesson interviews and two post-lesson stimulated recall sessions. Qualitative data were collected through lesson observations and interviews. Constant comparison and analytic induction were used to organize and categorize the data. Results showed that there were similarities and differences in teaching behaviours, teaching strategies and decision making during different stages of teaching between the two groups of subjects. Although the two groups of subjects held similar teaching beliefs and perceptions about physical education, they appeared to possess different teachers' knowledge of teaching. It was likely that the different teaching experience in physical education between the two groups accounted for the differences in their teaching behaviours. Findings of the present study hold implications for the preparation of physical education teachers.

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A.C.

List of Tables

Table		Page
1.	Summary of Findings of Studies of Cognitive Abilities and Teaching Behaviours Between Experienced and Novice Teachers	131
2.	Demographic Information of the Participants in the First Phase	202
3.	Demographic Information of the Pre-Service Participants in the Second Phase	210
4.	Demographic Information of the In-Service Participants in the Second Phase	217
5.	Percentages of Teacher Behaviour Time for the Thirty Two Student Teachers across all Sixty Four Lessons	219
6.	Percentages of Teacher Behaviour Time for the Pre-service Student Teachers across Forty Lessons	220
7.	Percentages of Teacher Behaviour Time for the In-service Student Teachers across Twenty Four Lessons	221
8.	Percentages of Teacher Behaviour Time for the Pre-service and In-service Student Teachers in Sixty-Four Lessons	223
9.	Responses Associated with Five Decision Paths During Interactive Teaching	253
10.	Number and Percentage Score for Interactive Decisions Taken By Student Teachers	254

Table	Page
11. Number and Percentage of Antecedent Thinking Decisions for Pathway Decisions as Reported by Pre-service and In-service Student Teachers	256
12. Comparison of Teachers Behaviours with American and British Studies	297

Table of Contents

	Page
Declaration	i
Abstract	ii
Acknowledgements	iii
List of Tables	iv
Table of Contents	vi
Chapter	
1. Introduction	1
1.1 Challenges to Teachers and Teacher Educators	1
1.2 Teacher Education and Effective Teaching	2
1.2.1 Teacher Education Programmes	8
1.2.2 Teaching Practice and Student Teaching	12
1.2.3 Developing the Teaching Skills of Student Teachers	18
1.2.4 Effectiveness and Experience	21
1.3 Hong Kong Institute of Education Context	25
1.4 Statement of the Problem	30
1.5 Significance of the Study	32
1.6 Aims of the Study	33
2. Review of Literature	36
2.1 Teacher Development	38
2.1.1 Teacher Development Theories	39
2.1.2 Summary	53

	Page
2.2 Teacher's Beliefs and Practice in Teaching	54
2.2.1 What are Beliefs?	55
2.2.2 Teachers and Their Beliefs	56
2.2.3 Developing Teachers Beliefs	61
2.2.4 Beliefs and Practice	62
2.2.5 Beliefs about Teaching Physical Education	67
2.2.6 Summary	69
2.3 Teacher Socialization and Teaching	70
2.3.1 What is Socialization?	71
2.3.2 Socialization into Teaching Physical Education	73
2.3.3 Summary	85
2.4 Participants of the Teacher Education Programme	87
2.4.1 Student Teacher	87
2.4.2 University Supervisor	89
2.4.3 Cooperating Teacher	91
2.4.4 Pupils	94
2.4.5 Summary	96
2.5 Effective Teaching	97
2.5.1 What is Effective Teaching?	102
2.5.2 Instructional and Management Skills in Physical Education	105

2.5.3	Time is a Variable in Effective Teaching	114
2.5.4	Summary	119
2.6	Expertise/Experience and Novice	121
2.6.1	What is Expertise?	121
2.6.2	What is Teaching Expertise?	123
2.6.3	What is Expertise in Teaching Physical Education and Sports?	125
2.6.4	Experience and Effectiveness	127
2.6.5	Summary	134
2.7	Teacher Knowledge and Teaching	135
2.7.1	Forms of Knowledge	136
2.7.2	Types of Teacher Knowledge	138
2.7.3	Developing Teacher Knowledge	143
2.7.4	The Importance of Teacher Knowledge	147
2.7.5	Summary	160
2.8	Overview of the Chapter	161
3.	Methodology	166
3.1	Research Questions	166
3.2	The Rationale of the Methodology	168
3.3	The Participants	172
3.4	Settings	174
3.5	Role of Investigator	176
3.6	Methods of Data Collection	178
3.7	Data Analysis	190

Page

3.8	Data Trustworthiness	192
3.9	Basic Assumptions	196
3.10	Limitations of the Study	197
3.11	Delimitations of the Study	198
3.12	Definition of Terms	199
3.13	Summary	200
4.	Results	201
4.1	General Description of the Participants	201
4.2	Analysis of Quantitative and Qualitative Results	218
4.2.1	How did the primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?	218
4.2.2	How did the pre-service primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?	220
4.2.3	How did the in-service primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?	221
4.2.4	Did the two groups of student teachers exhibit similar or different teaching behaviours?	222

4.2.5	Did the two groups of student teachers use similar or different teaching strategies in ball games lessons?	232
4.2.6	Did the two groups of student teachers make similar or different decisions in teaching ball games activities?	244
4.2.7	Did the two groups of student teachers have different beliefs and perceptions about physical education and teaching ball games lessons?	261
4.2.8	Did the two groups of student teachers possess different subject matter knowledge, pedagogical knowledge and pedagogical content knowledge regarding teaching ball games activities?	268
4.2.9	How did the student teachers' beliefs, perceptions and their thinking about physical education and teaching ball games lessons influence their teaching?	278
4.2.10	How did the student teachers' knowledge with respect to subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games lessons influence their teaching?	285
4.3	Overview of the Chapter	289
5.	Discussions and Conclusions	295

	Page
5.1 Teaching Behaviours of Student Teachers	295
5.2 Comparing Teaching Behaviours Between the Pre-service and the In-service Student Teachers	301
5.3 Teaching Experience and Reflection	307
5.4 Beliefs and Perceptions of the Two Groups of Student Teachers	309
5.5 Thought Process and Decision Making	313
5.6 Teachers' Knowledge	319
5.7 Implications of the Analysis	325
5.8 Conclusions	331
5.9 Recommendations	333
5.10 Overview of the Chapter	336
Bibliography	337
List of Appendices	
Appendix 1 Outlines of the Two Teacher Education Programmes	383
Appendix 2 Definitions of the Teacher Instructional and Managerial Behaviours Categories Coded by the Physical Education Teacher Assessment Instrument	385
Appendix 3 Instructions for Videotaping the Lessons	386
Appendix 4 Pre-lesson Interview Guides	387
Appendix 5 A Sample of Pre-lesson Interview of Sze	390
Appendix 6 Post-Instruction Interview Guides	397
Appendix 7 Stimulated Recall Interview Guides	399

	Page
Appendix 8 A Sample of Post-lesson Stimulated Recall Interview of Yung	400
Appendix 9 A Sample of Field Notes of Chu in Teaching Basketball	406
Appendix 10 Definition of Terms	409

Chapter 1

INTRODUCTION

Chapter one will serve as an introduction to the present investigation into the teaching behaviours of pre-service and in-service physical education student teachers. First, a summary of the challenges to teacher education in the new changing era will be presented. The influence of teacher education programmes on student teachers regarding learning to teach, the experience of student teaching and developing their teaching skills will be discussed. Second, the background of the Hong Kong Institute of Education and the reasons why the investigator developed an interest in this investigation will be provided. The research-problem statement will follow. A rationale and justification for the study will then be offered. Finally, the general research questions guiding the study will be presented.

1.1 Challenges to Teachers and Teacher Educators

There have been rapid economic and technological changes in the last two decades. These changes and advances have had great impact on our society. Everyone has to cope with this fast changing environment. These changes also apply to those working in the education sectors. There are greater demands and expectations on the education workforce. School teachers have to face new problems and challenges and they are required to take up new roles and responsibilities, including being a curriculum developer, teacher mentor, decision maker, and action researcher, etc. (Boles & Troven, 1996; Murphy, 1995). They are also expected to deliver quality performance in school and effective teaching in the classrooms. Education of school teachers relates to quality school

education. Consequently, teacher educators have great responsibilities for assuring the teaching quality of their graduates. They are under great pressure to equip student teachers with teaching competence for the new teaching environment. Although it is understandable that the major purpose of initial teacher training is to develop the fundamental teaching skills and abilities of student teachers, introducing the notion of effective teaching behaviours to student teachers has also become one of the essential tasks of teacher educators in the new changing era.

1.2 Teacher Education and Effective Teaching

The primary task of the teacher education institute is to prepare teachers to provide quality teaching in schools. Teacher education institutes usually offer campus training programmes and student teaching experiences for their students to cover the whole repertoire of teaching skills. Student teachers learn the basic pedagogical principles and reflective skills that help to develop further skills of teaching in the later in-service stage. It seems that teacher education is accountable for enhancing teachers' teaching effectiveness. This notion has been generally accepted among Hong Kong educators and school administrators. In the Review of 9-year Compulsory Education in Hong Kong, the Sub-committee of the Board of Education identified that teacher education is responsible for assuring the teaching quality of schoolteachers. They proposed that teacher education in Hong Kong should be strengthened in order to enhance teacher quality in producing effective teaching.

Professional education is crucial to teachers' performance and effectiveness in promoting pupils' learning. Knowledge and techniques such as

curriculum design, choice of teaching approaches, strategies for delivering the curriculum, handling pupils with emotional/behavioural difficulties, guidance and counseling service to pupils are all important.

(Sub-committee on Review of School Education, Board of Education, 1997, p. 47)

These factors all also apply to the field of physical education. If we want to improve the teaching performance of Hong Kong physical education teachers, the teacher education institute is responsible for equipping its graduates with skills that will produce effective teaching in physical education.

Preparing teachers to teach competently and effectively is one of the major objectives of the teacher education programmes. Then what is effective teaching? Effective teaching has long been a common research issue in the field of education. Educators have attempted to identify the characteristics of effective teaching. Research studies have provided a wealth of information regarding this issue in the past few decades (Brophy & Good, 1986; Dunkin & Biddle, 1974; Medley, 1977). From a synthesis of these research findings, Schempp (1992) pointed out that effective teaching is related to student achievement. He stated, "An effective teacher is one whose practices result in superior student achievement. In other words, the effective teacher is ultimately defined by what students learn" (p. 10). The investigator briefly introduces the definition of effective teaching here first and a more in-depth discussion on this issue will be explored in chapter two.

Although it is a fact that teaching is contextual in nature and the practice of an effective teacher cannot be copied and applied directly, educators are still interested in discovering the chemistry of effective teachers and have produced

lists of different qualities, dispositions, attributes and behaviours of effective teachers in their research studies (Brophy & Good, 1986; DfEE, 2000; OECD, 1994).

Indeed, the earliest studies into teacher effectiveness in 1920s and 1930s also concentrated in finding out 'what makes an effective teacher'. The results of these investigations merely indicated that good teachers were warm, caring and organized. Correlation studies were also common at that time as researchers attempted to seek link teacher characteristics to student learning outcomes. In all, no common characteristics were found among teachers who achieved good student outcomes as well as any correlations were noted between certain types of teacher characteristics and student achievements.

Educators shifted their attention to identify good practice of teachers and tried to understand what teachers actually did in the classroom in the 1960s. The idea of teacher behaviours affected learning began a new focus on teacher effectiveness research. This marked the change from surveys and correlation studies to descriptive and analytical studies located in the positivist research paradigm. Researchers assumed that they could discover causal relationships governing human behaviours by using objective observation (Dunkin & Biddle, 1974). During this time, a large number of observational instruments were developed to systematically describe what teachers and students were doing and what their relationships were like in the classroom (Darst, Mancini & Zakrajsek, 1983).

One of the first observational instruments was the development of the Flanders Interaction Analysis System (FIAS) (Flanders, 1960). The system was designed to describe and analyze teacher and student verbal behaviours. It was

the first time that the judgment of the teaching ability was based on observation of what was happening in real classroom situations. Cheffers (1973) adapted the FIAS for use with non-verbal interactions in physical education settings and developed the Cheffers' Adaptation of Flanders' Interaction Analysis system (CAFIAS). This was the first systematic observation instrument designed to record the interactions and behaviours of teachers and students in a physical education setting. Many researchers agreed that it was one of the most popular and acceptable for objectively observing both the physical education and coaching environment.

Another significant early descriptive research in physical education were initiated by Dr. William Anderson and his graduate students at Columbia University's Teachers College in 1971 called Teachers College Data Bank Project (Anderson & Barrette, 1978). This videotape data bank project was the very first to examine how teachers and students spend their time in physical education. These Data Bank investigations led to a series of research studies and contributed much to the knowledge base of teacher behaviours, student behaviours and the learning climate in physical education classes. The descriptive-analytic research was popular at this time as most physical education researchers were applying systematic observation instruments to describe events in physical education settings.

At about the same time, Dunkin and Biddle (1974) developed a process-product model for the study of teaching that provided researchers with a helpful framework for examining relationships and variables involved in the teaching and learning process, and linking those variables to student outcomes. A number of physical education researchers followed this line of investigation and

tried to relate teacher behaviours (process) to student achievement (product) in physical education lessons. These studies were often called process-product research or “teacher effective research”. The main problem in applying the process-product model in physical education was the difficulty of measuring student learning. In addressing this issue, physical education researchers adopted the concept of academic learning time in physical education (ALT-PE). They assumed that the ALT-PE is “a unit of time in which a student is engaged in relevant physical education content in such a way that he or she has an appropriate chance to be successful” (Siedentop, 1991, p. 25) and therefore is appropriate as a substitute variable for outcome measures. Process-product research continues today, the interests of physical education researchers are highly specialized and diverse. Examples of these diverse topics are teachers knowledge, students thought processes, curriculum development and etc. Some researchers even adopt a modified process-product design in their studies on academic learning time. As the body of descriptive analytic and process-product research on teaching physical education began to accumulate, it helped us understand more about the complexity of teaching physical education and effective teaching in physical education settings. In chapter two, the investigator will provide a more in-depth review on effective teaching behaviours in physical education.

In the field of physical education, there are quite a number of studies on teaching effectiveness in the past few decades. Most of these studies rest heavily on making generalization from the findings in classroom research and applying them to the physical education setting. Results of these studies have been similar to those revealed in classroom research. Siedentop and Tannehill (2000) point out that the research on effective physical education teaching confirms that the

strategies that produce differentially higher learning outcomes in the classroom are also those that do so in the gymnasium. An effective physical education teacher is no different to an effective classroom teacher as described by Brophy and Good (1986). He or she should make a difference with students, develop a management system that helps students stay on task, plan and implement an instructional programme that can motivate students and hold them accountable for performance. All instructions should be done within a supportive and respectful class climate. The effective physical education teacher can create and sustain a total learning environment for their students (Rink, 1996).

Recently, Whipple and Ammah (2001) have suggested that managerial and instructional competencies are the two major teaching effectiveness criteria for physical education beginning teachers. In practice, managerial strategies are the prerequisite procedures for a teacher to create an environment where instruction and learning can take place. Ineffective and insufficient managerial skills demonstrated by teachers may contribute to unsuccessful lessons. Instructional strategies refer to actions that promote student learning. They are usually goal oriented and associated with the specific objective of the lesson. In essence, effective physical education teaching is highly related to proper managerial strategies, a positive learning environment, good instructional strategies and student achievement. Thus, physical education teacher education programmes are designed to develop teachers with both managerial and instructional competencies to create a positive learning environment in the physical education setting.

1.2.1 Teacher Education Programmes

There are two indisputable facts in teaching. First, no one is born to teach. Second, everyone needs to learn and possess certain skills and knowledge in order to teach effectively. Teacher education is the vehicle by which individuals learn their skills and knowledge in teaching.

The findings generated by the positivist research tradition had a great impact on the process of teacher education. As educational positivists sought to discover those teacher behaviours and instructional patterns that were “effective” in producing student learning, they argued that, once identified these behaviours and patterns should be transferred directly for use in teacher preparation programmes. Teacher preparation programmes were thus dominated by an emphasis on direct training in specific and observable teaching skills. This kind of teacher preparation can be described as a kind of teacher training as it signifies a behaviourist training approach. It was argued that the development of this skills-led approach would ensure the student teachers develop appropriate skills and competencies relevant to the needs of children and the schools. Indeed, most teacher educators oppose this approach as it neglects the fact that the teaching is a complex activity in which the personal judgment and values of practitioners are called into play. It also ignores the promotion of the kind of reflection, which encourages the critical evaluation of practice in terms not only of its effectiveness but also its appropriateness for educational purposes. Therefore, traditional teacher education would include the learning of educational theory as well as the acquisitions of the teaching skills and competencies, whereas the educational theory will help to provide insights into the broader educational and social issues that are faced by the pupils the student teachers teach and

encourage critical reflections in a wider perspective.

Based on the rationale of progressive development of teaching capability, competence, and the expertise of student teachers, most teacher preparation programmes provide professional courses and student teaching experiences to help their students develop professionally. Their ultimate aim is to help student teachers to become totally independent learners who can be adaptable to complex school environments. The professional courses offered, such as curriculum, instructional design and method courses, are usually integrated with the design of the student teaching experiences. These education courses are traditionally the means through which the student teachers learn the theoretical principles, knowledge and skills necessary for good teaching (Zeichner & Gore, 1990). It is expected that through these training programmes, student teachers will develop into competent novice teachers. Cooke and Pang (1991) demonstrated the effects of the teacher training programme on beginning teachers in their study. They focused on 129 'trained', 'partially trained' and 'untrained' beginning teachers in Hong Kong, where graduates may enter teaching without training. They found that the trained beginning teachers appeared to have fewer problems and adjusted better during the first year of teaching than did the other two groups.

Some educators argued that these professional courses had little influence on the subsequent behaviours of teachers, and that teachers in the field depend on practical remedies rather than theoretical bases (Crow, 1986; Katz & Raths, 1982). Perhaps possessing theoretical knowledge alone does not benefit student teachers much in their teaching explicitly. Dale (1977) was one of the first to point out the socialization effect of teacher education and claimed that the chief impact of initial training came through the hidden curriculum of teacher preparation

programmes, instead of the formal knowledge and skills imparted to teachers. Other educators support this view and underscore the importance of the socialization effect within the training programme (Ginsburg, 1984, 1985; Popkewitz, 1985). They maintain that the real impact of pre-service preparation lies in how the images of teacher, learner, knowledge, curriculum, and professional behaviours are communicated to prospective teachers through the covert processes of the hidden curriculum of the teacher education programmes. Indeed, evidence has shown that student teachers improved their teaching if they had the opportunity to put their learnt knowledge into action by proper means in the teacher training programmes.

In the field of physical education, Graham (1987) underscores the influence of physical education teacher education in a conference meeting and states that coursework, early field experiences and student teaching are the three influential events that help to develop student teachers' teaching skills within the physical education teacher education programme. Researchers have indicated that methods courses do benefit student teachers in some way. Student teachers exhibited more effective teaching behaviours after attending a method class that included teaching experience and time for reflection afterwards (Curtner-Smith, 1996; O'Sullivan & Tsangaridou, 1992). Student teachers also believed that the opportunity to put learnt theory into practice was more beneficial to them than just teaching or just learning theory.

Ashy and Humphries (2000) showed that twenty four pre-service elementary teachers appeared to have increased their physical education teaching skills after taking a physical education methods course, followed by field experience involving teaching physical education with reflective assignments. They

demonstrated that professional courses linked with student teaching experiences are effective in helping student teachers learning to teach.

Dodds (1989) contends that the opportunity given to student teachers to practise all their learnt theoretical knowledge is important in the process of teacher preparation. Byra and Sherman (1993) showed that the more experienced pre-service teachers possessed better decision-making strategies for lesson planning than their less experienced counterparts. It seems the more opportunities that student teachers have to apply theory to practice, the more beneficial it is to them rather than just teaching or just learning theory.

Physical educators continually provide supporting evidence that physical education teacher education programmes may exert an impact on physical education teachers' biographies and practices. Curtner-Smith (1998) investigated the influence of one university's core physical education teacher education (PETE) programme on the perspectives and practices of two first-year elementary school teachers and how this influence was mediated by the teachers' biographies and entry into the workforce. Data results indicated that the elementary physical education teachers tried to innovate the physical education programmes at their schools despite receiving poor quality physical education themselves and entering PETE with coaching orientations. These practices might be due to the influence of their teacher education programme.

Woods and Earls (1995) also indicated that PETE program exerted influence on their physical education graduates. By studying the educational beliefs and teaching practices of six physical education teachers who were recent graduates of a major southern university in the United States, they showed that the teachers had incorporated many of the skills and beliefs which had been demonstrated to them

as undergraduates into their in-service teaching. It is apparent that the teacher education makes a difference to student teachers.

Nevertheless, criticisms were in fact received about some physical education teacher programmes (Locke & Dodds, 1984). Locke and Dodds indicated that some physical education teacher education programmes in some American colleges did not function effectively in a national conference. The physical education scholars attribute the ineffectiveness of these programmes to the absence of systematic training procedures to help teachers acquire specific teaching skills (Locke, Mand & Siedentop, 1981; Siedentop, 1986). Research studies have revealed that by giving sufficient specificity and appropriate contingencies via a number of training strategies, teacher education programmes could be improved and become more effective (Siedentop, 1986; Taggart, 1988). This implies that teacher education programmes need to be carefully designed and systematically implemented according to their goals and purposes in order to maintain their effectiveness.

1.2.2 Teaching Practice and Student Teaching

Teaching practice and student teaching have long been recognized by educators and described as the most important elements within the teacher education programme (Coulon, 1991; Paese, 1984a; Siedentop, 1981; Tannehill & Zakrajsek, 1988). Teacher education institutes design courses to provide a supportive student teaching environment for their students learning to teach. The strategies provided range from mentoring to cooperative teaching and learning. Learning activities include lesson analysis, microteaching, classroom observation, peer teaching, cooperative lessons and participation in non-teaching activities.

Many pre-service teachers believe that student teaching is the principal and the only 'real' learning experience of their teacher education programme (Amarel & Feiman-Nemser, 1988). After studying the views of two pre-service teachers on their practicum and professional coursework, Geddis and Roberts (1996) reported the two student teachers claim that they learned more about teaching in their practicum than in the professional preparation courses in their study. Although these are only the subjective views of two student teachers and cannot be generalized to other student teachers, the finding is noteworthy in that it focuses on case studies, and allows a detailed consideration of how these student teachers felt in the light of practical concerns they faced during teaching practice.

In practice, student teaching has provided opportunities for student teachers to work with pupils and schoolteachers as well as school administrators. With these learning opportunities, student teachers can critically examine whether theories learned in the coursework fit into the actual teaching situations. Educators assert that student teaching in fact offers a chance for student teachers to evaluate their teaching capabilities and the relevancy of their teacher education programmes (Alexander, 1982; Goodman, 1986).

Similarly, many physical education scholars share the same view that student teaching is essential to physical education student teachers' training (Dodds, 1985, 1989; Mitchell & Schwager, 1993; O'Sullivan, 1990; Schempp, 1989) because this first experience helps them to get familiar with the genuine situation of the school setting in physical education. Placek and Silverman (1983) called for better planning between universities and schools in placing early field experience for student teachers after finding the physical education student teachers were only offered a limited hours of teaching during their early field experience in a

survey of 100 American colleges and universities in 1983. They maintain that the student teaching experience is one of the major training ways for student teachers to learn teaching in physical education. Student teaching provides student teachers with the initial chance to understand what real physical education teaching in school is. O'Sullivan (1996) also identified these 'clinical' experiences as an important component of quality teacher education programmes.

Providing classroom experience is critical to the development of the teaching skills of physical education student teachers. Physical educators have reported that student teachers improved their teaching skills after planned student teaching experience in their studies (Gusthart & Rink, 1983; Taggart, 1988). In his study Ojeme (1984) found that pre-service teachers develop their teaching related abilities and skills during their student teaching. The pre-service teachers learn skills of developing a lesson plan, techniques of content knowledge delivery, methods of classroom management and discipline, skills of pedagogy and ways to evaluate teaching and learning processes. The findings of the study substantiate the contribution of student teaching to student teachers.

In addition, research evidence has indicated that actual experience could help student teachers improve their levels of confidence in teaching. Doeblner and Rooberson (1987) found that student teachers become more comfortable with the subject matter, their teaching performance, and the students as they proceed through the experience. Other educators also support this view. While studying the influence of student teaching in the teacher socialization process in an elementary school programme, Tabachnick and Zeichner (1984) showed that student teachers become more positive regarding their positions, their classroom management ability and the evaluations of the cooperating teacher after gaining

more teaching experience.

Brown, Collins and Duguid (1989) have demonstrated how conceptual knowledge is both situated and progressively developed through activity. Therefore, in the context of a specific classroom, students' knowledge of both what and how to teach is developed by the actual experience of teaching. There is no separation between 'knowing' and 'doing' in that situation. Without this authentic experience student teachers may not understand how the theories relate to the teaching activities, as they have no opportunity to use them and reconstruct their own knowledge. Mawer (1996) has provided more supporting evidence when studying 50 primary education student teachers from one institution. He found those who had a limited experience of observing and teaching certain physical education teaching activities felt under-confident about teaching them. More professional experience opportunities may enhance student teachers' confidence in teaching.

One must be aware that raising the level of confidence may not relate to teaching competence. Gooday, Payne and Wilson (1993) reported that four-year primary student teachers were considerably more confident about teaching science than their first-year counterparts, yet in the understanding of scientific concepts there was no difference between the two groups. Despite this note of caution, building student teachers' confidence may enhance their perception of themselves as teachers. They feel confident to use their imagination and try original ideas. This in turn may help them to be creative and innovative in class teaching (Rolfe, 2001).

Experience in teaching may help student teachers be more sensitive to students' learning and become familiar with classroom environments. With time

student teachers tend to understand and be more aware of the theoretical applications behind the classroom activities (Fisherman & Raver, 1989).

“With-it-ness” regarding the classroom and gymnasium generally develops and advances through the student teaching process (Doebler & Rooberson, 1987).

In order to equip student teachers with skills and knowledge for effective teaching performance, educators underscored the importance of matching the student teaching experience with campus training programmes (Applegate & Lasley, 1982; Cruickshank & Armaline, 1986).

Overall, both pre-service and in-service teachers consistently contend their student teaching is the most important and useful aspect of professional preparation (Johnson, 1982; Locke, 1984; Zeichner, 1980). However, some research evidence showed that the student teaching experience might have no influence on student teachers. Johnston (1994) reported that there existed little understanding of how the school experience contributed to the process of learning when she analyzed the role of school experience of eight primary and early childhood student teachers. Other educators also agree that increased school experience alone does not always benefit the student teachers (Armaline & Hoover, 1989; Feiman-Nemser, 1983; Griffin et al., 1983). Studies showed that student teachers spend little time actually teaching and rarely have a chance to plan or develop curriculum (Bowyer & Dyke, 1988; Placek & Silverman, 1983). They have not much opportunity for practical teaching experiences. Such experiences may cause damaging effects by leading them to learn things that are inappropriate in any teaching situation (Feiman-Nemser & Buchmann, 1986).

In physical education, Templin (1979) pointed out that student teachers promptly reject behaviours learned in their programme and become more

custodial during their student teaching experience. This research, though carried out over 20 years ago, is still important because he was one of the first physical education scholars pointed out the effects of the workplace to physical education student teachers. Graham (1991) even showed that there was a negative shift in student teachers' attitudes toward pupils, discipline, and teaching as they proceeded through the practicum. Feiman-Nemser and Buchmann (1986) and Dodds (1985) gave the reason for this that most classrooms are not intentionally set up for the training of teachers and only part of the job of teaching is learned through field experience. It is possible the student teachers do not learn well during their student teaching experience. Some educators acknowledge the importance of the student teaching experience within initial teacher education but it does not automatically bring about good results (Berliner, 1985; Metcalf, Hammer & Kahlich, 1996).

Field experiences can be misinterpreted if they are poorly structured and not properly supervised. There are strong reasons to believe that the fieldwork experience within the aforementioned studies that reported negative effects on student teachers was not well organized and unstructured. In that case, the influence of the school experience on student teachers can be weak and contradictory. Jones (1992) provided evidence how field experience affected student teachers' decision on their career choices in his study. He reaffirmed the importance of careful site selection for field experiences, appropriate training of cooperating teachers for the role as teacher educators and specially designed opportunities for student teachers to be debriefed on their teaching practice. Perhaps only well constructed field work experience can produce positive effects on student teachers with regard to the learning to teach process. No wonder

O'Sullivan and Tsangaridou (1992) commented that developing teaching skills takes time and careful planning. The development of student teachers into teachers does not occur overnight. They need to practise many hours in the setting of the classroom to become successful.

1.2.3. Developing the Teaching Skills of Student Teachers

Student teachers are expected to develop their basic teaching skills during student teaching experience. In reality, the student teachers may not capture expected pedagogical skills. They may encounter certain difficulties during their student teaching. Research evidence stresses the problems for developing pedagogical skills in student teachers. Stones (1983), one of the early educators pointed out the mismatched pedagogy between teacher educators and schoolteachers and cited lack of communication and misunderstanding between the cooperating teachers and supervisors as a major deficiency in some teacher education programmes. The learning of theory in the teacher education programme was impractical when applied to teaching in schools. There might be incongruence between the pedagogy introduced in teacher education programmes and the practice that take place in the school settings (Rikard, 1990). Paese (1984b) added that some cooperating teachers might lack pedagogical knowledge in helping student teachers. Eventually, the student teachers would gain little benefit and negligible change in the development of their pedagogical skills.

Physical educators have made several recommendations for improving the learning of student teachers during the student teaching experience (Paese, 1984c; Rolfe, 2001; Stones, 1983). They suggest university supervisors should review

their role in relation to the student-tutor relationship instead of acting as evaluator. The university supervisor should take up the role of the cooperating teachers if the cooperating teachers do not possess the expertise in teaching skills. It is assumed that the university supervisor bears the requisite proficient teaching skills. The student teachers would benefit more if there were better communication between the cooperating teacher and supervisor and stronger links between schools and the teacher education institute. It seems that different participants within the teacher education programme will influence the student teachers in learning to teach. The investigator will present a more detailed review on the roles and influences of these participants on student teachers in chapter two.

Educators agree that teacher education programmes cannot prepare student teachers for encountering every situation, nor can the program provide teachers with all the knowledge and strategies they need for their teaching, so it is preferable to help them become effective decision-makers who are able to translate pedagogical knowledge into practice (Berliner, 1985; McNamara, 1990; Shulman, 1987; Zeichner, 1986a, 1987). Tinning (1988) proposed that the student teaching experience should be conducted within the critical-inquiry perspective as a viable alternative to the tradition that emphasizes the development of technical expertise. He emphasized that this approach would develop the student teacher into a critical and reflective physical educator with regard to their teaching. Some argued that reflection was the essential element of good teaching (Elbaz, 1988; Richert, 1991), educators requested and called for the use of reflective practice at both the pre-service and in-service professional training in teaching education programmes (Clarke, 1995; Schon, 1991; Zeichner, 1991). The critical-inquiry perspective appears to be an essential element of

student teaching in teacher education programmes.

As teaching is a complex activity requiring teachers to make a series of decisions based on the students and the teaching contents, it is not a simple task for student teachers. Despite involving them in a complex environment, there is no “magic bullet” to guarantee effective teaching in the classrooms. This is especially true of student teachers during their student teaching. From the experience of the investigator who works as a physical education teacher educator in the Hong Kong Institute of Education, I always observe incompetent teaching performances in final year primary physical education student teachers during their teaching practice. Most student teachers cannot manage the class and deliver the teaching content properly with relation to the student learning objectives stated in the lesson. They do not yet have a real sense of their ability to change or respond to the flow of the classroom events. They seem to be unfamiliar with the complex classroom environment and their classroom instructional and managerial skills are ineffectively demonstrated. Having little experience with real situations, they rely on the rules of teaching they have learned in their teacher preparation programme. These teaching characteristics are indeed quite similar to those of the novices described by Berliner (1988a) in his five-stage theory of learning to teach. They are very rational, relatively inflexible, and tend to conform to whatever rules and procedures they are told to follow. According to Berliner, student teachers will display the characteristics, and experience the needs, of the first two of five stages (novice, advanced beginner, competent, proficient, and expert). With more experience, more advanced stages will be attained. It seems that the initial problem of the primary physical education student teachers lies in their insufficient student teaching

experience. Working as a teacher educator, I feel that I have responsibility to find out the real reason there are such unsatisfactory teaching performances given by the physical education student teachers.

1.2.4 Effectiveness and Experience

School experience has been aforementioned as one of the essential components in teacher training programmes. Dodds (1989) suggested that school experience would provide student teachers opportunities to observe and learn how to teach in schools. By this school experience, student teachers would develop and acquire their teaching skills progressively. In a later stage, student teachers continuously learn their teaching by accumulating actual teaching experience in the workplace after they graduate. It seems that classroom experience helps teachers learning to teach. Educators argue that all teachers with years of experience could, and would, become proficient, or even expert in teaching (Bell, 1997; Berliner, 1986; Siedentop & Eldar, 1989). It takes a long period of time and substantial experience to become expert. There is no short cut to the development of expertise in pedagogy. Ward and O'Sullivan (1998) further add that experience is a necessary condition for developing both competence and expertise. Acts of reflection, mentoring by others, professional development and contextual factors are embedded in experience which serve to shape the behaviours of the teacher.

Berliner (1988a) has argued that experience is an important component of expertise and has proposed five stages of learning to teach and the development of teachers based on those stages suggested by Dreyfus and Dreyfus (1986): 1) novice, 2) advanced beginner, 3) competent, 4) proficient and 5) expert.

Learning to teach should be viewed as a set sequence of stages in the accumulation of domain-specific knowledge. One who learns to teach is expected to go through each stage. Later stages will not be achieved until earlier ones are mastered. Teachers take some time to develop from one stage to another. Berliner (1989) posits that teachers move from novice to later stages of expertise primarily due to the experience they gain as they develop both episodic and strategic knowledge. In this model, experience helps beginning teachers move towards the second and perhaps even the later stage of expertise. Most likely, it is reflected-upon experiences that move teachers beyond the stage of expertise. As some never learn much from their experience, experience is a necessary but certainly not a sufficient condition for expertise. Berliner (1987a) pointed out that many have accumulated years of relevant kinds of experience but seem not to have profited from it. If they could remain motivated and reflective they are likely to be transformed by their experience into expert teachers.

Criticos (1993) also supports the ideas that learning does not emerge simply from experience. Experience has to be arrested, examined, analyzed, considered and negated to shift it to knowledge. It appears that in the process of reflecting on one's experience, cognitive changes occur in the ways information is processed. Schemata will eventually develop and new professional knowledge be created. Teachers with more experience will have different schemata to those who have less experience. The investigator suspects that Berliner would agree that through relevant domain-specific experiences, beginners acquire both knowledge and expertise. In other words, experience seems to be a predominant element in effective teaching. Kolodner (1983) has argued that there is a relationship between experience and expertise. She describes the evolution from novice to

expert:

When a person has only gone to school and acquired book knowledge, he is considered a novice. After he has experience using the knowledge he has learned, and when he knows how it applies both to common and exceptional cases, he is called an expert...Experience serves to turn unrelated facts into expert knowledge. (Kolodner, 1983, p. 498)

Overall, Ferry and Ross-Gordon (1998) conclude, “the key to expertise does not seem to reside in merely gaining experience, but in how the individual uses experience as a learning mechanism” (p. 107). Thus, there is a difference between making time to engage in the acts of teaching and actually gaining knowledge from this experience in learning to teach.

Researchers have been interested in studying the relation between the element of teaching experience and teaching effectiveness. Several studies were conducted to examine classroom teachers over a long term period, however, the findings were inconclusive (Adams, 1982; Ayers, 1986; Mays, 1989).

Researchers of some socialization studies have demonstrated that the effects of the workplace have changed teacher effectiveness in physical education (Arrighi & Young, 1987; Placek, 1984; Schempp, 1986; Templin, 1979, 1981). Zeichner and Tabachnick (1981) attribute these “wash out effects” of teacher education to the graduates confronting the reality of the workplace. Dodds (1994) concluded that the school’s teaching environment might influence the teaching competency of physical education teachers. In other words, school teaching experience has influential effects on teaching behaviours.

In addition, researchers have found that there are differences in cognitive and teaching behaviours between experienced and novice teachers (Levin, 1993;

Mostert & Nuttycombe, 1991; Yon, 1991). Similar findings can also be found in the field of physical education. Experienced teachers had better performance than novice teachers (Fortin, 1992; Graham, French & Woods, 1993; Graham, Hopple, Manross & Sitzman, 1993; Griffey & Housner, 1991; Housner & Griffey, 1985; Phillips & Carlisle, 1983; Stroot & Morton, 1989; Van der Mars, Vogler, Darst & Cusimano, 1995).

Recently, Tam (1997) compared the instructional activities of trained/experienced teachers and untrained/less experienced teachers in the Hong Kong school classroom setting. He indicated that experienced teachers had better teaching and management skills than less experienced teachers even though they had similarities in their approach to teaching. Tam suggested that training and experience did produce relatively more effective teaching behaviours.

Ha (1996) also examined teachers' behaviours in a Hong Kong secondary school physical education setting. She compared the teaching feedback pattern of forty pre-service and in-service teachers by using the Self-Assessment Feedback Instrument (Mancini & Wuest, 1989). Results showed that the in-service group had a significantly higher percentage of using the teaching feedbacks of praise, praise/re-instruct and questioning than the pre-service group. She concluded that teachers with more experience seemed to attend to more information which would be used to deal with more details when teaching. It is possible that teaching experience could account for the difference in teaching behaviours between pre-service and in-service teachers.

Results of teacher knowledge studies also support the notion that effective teaching demands time and experience. By investigating how people learn to teach, Rosenberg (1990) asserted that experienced teachers, whether trained or

untrained, had a more elaborately developed sense of pedagogical content knowledge. Another study conducted by Ennis, Mueller and Zhu (1991) focusing on the development of declarative knowledge of pre-service teachers, had results suggesting that the declarative knowledge of the pre-service teachers increased as a result of coursework and practical teaching experiences. Dodds (1994) pointed out that sophisticated schemata could not be highly developed, richly detailed and interconnected at the beginning of the development of the teaching process, thus, less experienced teachers could not teach and plan as effectively as their experienced counterparts.

On the whole, the research findings are mixed and inconclusive, a more detailed review on the issue of instructional experience and effective teaching will be presented in chapter two. Anyhow, it seems that having more field teaching experience may alter the pedagogical knowledge and teaching behaviours of a teacher. If this assumption is true, there should be different teaching behaviours patterns between in-service and pre-service student teachers since the in-service group has more field teaching experience.

1.3 Hong Kong Institute of Education Context

The Hong Kong Institute of Education (HKIED) is a tertiary teacher training institution established in 1994 by uniting and upgrading the former five Colleges of Education in Hong Kong, as recommended by the Education Commission (1992). These were the Northcote College of Education, the Grantham College of Education, the Sir Robert Black College of Education, the Hong Kong Technical Teachers' College and the Institute of Language in Education. The Hong Kong Institute of Education is charged with the mission of improving the

quality of teacher education at all levels in Hong Kong.

Acting as the major teacher education provider in Hong Kong, it is distinguished from other tertiary institutions by having only one prime institute objective: to produce competent teaching professionals who can contribute effectively to Hong Kong schools and the learners within them. The institute offers various types of teacher education programmes. These include pre-service and in-service with full-time and part-time modes covering pre-primary, primary and secondary levels with Certificate in Education programmes, Bachelor of Education programmes, Postgraduate programmes and Further Teacher Education programmes.

As the Hong Kong Institute of Education is a newly established teacher education institution, its public image is important to the stakeholders. Every year student teachers of the institute are sent to primary and secondary schools for their teaching practice as part of their field experience. Hence, field experience represents the public face of the effectiveness of the institute. Demonstrating success in this area is vital to public confidence in the institute as well. On the other hand, failure or poor performance in this area would certainly damage its reputation. This demand places considerable requirements and stress on institute staff members. They need to monitor their student teachers closely during periods of teaching practice in order to help them achieve desirable teaching practice performance in schools. Working as institute supervisor, I face the same problem. I always need to pay additional visits and offer encouraging advice and support to my assigned physical education student teachers.

Previously the institute acted as a major primary teacher training provider and offers most of the primary school teachers training programmes in Hong

Kong. Over two thirds of the student teachers in the institute are pursuing primary education programmes. I usually find the teaching performance of the primary physical education student teachers in the pre-service programme are far from satisfactory in relation to their instructional techniques and classroom management during their teaching practice. They seem to bear the teaching characteristics of the novices as described by Berliner (1988a) in his five-stage theory of learning to teach. Although they all got a pass grade for their teaching practice performances, most of them received negative comments from their institute supervisors. However, according to my observation, this is not so much of a problem for the physical education student teachers in the In-service Course of Training for Teachers in Primary Schools during their teaching lessons. Most in-service final year primary physical education student teachers teach and manage the classes more competently when compared to their pre-service counterparts. They usually bear the characteristics of the advanced beginners or competent performers suggested by Berliner (1988a) and have advanced into these stages. Most of them received good grades and positive comments from their supervisors during the teaching performance assessments. The overall impression is that they seem to have better teaching performances than full-time student teachers.

When comparing the programme goals, course works and structure of the full-time and in-service programmes in primary education, they are similar and can be argued to have no major differences. Both groups of physical education student teachers need to pass an admission test before being admitted to the programmes. The test includes assessments on student teachers' physical fitness level and interview screening. Both programmes aim at preparing graduates to

become qualified primary school teachers and obtain “Qualified Teacher Status”. The programmes are designed to equip student teachers with necessary skills and knowledge to teach physical education competently in primary schools in Hong Kong. As the duration of these two programmes are comparatively short, they are the fastest tracks that student teachers can become qualified physical education teachers in Hong Kong. Due to the limited contact time in the programmes, technocratic teaching dominates the contents and mode of teacher education training in physical education.

Besides, the course structures of the two programmes are similar and each consists of five domains. The five domains in the full-time pre-service programme are curriculum studies, academic studies, professional studies, general education and field experience. While the domains of the part-time in-service programme are made up of primary studies, elective studies, professional studies, general education and practicum. When comparing the modules offered in the five domains, the core contents of the modules are identical. For the interest of the present study, the investigator compares the physical education modules offered in the two programmes. The modules offered in the full-time pre-service programme are also provided in the part-time in-service programme. They are the “Physical Education Curriculum”, “Teaching Techniques in Physical Education”, “Sports Science”, “Skills Proficiency I”, “Skills Proficiency II” and “Skills Proficiency (Lower Primary)”. Besides, I also find that the staff members teaching these modules offered by the two programmes are identical. Although the contact hours of the in-service programme are comparatively less than those in the pre-service programme, I believe the teacher education training of the physical education student teachers in two programmes is not much

different. The only difference between the two programmes is the mode of field experience offered (Glenwright, 2001). The field experience of the full-time programme is conducted within block teaching practices, having relatively limited time in school and suggesting a theory to practice model that is both linear and technocratic. On the other hand the unqualified student teachers in the in-service programme have to teach daily in their schools and learn to teach in an 'on the job' environment. It seems the difference in field teaching experience may be one of the factors that contributes to the difference in teaching performance between the two groups of student teachers. Moreover, readers need to be cautioned that the two groups of student teachers might bear different academic achievements, life experience and attitudes before they started their teacher education programmes. I assume that their training within the teacher education programmes will keep their discrepancies to the lowest. The different characteristics, such as beliefs and knowledge about teaching, between the pre-service and in-service student teachers may also contribute to the differences in their teaching behaviours. This eventually aroused my interest to study the teaching behaviours of the student teachers as to understand what is happening during their teaching practice.

The investigator had to choose a teaching activity to study. The teaching content chosen for the student teachers was ball games activities. Games activities were chosen because they had occupied a significant part in the primary physical education curriculum. It dominates and receives a disproportionate allocation of time within the physical education curriculum (Curriculum Development Council, 1995; Turner & Martinek, 1995; Werner & Almond, 1990; Williams & Jenkins, 1988; Williamson, 1982). Besides, games activities have

been well received and preferred to other physical activities by school children (Dickenson & Sparkes, 1988; ILEA, 1988; Scott & West, 1990). They are the popular teaching activities of primary physical education lessons.

Lastly, the interest in student teachers' teaching ball games lessons comes out of my career experiences. While teaching ball games in the teacher education institute, I work closely with student teachers. I find some student teachers have difficulties in teaching ball games during their teaching practice. What are their major problems? My career experiences also convinced me that teaching behaviours are different between pre-service and in-service student teachers in ball games lessons. Do they encounter different problems while teaching and preparing the ball games lessons? What factors contribute to these differences? I then began to look into these questions within the framework of instruction and management behaviours to determine whether differences exist, what the differences are, and what, then, are the implications for preparation of teacher education students. I became interested in understanding the teaching behaviours of student teachers in teaching ball games activities. It is hoped the data generated in the present study will provide a clearer understanding of what is going on in the ball games lessons.

1.4 Statement of the Problem

The major task of the teacher education institute is to produce competent teachers. Teacher educators help to assure the teaching quality of the graduates. Working as a teacher educator in an institute of education, I find that teaching performances of final year pre-service primary physical education student teachers during teaching practice are slightly different from the teaching

performances of final year in-service primary physical education student teachers. It seems that the different modes of teaching practice in different programmes lead to the different teaching performances of the student teachers. Although the status of the student teachers of both the in-service and pre-service training programmes are assumed to be equivalent when they graduate, according to the investigator's subjective impression, the two groups of student teachers seem to possess different teaching abilities. Do the in-service student teachers teach better than the pre-service student teachers? Is the mode of teaching practice in the in-service teacher training programme more effective than that of the pre-service teacher preparation programme in preparing student teachers to teach? The problem to be investigated in this study is related to the understanding of the teaching performance of the pre-service and in-service primary physical education student teachers. Therefore, this study was designed to examine the teaching behaviours of both pre-service and in-service primary physical education student teachers during their teaching practice.

The primary purpose was to provide descriptions of the teaching performance of pre-service and in-service primary physical education student teachers in ball games lessons. The focus was on their instructional and managerial behaviours and how they presented to students. The secondary purpose was to determine whether there were differences or similarities between the teaching behaviours of the two groups of student teachers. The study also aimed at offering explanations for any differences or similarities in teaching behaviours. The latter two areas are presented as an in-depth case study of subjects selected from the two groups of student teachers in the second phase of the study that examines the factors that contributed to differences or similarities in

teaching behaviours between the pre-service and in-service physical education student teachers.

The use of both quantitative and qualitative methodologies attempted to provide a better picture of the teaching behaviours of the student teachers in ball games lessons. The quantitative data helped the investigator to understand the instructional and managerial behaviours of the student teachers in teaching ball games by means of a systematic observation instrument, while the qualitative data supplemented the information about the teaching behaviours previously identified and offered possible explanations for the differences and similarities.

1.5 Significance of the Study

The training of physical education teachers is a critical component for the improvement of teaching effectiveness of physical education teachers. Understanding more about the teaching behaviours of student teachers will help us to improve their teaching effectiveness. Currently there have been limited studies investigating teaching behaviours of pre-service and in-service primary physical education student teachers in Hong Kong, so it is worthwhile to start looking into this issue. This study represents a beginning effort to develop an understanding of what primary physical education student teachers are doing in ball games lessons. In addition, when we analyse how primary physical education student teachers teach ball game activities during their teaching practice, we may be able to understand the difficulties they encounter during these lessons. This information will indeed be invaluable to teacher educators because they may help student teachers overcome problems during their teaching practice and eventually accelerate the process of getting novices to become effective teachers.

The present study also examines and compares the teaching behaviours of pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice. The study seeks insight into individual subject's teaching context in order to assist in the formulating of reasons for any differences and similarities between the two groups as a function of differences in student teaching experiences. These hold implications for teacher education. The study tests the assumption that physical education teacher education programmes that provide student teachers with longer experience in student teaching will assist them develop better teaching skills. This study is meaningful because it will give us a detailed picture about the teaching behaviours of primary physical education student teachers during their teaching practice. The information generated will add to the physical education student teacher effectiveness research in ball games activities. This has shed light on the process of student teacher development and on the quality of the teaching practice of physical education.

1.6 Aims of the Study

In an attempt to understand the teaching behaviours of student teachers in teaching ball games activities, two major research questions guided the investigator towards looking into the issue of classroom experience and teaching effectiveness. First, are there any differences between the teaching behaviours of pre-service and in-service physical education student teachers? Second, what factors lead to the differences or similarities of their teaching performance? The investigation of the present study will mainly focus on the following objectives:

- (a) to describe the teaching behaviour patterns of pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice;
- (b) to determine whether there are differences or similarities in their teaching behaviours;
- (c) to find out whether there are any differences between the teachers' beliefs and knowledge about teaching ball games activities;
- (d) to seek explanations for any differences or similarities in their teaching behaviours and to reveal the extent of the influence of the teachers' beliefs and knowledge about teaching ball games activities which might contribute to the differences and similarities in their teaching performance.

In summary, as there is much expectation from the public that school teachers must give quality instructional performances in class, teacher educators face extra pressure to assure the quality of the graduates. The investigator in the present study is no exception. Working as a physical education teacher educator, I feel that I am accountable for equipping his students with effective teaching skills in physical education. Related to personal career experiences, I am interested in studying the teaching behaviours of my students in teaching ball games during teaching practice. Research evidence has demonstrated that classroom field experience helps the development of competent physical education teachers. Although the findings of studies on the relation between teaching experience and teaching effectiveness are inconclusive, based on

personal teaching experience and observation, student teachers with more student teaching experience seem to give a better teaching performance. Since researchers have provided evidence that there is a difference in cognitive and teaching behaviours between experienced and novice teachers, I suspect that the differences in teachers' beliefs and knowledge about teaching ball games activities may also play a part that leads to the difference of teaching performance between in-service and pre-service student teachers. In order to have a better understanding of these influential factors, the following literature review chapter will mainly concentrate on topics that relate to the teaching performance of student teachers. Teacher development, teachers' beliefs and practice, teacher socialization, participants of the teacher education programme, effective teaching behaviours, novice-expert/experienced teachers differences and teacher knowledge are the major focuses that are going to be reviewed. I expect the literature review will provide a theoretical background and concepts for the research design and research questions under investigation.

Chapter 2

REVIEW OF LITERATURE

The major focus of the present study is examining the teaching behaviours of the primary physical education student teachers. All the possible variables that might influence their teaching will be considered and reviewed. Teachers grow and develop their teaching during their professional life. At different stages they will have distinct teaching characteristics. Therefore, the author started to look into the literature of teacher development theories and explore how different teacher developmental stages influence student teachers. Furthermore, as it is generally agreed that one's beliefs and knowledge influence one's practice, teacher beliefs and teacher knowledge will also be included in this reviews section. The targeted participants of the study are the student teachers and they are receiving teacher training in a teacher education institute. The participants of the teacher education programme will inevitably exert influence on their learning to teach process. Therefore, a section on reviewing the participants of the teacher education programme is needed.

The author attempts to study the teaching behaviours of the student teachers. Effective teaching behaviours need to be clarified and understood before the study begins. Moreover, the investigator also assumes the in-service student teachers in the present study may possess different teaching behaviours as they have more in-field teaching experience when compared to the pre-service student teachers. Studies of the novice-expert/experienced teachers differences will be reviewed in order to give us more information about the differences between the inexperienced and experienced teachers. As teacher knowledge might influence how teachers teach, the investigator will also review studies of teacher knowledge

in order to examine how it influences the practice of teachers.

Therefore, this chapter contains a review of related literature with reference to the following topics: (a) teacher development, (b) teachers' beliefs and practices, (c) teacher socialization and teaching, (d) participants of the teacher education programme, (e) effective teaching, (f) novice-expert/experienced teacher differences, and (g) teacher knowledge and teaching. This review provides a theoretical basis for this study, background information for the research design and instrumentation, and key concepts pertinent to the research questions and issues under investigation. Furthermore, the findings from relevant research serve to provide insights into the interpretation of the findings and enhance the discussion of this study by giving a background for the conclusions and recommendations.

In order to have a thorough review of the literature related to the present study, computerized searches were made of electronic and internet resources supported by the Hong Kong Institute of Education Library. Major data bases reviewed were ProQuest, Academic Search Elite, EBSCOhost, E*Subscribe, ERIC, SportDiscus and many others. Examples of descriptors used for the searches were "teacher development", "teachers' beliefs" and "teaching", "teacher socialization", "expertise and effective teaching", "experience and effective teaching", "teacher knowledge", "pedagogical content knowledge" and other terms related to the study. Additionally, these terms were also used to search unpublished studies in Dissertation Abstract International. Other studies were located by a manual search of other international and local educational journals and physical education journals in the Hong Kong Institute of Education Library. Examples are Education Journal, Educational Research Journal, Journal of

Physical Education and Recreation (Hong Kong), European Physical Education Reviews and others. These searches combined produced numbers of relevant articles. Only those studies related to the present study are presented in this chapter.

2.1 Teacher Development

Development generally is regarded as the experience of change over time. This change is usually gradual and from simple to complex. Teacher development refers to the changes in a) job skills, knowledge, teaching behaviours; b) attitudes, expectations, and concerns when teaching; and c) job events involving professional responsibilities that teachers experience throughout their careers (Burden 1990).

In reality, school teachers do change and develop continuously throughout their teaching lives. Barth (1996) gave an example describing the change of attitude in learning in the life of teachers:

... the voracious learners are the beginning, first year teachers who care desperately to learn their new craft. The learning curve remains high for three or four years at which time the life of the teacher becomes highly routinized and repetitive. The learning curve flattens.... After perhaps ten years, many observers report that teachers, now beleaguered and depleted, become resistant to learning. The learning curve turns downward. With twenty-five years of life in school, many educators are described as 'burned out'.
(Barth, 1996, pp. 28-29)

It seems that care and commitment in teaching of school teachers sooner or later fade out after years of teaching. Based on their own experiences, school

teachers change personally and professionally throughout their teaching careers.

Teacher educators have been interested in, and aware of, the theories of teacher development because this information helps them to know the needs and abilities of teachers at different points in their careers and can serve as a guide for offering support to promote development growth. As pointed out by Burden (1990), understanding more about teacher development theories will hold promise for improving teacher education, staff development and institutional planning.

2.1.1 Teacher Development Theories

Teacher Concerns

Gaining knowledge about the concerns of student teachers and skill development about the practice of teaching have been the major research issues of teacher educators. Frances Fuller and her colleagues started to examine the nature of teacher concerns when learning to teach (Fuller, 1969, 1970, 1971; Fuller & Bown, 1975; Fuller, Parsons, & Watkins, 1973; Fuller, Pilgram, & Freeland, 1976; George, 1978; Newlove & Fuller, 1971). Based on the results of her two studies and reviews of the results of related studies, Fuller (1969) originally proposed four distinguishable stages of concerns or worries in the process of becoming a teacher. Initially was the pre-teaching phase of no concerns, second was the early teaching phase of concerns about himself/herself and the demands made on themselves by the situation, third was the concerns to learn about the task of teaching, and lastly was the late phase of concerns about pupils.

Fuller and Bown (1975) later refined and identified these stages as a developmental sequence teachers must pass through in progression from

self-concerns to task concerns to impact concerns. In the first pre-service preparation stage, student teachers are characterized as not concerned about teaching, but being concerned about their progress as students. In the second stage within the early field experiences, there are early concerns about survival as teachers and concerns about coping with the teaching environment, such as class control, being liked by pupils and mastery of the content to be taught. For the third stage with more teaching experience, teachers focus on their actual teaching performance (task concerns). These task concerns are about mastering the routines and daily tasks of teaching including working with too many pupils, lack of instructional materials and time pressures etc. In the final stage, after successful teaching experience the mature teachers concern is about the learning and progress of their pupils (impact concerns). These impact concerns relate to the learning, social, emotional needs and individual characteristics of the pupils.

In short, these four stages are developmental and the experience of becoming a teacher involves coping with all these stages. Later concerns would not appear until earlier concerns were resolved. The early self-oriented concerns are typified as less mature and less desirable than later pupil-oriented concerns. Once teachers' survival needs are met, they can concentrate on acquiring the skill of teaching and then on the concerns of students. Fuller and Bown (1975) used this concern model to describe the growth in teaching as "constant, unremitting self-confrontation" (p. 48).

Further studies investigating the Fuller theory were carried out by several researchers (Adams, Hutchison & Martray, 1980; Adams & Martray, 1981; Sitter & Lanier, 1982). Criticisms were received of the limited duration using cross-sectional samples of the Fuller model by these studies. Adams (1982)

showed that the results of a 5-year longitudinal study generally support Fuller's early stage of concern about self and instructional tasks. He identified differences in classroom teachers' task and self-concerns, but found no differences in their impact concerns in cross-sectional samples of first, third, and fifth year teachers. He reported that teachers' self-survival concerns decreased and their teaching task concerns increased, but their impact concerns remained stable and highest at each of the teaching experience points. Similar results were obtained by Pigge and Marso when studying cross-sectional samples of teachers at different points in their pre-service preparation and in-service training as well as a longitudinal sample of prospective teachers progressing through their pre-service training (Pigge & Marso, 1987, 1990; Marso & Pigge, 1989).

Nevertheless, the work of several researchers supports the Fuller and Bown (1975) developmental stages theory (Butler & Smith, 1989; O'Sullivan & Zielinski, 1988; Richards & Gipe, 1987). The study of Sitter and Lanier (1982) on student teachers maintained the idea of development through different stages. The students in the study showed commonalities of concern at different times in the process of learning to teach. However, most of the concerns occurred simultaneously and were managed by the student teachers concurrently. Other studies findings also supported that student teachers did not experience the concerns in a progressive sequence. Instead of resolving one separate set concerns before experiencing another, they dealt with both persisting concerns and newly emerging concerns simultaneously (Pigge & Marso, 1990; Tabachnick & Zeichner, 1984).

Similarly, a year long study by Guillaume and Rudney (1993) on the development of 19 elementary teachers' concerns noted six broad areas of

concerns reported by the student teachers: lesson planning and evaluation; discipline; working with pupils; working with cooperating teachers and adjusting to their classrooms; working with others in the profession; and transitions from student to professional teacher. Guillaume and Rudney found that these concerns were held simultaneously by student teachers throughout their school experience, but the nature of these concerns shifted as students moved towards independence and took more responsibilities as teachers. They also suggested that student teachers development was a general process in which students moved towards more complex thought patterns as their learning, experience and responsibility as teachers increased. This is consistent with Fuller's model from the survival stage to the later stage of concern about student learning.

Another study of teacher development is that of Burden (1990), who presents a comprehensive summary of research on stages of teacher development at both the pre- and in-service phases from 1970 to early 1980s. He recognized that different researchers used different terms to describe the stages of teacher development throughout their careers. Over all, the researchers classified the developmental stages as varying from two to six stages within the pre-service phase and three to four stages within the in-service phase of all the studies reviewed by Burden. Although these researchers presented views of teacher development based primarily on their own observation and anecdotal reflections, they did provide the initial framework for further investigation.

Calderhead (1987a) also identified three stages in the process of learning to teach when he studied 10 primary school student teachers through a field experience observation: 'fitting in', 'passing the test', and 'exploring'. In the first stage, Calderhead proposes that students view that task as one of fitting in to

the class teacher's routines in school with a pragmatic survival approach. In the middle of the placement, students see the task as a kind of assessment and specify competent teaching behaviours in order to please the supervising tutor. In later stages, students begin to test their teaching strategies and subject matter with reflection. However, Calderhead comments that this reflection is shallow and does not seem effective in promoting professional learning.

Leask (1999) also suggested that students progress through different stages in their development as teachers. She identified three broad overlapping stages through which students are expected to go in order to become effective teachers: self-image and class management; whole class learning; and individual pupil's learning. In the first stage, student teachers will be six and eight weeks into their school experience before they feel confident about their image and class management. In the second stage, student teachers can then start to focus on whether the learning was effectively taking place. In the final stage, the student teachers should be able to focus on the individual needs of students once they feel competent in classroom teaching and achieving global objectives.

Furlong and Maynard (1995) showed that progress of the developmental stages of student teachers is far from linear in their study. They imply that the development from student teacher to professional educator depends on the interaction between individual students, their teachers education programme, and the school context in which they undertake their practical experience. The authors consider the process of student teachers learning to teach as complex, erratic and unique to them as an individual. They identified five broad stages in student teachers' development while on their school experience: early idealism, personal survival, dealing with difficulties, hitting a plateau and moving on. At

the start of teacher education, student teachers are idealistic in how they feel towards the pupils and the image they hold of themselves as teachers. This idealism will fade when school experience begins and will focus on personally surviving. The student teachers will detect and fit in with the teachers' routines and expectations. Gradually, the student teachers will transit from this survival stage to the stage of identifying difficulties which need to be addressed in teaching. The 'hitting the plateau stage' lasts until towards the end of the first teaching experience when they feel more confident and competent in teaching. At this stage, the student teachers are more relaxed and their detailed planning and new experimenting strategies are replaced by a more limited preparatory approach and the reliance strategies they felt worked for them. With the 'moving on' stage Furlong and Maynard felt that student teachers have to challenge and become much more interventionist when working with the students.

In physical education, the findings of teacher concern studies were also contradictory. Wendt, Bain and Jackson (1981) studied the concerns of physical education student teachers during their professional preparation. They compared concern differences among physical education student teachers before and after their first teaching practice. Results indicated that student teachers had successfully lowered their concerns for self and task but also lowered concerns for their impact after the practicum. Similar results were also obtained by Boggess, McBride and Griffey (1985) when studying 69 secondary physical education student teachers' levels of concerns during their student teaching semester. This is in contrast with Fuller's postulated theory of increased concerns after teaching experience.

In a study conducted by McBride, Boggess and Griffey (1986) in assessing and identifying the kinds of concerns expressed by 30 experienced high school physical education teachers, results supported Fuller's (1969) teacher concern theory. However, Wendt and Bain (1989) obtained mixed results. They found that in-service physical education teachers got lower scores in self-concern and impact concern when compared to pre-service physical education teachers. By examining a longitudinal data set, Wendt and Bain (1989) found that only self-concerns changed over time. They concluded that physical educators did not follow Fuller's (1969) teacher concern theory and that the Teacher Concerns Questionnaire (TCQ) could only measure self-concerns, but not the other two teacher concerns.

Behets (1990) also noted that change in teacher concerns in pre-service teachers were not in accordance with Fuller's (1969) theory. He studied 100 pre-service physical educators in Belgium and found these student teachers had impact concerns scores higher than their two other teacher concerns scores during their teaching practice. Behets (1990) further looked into the issue by comparing the Teacher Concerns Questionnaire (TCQ) results with a content analysis of logbook entries of ten student teachers. The two sources of information depicted two very different pictures. Hence, Behets (1990) questioned the validity of TCQ for evaluating teacher concerns of pre-service teachers. Indeed, other researchers also queried the use of TCQ in teacher concerns studies. Fung (1993) found that TCQ scores could not differentiate pre-service from in-service Hong Kong physical education teachers. Recently, Cruz and Chow (1999) tested the Fuller's (1969) teacher concerns theory again with a sample of 75 Hong Kong student teachers of primary physical education. Teacher concerns of pre-service

and in-service student teachers were compared. Results showed no significant differences in all concern scale scores between groups, the three-factor structure of TCQ could not be replicated and Fuller's concern theory could not be substantiated. The authors questioned the suitability of the TCQ for evaluating the concerns of Hong Kong primary physical education student teachers.

Capel (1996, 1997) used the Teacher Concerns Questionnaire (TCQ) to measure British student teachers' anxieties about teaching practice. She also concluded that the TCQ might not be the appropriate instrument for investigating concerns of physical education student teachers. Hardy (1994) administered the TCQ to two cohorts of 119 one-year postgraduate student teachers in Britain on two occasions in successive years and confirmed Fuller's progressive stages of concerns. He suggested that the theory that concerns about the self make way for task concerns and finally impact concerns is reasonable, but it is possible that a shift in concerns moves in both directions and is specific to the students being measured. The students' relationship with significant others and their socialization into school all have influence on their perception of the concerns and responses at a particular time. Lastly, Hardy also questioned the validity of the instrument in evaluating the complex students concerns.

By using confirmatory factor analysis, Meek (1996) demonstrated that TCQ was a poorly fitting instrument for teacher concerns. McBride (1993) believed that the working environment of physical education teachers was different from other subject or curriculum areas; he adapted the TCQ and developed a special TCQ-PE for the physical education setting based on the responses of 500 in-service physical educators. He claimed that the TCQ-PE is suitable for the teacher concerns study involving in-service physical educators. Later, Conkle

(1996) demonstrated that the TCQ-PE is a reliable and valid instrument for assessing in-service physical educator concerns about teaching by studying a sample of 265 in-service physical educators.

Nevertheless, physical education researchers continued using Fuller's concern models as reference when studying the concerns of physical educators. Capel (1998) used a longitudinal study to identify the intensity and causes of concern of 85 secondary PE student teachers over four years. She showed that the students were most concerned about themselves, but were also concerned about the learning of pupils and their progress after all four school experiences. The intensity and causes of concerns of these students did not change over all four school experiences. The results also did not match the Fuller model.

Recently, Hynes-Dusel (1999) also demonstrated that the results of her study on 25 physical education student teachers did not support Fuller's concern theory by analyzing both quantitative and qualitative data collected. Physical education student teacher concerns changed from the beginning to the end of the student teaching experience but reflected diverse patterns. They suggested that teaching concerns were heavily influenced by 1) their cooperating teacher; 2) the assigned students they teach; 3) personal factors; and 4) the type of teacher education programmes they received.

From the studies aforementioned, the results of investigating Fuller's concern theory is rather inconclusive. At first glance there is a tendency to view teacher development in learning to teach as a linear process, with an individual entering at the pre-service level and progressing through the various stages. However, this may not be an accurate picture of the process. Rather, a dynamic ebb and flow process is postulated. Teachers may move in and out of stages in response to

environmental influences from both the personal and organizational dimensions. Their progress is very much dependent on existing factors encountered during their school experiences; their paths taken can be irregular and personal. It is likely that discrete stages of teacher development in learning to teach can be identified but they should only be regarded as broad guidelines.

From a developmental perspective, the early teachers' developmental stage seems to be more immature and undesirable than the later stages. Once teachers' survival needs are met, they can focus on gaining teaching skills and on the students' needs. Kagan (1992) suggested that the acquiring of teaching skills is a developmental process, "beginning with classroom management and organization, moving to subject matter pedagogy, and finally to what students are learning from academic tasks" (p. 144). In other words, the process of teacher development can be described in terms of a progression: beginning with self image in the survival stage and classroom management and organization, further moving to teaching strategies, and eventually turning to the learning of students. In this process, knowledge of self, classrooms, and students do not appear to grow separately and they are closely interconnected. The rationale is that the inadequate knowledge of classroom procedures will prevent beginning teachers from focusing on the learning needs of students. To be more functional, classroom procedures must become standardized and reflect the integration of instruction and management. Until such standard procedures are routinized and automated, teachers may start to focus on their own rather their students' behaviours. Only after resolving their images of self as teachers can they begin to turn focus outwards and concentrate on students' needs when learning.

Skill Development

Besides Fuller's theory of teacher development, Berliner (1988a) used schema theory and the cognitive process of novice and expert teacher performance to describe the progressive growth of teachers. Berliner (1988a) proposed a five-stage theory of skill learning and teacher development based on the stages suggested by Dreyfus and Dreyfus (1986): novice, advanced beginner, competent, proficient, and expert. This classification has been used by Benner (1984) to study clinical nursing practice. This model is a situational one where the skills or attributes required to progress from one stage to another can only be acquired by working in a real situation instead of learning theories or principles during programmes of study. The developmental sequence involved in the attainment of pedagogical expertise identified distinctive features that typified specific levels of expertise.

The initial stage is novice. Most first year teachers and student teachers come into this category. At this stage, teachers are new to the job and operate using required context-free rules and procedures in teaching. They are learning to label and use the basic elements of classroom tasks. Their teaching is rational and relatively inflexible, and requires purposeful concentration. After gaining experience in the tasks of teaching, beginning teachers move from novice to advanced beginner. Many second- and third- year teachers reach this stage. They recognize similarities across situations, storing up episodic memories and have knowledge which they relate to their current experience. Teachers build up strategic knowledge and understand when to ignore or break rules in relation to contextual situations. Their previous classroom experiences and problem contexts begin to guide their teaching behaviours. Once the teachers feel more

comfortable with instructional decision-making and are able to make conscious choices about their actions, set priorities and make plans, they have reached the developmental stage of competence. They learn good timing and targeting skills, but continue to concentrate on orchestrating their instructional behaviours.

However, their teaching is not yet fast, fluid and flexible, but teachers are able to make conscious decisions about actions, set priorities, and make plans. It takes about five years for some competent teachers to progress into the proficient stage, whereby they develop both instinctive sense and holistic perceptions of teaching situations. Through accumulated experience the teacher notices classroom information without conscious effort and predicts events more precisely. They recognize whole patterns and are able to focus on salient events when necessary, while remaining analytic in their work. Finally, after years of teaching, a few teachers move on to become experts but not all teachers can reach this stage.

Teaching decisions and actions at this stage are fluid and almost effortless. They teach intuitively and respond naturally without deliberating. Classroom management and instruction are workable and in place. They outperform all other teachers just as expert sports performers do. The stage in Berliner's model depicts differences in the way a teacher monitors classroom activities, progressing towards a more unconscious behaviour of flexible and automatic operation in teaching. This generally outlines the path along which teaching expertise is developed.

The field of physical education is equally interested in the phenomenon of skill development in physical education teaching and teacher development of expertise in physical education (Bell, 1997; Dodds, 1994; Manross & Templeton, 1997; O'Sullivan & Doutsis, 1994; Pieron & Carreiro da Costa, 1996; Siedentop,

1991; Siedentop & Eldar, 1989; Tan, 1997).

Siedentop (1991) suggested five stages of skill development in physical education teaching specifically related to student physical education teachers: 1) the initial discomfort stage, 2) learning a variety of techniques, 3) learning how to do more than one thing at a time, 4) learning how to use your skills more appropriately, and 5) confidence and anticipation, while Bell (1997), Dodds (1994) and Pieron and Carreiro da Costa (1996) employed the Berliner model in skill development of teachers to describe the acquiring and development of expertise in physical education. Passing through several developmental stages, an individual progresses and reaches the stage of expert with increasing knowledge and experience. They also outlined the characteristics of each stage specific to physical education teachers as in the Berliner model described. It seems that the field of physical education has also accepted that a physical education teacher will go through predictable stages of development in the process of learning to teach.

Similar to Fuller's theory, Berliner pointed out that classroom management and organization is at a lower level of teacher development. The higher level of development turns to the outward context in which a teacher is not limited to self-image as teacher. The teaching expertise model emphasizes perception and understanding and intuition within a given situation (Dreyfus & Dreyfus, 1986) and appears to have a logical progression based upon learning from experience. However, experience alone may not lead to learning; experience, 'has to be arrested examined, analysed, considered and negotiated in order to shift it to knowledge' (Aitchison & Graham, 1989). Benner (1984) agreed that learning resulted from experience 'when preconceived notions and expectations are challenged, refined, or disconfirmed by the actual situation'; learning from direct

experience of practice alone showed only limited growth. Therefore, learning from practice itself will result only in experience without opportunities to reflect in different ways 'on' and 'about' action and may not cause expertise development. As Dewey (1938) pointed out, only experience with meanings and full of inferences enhances learning. He further stated that experience and education cannot be directly equated to each other. Some experiences are miseducative and these miseducative experiences have the effect of arresting or distorting the growth of further experience.

As the Berliner model emphasizes learning from direct experience, it relies on skill development in situational learning instead of contextual understanding. It seems to ignore learning from other experiences, such as the observed experience of others as well as 'vicarious experience'. Lastly, the model assumes the end point of development is becoming an expert where he or she is always mistakenly treated as infallible.

Research on teacher development is varied. Nevertheless, studies are not totally incompatible. In general, teacher development involves a continual restructuring of teachers' perspectives and behaviours as they meet various situations. It is agreed that teachers will first focus on themselves and instructional tasks and then progress outward to student learning. All approaches acknowledge the reality of individual differences between the novice and the experienced teachers. They indicate that teachers change over time. With an understanding of the changes in teaching behaviours, needs and interests as teachers develop in their careers, teacher educators may provide suitable help appropriate for the level of development. Moreover, it is emphasized that factors such as historical and organizational contexts, cultures in which teachers' work is

located and their phases of cognitive and emotional development should be taken into account when considering the needs of the teachers within a particular linear career stage of the teacher development model.

By understanding more about the knowledge of teacher development in the process of teaching and learning, teacher educators can devise strategies to help their students through the transitional phase of their development as teachers.

2.1.2 Summary

It is generally accepted that good teaching is a matter of mastering the skills and knowledge of teaching. Teacher development has been regarded as an important research issue in teacher education as it is concerned with knowledge and skill development of teachers. Fuller (1969) proposed a four-stage development model suggesting that there was a progression from 'survival concerns' to 'task concerns' to 'impact concerns'. Both educational and physical education researchers demonstrated that results of some studies did not support the Fuller Developmental Theory of Teacher Concerns and different concerns were held simultaneously by teachers (Adams, 1982; Burden, 1990; Guillaume & Rudney, 1993; Sitter and Lanier, 1982; Hynes-Dusel, 1999). It seems that the concern theory of teacher development is a dynamic ebb and flow process instead of a linear developing trend. Berliner (1988a) also proposed a five-stage theory of skill learning and teacher development to illustrate the progressive growth of teachers: novice, advanced beginner, competent, proficient, and expert. Physical educators widely accepted that teachers go through different stages (Bell, 1997; Dodd, 1994; Pieron & Carreiro da Costa, 1996; Seidentop, 1991) but were careful to consider also the individual personal and environmental factors when

describing the professional growth of a physical education teacher. Overall, teacher development with respect to learning to teach is a gradual process that progresses generally from an internal self-oriented nature toward a more external student-oriented nature. This information is valuable to teacher educators when they help their in-service and pre-service student teachers to improve their teaching performance. Similarly, this picture of teacher developmental growth is also an important reference for the investigator when he studies the teaching behaviours of in-service and pre-service student teachers in the present study, as the in-service and pre-service groups may be at different stages of their teacher development.

2.2 Teacher's Beliefs and Practice in Teaching

Teachers grow and develop as a process of learning. In learning, teachers develop their beliefs and ideas, developing their classroom teaching skills and attending to their feelings associated with changes. This developmental growth includes the concept that teachers develop their beliefs and ideas about what it means to be a teacher, the instructional process and their professional development. Research has indicated that what teachers believe about teaching and learning influences how they think about their teaching, how they behave and learn through experience in their educational settings (Grossman, Wilson & Shulman, 1989).

Educators have long assumed that beliefs are the best indicators of the decisions individuals make throughout their lives (Bandura, 1986) and that beliefs teachers hold affect their teaching behaviours in the classroom (Brookhart & Freeman, 1992; Clark, 1988; Nespor, 1987; Weinstein, 1989). In practice, beliefs affect decisions related to evaluation and judgments of content,

instructional strategies and task selection.

Some believe that beliefs teachers hold about teaching and learning reflect their theoretical orientation and influence the practices they choose to use in the classroom (Hollingsworth, 1989; Holt-Reynolds, 1992; Rust, 1994).

Understanding more about the beliefs of teachers will help to understand more about their teaching performance. Therefore, Pajares (1992) argues, “Understanding the belief structures of teachers and teacher candidates is essential to improving their professional preparation and teaching practices” (p. 307).

2.2.1 What are Beliefs?

Beliefs are difficult to define since they are studied in diverse fields and result in a variety of meanings (Eisenhart, Shrum, Harding & Cuthbert, 1988). Brown and Cooney (1982) explained beliefs as dispositions to action and major determinants of behaviours, although the dispositions are time and context specific. Beliefs have been defined as “mental construction of experience—often condensed and integrated into schemata or concepts” (p. 351). Harvey (1986) defined belief as an individual’s representation of reality that has enough validity, truth, or credibility to guide thought and behaviours. A belief is “any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase I believe” (Rokeach, 1968, p. 113). Pajares (1992) overviewed these definitions and came to the conclusion that beliefs are “an individual’s judgment of the truth or falsity of a proposition, a judgment that can only be inferred from a collective understanding of what human beings say, intend, and do” (p. 316).

In education, definitions of beliefs include a cognitive component, an affective component and a behavioural component (Rokeach, 1968). The cognitive component represents knowledge, the affective component relates to emotion and the behavioural component is activated when action is required (Eisenhart et al., 1988). Besides, other elements related to the definition of belief in the field of education include: those based on evaluation and judgment; those linked to action and behaviour; and those whose context is specifically defined.

2.2.2 Teachers and Their Beliefs

A teacher's actions are guided by a personally held system of beliefs (Clark & Peterson, 1986). An individual's belief system includes beliefs, attitudes, and values (Rokeach, 1968). Tabachnick and Zeichner (1984) distinguished these terms by defining attitudes as beliefs organized around an object or situation, while values include comparative and judgmental functions. Therefore, when a situation requires decision-making, a belief system is used to make a judgment. Individual beliefs and an attitude, formed through a network of beliefs, interact and function as a value that influences the nature of the decision.

Teachers hold beliefs beyond the matter of their profession and these global beliefs also influence teachers' practice. A teacher's attitude towards a particular educational issue may include beliefs connected to more global issues. These connections create values that guide one's life, develop and maintain other attitudes, interpret information and determine behaviour (Eisenhart et al., 1988).

To understand more about teacher behaviour, researchers advocated a focus on teachers' educational beliefs (Clark, 1988; Nespor, 1987). Educational beliefs

include beliefs about students and the learning process, about teachers and teaching, about the nature of knowledge, about roles of schools in society and about the curriculum. Usually all teachers hold beliefs about their work, the subject they teach, and roles and responsibilities. These beliefs strongly connect to classroom action. Ernest (1989) indicated that two mathematics teachers in his study might have similar knowledge but teach in different ways. He explained that differences in beliefs about teaching and learning could greatly influence how teachers choose and present their teaching content to students.

Since beliefs are deeply personal and formed by observations, chance and intense experiences, they can be created through enculturation, incidental learning, or direct and purposeful learning (Pajares, 1992). Educational beliefs are therefore evolved from personal experience, values, biases, prejudices, and orientations to teaching (Clark & Peterson, 1986). Teachers' educational beliefs have been developed from their own professional career experience and being students over the years.

Beliefs appear to be acquired through a process of cultural transmission and enculturation during students' formative years (Pajares, 1992). Memorable experiences or critical incidents have an extreme effect on the beliefs that beginning teachers bring to their practice (Knowles, 1994; Nespor, 1987). Perry and Rog (1992) identified that pre-service teachers considered their past teachers and personal experiences as students as the factor that had the greatest influence on their beliefs about teaching and learning. However, educators found that traditional beliefs acquired during early years were reinforced by the teacher education programme (Kagan, 1992). As teacher educators attempt to change long-held beliefs that pre-service teachers bring to their programme, these

prospective teachers seek to find evidence to support their existing beliefs (Bird, Anderson, Sullivan & Swidler, 1993).

Daily teaching experiences also influence some of the teachers' beliefs (Ennis, 1994a). Experiences reinforce some beliefs (Clark & Peterson, 1986; Rokeach, 1968) and environmental limitations force the abandonment of others (Ennis, 1994a). Barnes (1992) argues that new beliefs may emerge and long-held beliefs may be strengthened or set aside after perceptions of the opportunities and constraints defined by the culture of the school.

Indeed, the utilization of beliefs in judgmental decisions is linked with past experiences. The earlier a belief is incorporated into the belief structure, the more central and strongly located it is to the belief system, the more difficult it is to change. Therefore, those peripheral beliefs are less influential and are more likely to be abandoned. Tobin and LaMaster (1995) gave an example of a teacher in their study that wanted to implement her constructivist beliefs, but this turned out to be unsuccessful because her beliefs about control were stronger than her beliefs about learning.

Educators have shown that long-held beliefs are resistant to change (Bramald, Hardman & Leat, 1995; Powell, 1992) but some teacher education programmes have been successful in promoting change in beginning teachers' beliefs (Rust, 1994). 14 novice teachers were reported by Hollingsworth (1989) to have changed their beliefs when they were placed with cooperating teachers holding different beliefs from them. However, change did not occur unless the cooperating teacher encouraged them to try out their own belief-based practices.

Changing beliefs have been noted as a gradual process (Peterman, 1991) that is facilitated through experiences that create cognitive dissonance (Hollingsworth,

1989). The integration of newly acquired beliefs into a belief system does not mean they will become an important influence in that system. Instead, recently acquired beliefs are more likely to be abandoned (Pajares, 1992). Thus, when new teachers encounter the persuasive views of veteran teachers and traditional school policies, they find it difficult to maintain the constructivist beliefs they recently acquired during their teacher education programmes (Ennis, 1994a).

Rust (1994) found the prospective teachers in his study entered the teacher education programme with a variety of beliefs about teaching and learning. At the end of the programme, however, their beliefs had not changed much. Through the programme they acquired new beliefs that student construct knowledge and teachers take the role of facilitating the process by interacting with them and promoting their independence in learning. Yet they failed to apply the practice of these beliefs during subsequent observations of their beginning years of teaching. Rust suggests that the beliefs acquired by some teachers in the teacher education programme were temporary, long held beliefs acquired prior to their professional preparation had greater influence and were used to make decisions during their classroom practice.

A teacher's decision in teaching is influenced by his or her knowledge or beliefs (Lubinski, 1994). Peterman (1993) stated that the primary way that teachers give meaning to educational beliefs is through their instructional behaviour in the classroom. Brickhouse (1990) pointed out the connection of beliefs to action is highly complex.

A teacher might hold a particular belief but it might have no influence on his or actions because external constraints, such as contextual factors may suppress any changes considered (Tobin, Tippin & Gallard, 1994). According to Clark

and Peterson (1986), beliefs represent a rich store of knowledge that influences teachers' planning and their interactive thoughts and decisions. The interpreting and understanding of teachers' daily teaching tasks depends on this knowledge of, and belief about, objects, people, events and their relationships. Conversely, teachers' behaviours and actions also affect the development of beliefs. The evidence gained from classroom practice serves to strengthen, modify or change the original beliefs. Classroom events and school settings offer either constraints or opportunities for the development of beliefs (Clark & Peterson, 1986).

Teachers' beliefs about teaching and learning may influence their ability to improve student learning and their interest in subject areas. According to Eisenhart and his colleague (1988), teachers believe they are responsible for creating an educational environment conducive to student learning.

Teachers' attributions for the causes of student performance have been regarded as the most important beliefs that teachers hold about learning (Clark & Peterson, 1986). What teachers expect from their student affects their students' achievement in the classroom. Teachers' expectations of students depend on their belief about students' ability. Teachers teach according to these beliefs and students respond in line with the teacher's actions and eventually the teacher's belief about the students is then reinforced. Reinforced beliefs held over a long time period will act as a form of knowledge. Beliefs and knowledge become progressively more entangled when used in making decisions related to teaching (Kincheloe & Steinberg, 1993). Lewis (1990) argues that the origin of all knowledge is found in beliefs. He further stated that the socially constructed nature of knowledge developed from reflection could be regarded as beliefs held by an influential group of individuals.

2.2.3 Developing Teachers Beliefs

Since teachers' beliefs appear to relate to their teaching behaviours, educators become interested in studying teachers' beliefs within the educational settings. Pre-service teachers are thought to formulate a belief system about teaching while they are students in school. Lortie (1975) used the term apprenticeship of observation to describe these hours spent in classrooms in both elementary and secondary schools. This apprenticeship influences conceptualizations about effective teaching, appropriate teaching behaviours and student behaviours in classroom.

Kagan (1992) reviewed 27 studies examining changes in personal beliefs or images of pre-service teachers during their professional growth. He documented the central role played by preexisting beliefs/images and prior experience in filtering the content of education course work. He also confirmed the results of previous studies that pre-service students enter programmes of teacher education with personal beliefs about the teaching image of good teachers, images of self as teachers, and memories of themselves as pupils in the classroom after reviewing studies examining how knowledge of teaching changed during a practicum, during student teaching or in the course of an entire pre-service programme. He further explained that these personal beliefs and images generally remain unchanged by a pre-service programme and follow candidates into classroom practicum and student teaching. For professional growth to occur, prior beliefs and images must be modified and reconstructed. In constructing images of teachers, novices may extrapolate from their own experiences as learners. As novices progressed through the programme, linkages among prior beliefs, programme knowledge and classroom experiences appeared to grow stronger.

Veenman (1984) in a review of studies pointed out that pre-service teachers became increasingly idealistic in their attitudes toward teaching during their pre-service training then shifted to opposing views as they moved into the first years of teaching. Hoy and Woolfolk (1990) reported similar results when they used self-report questionnaires to measure beginning teachers' attitudes. They found their attitudes had shifted to more pessimistic and custodial.

2.2.4 Beliefs and Practice

Understanding a teacher's practice is not easy, as its nature is complex. Coles (1990) describes practice as "an expression of a personal and professional way of knowing that is shaped and informed by personal and professional background, experiences, perceptions, attitudes, beliefs, and goals" (p. 203). It is likely that teachers' beliefs direct their practices in the classroom. In fact, beliefs play a significant role in the learning to teach process. The beliefs of student teachers acquired during their young schooling experience have already affected their learning to teach. Educators identified that the prior beliefs that prospective teachers bring to their education programme serve as schemata through which they interpret the course content and their experience in the field (Hollingsworth, 1989; Holt-Reynolds, 1992). They use their beliefs to justify the implementation of teaching techniques that are generally considered as less effective by teacher educators (Holt-Reynolds, 1992). Some beginning teachers reject the strategies learned from the teacher educators that are inconsistent with their beliefs (Ennis, 1994a) and modify those that are more compatible with their prior beliefs (McDiarmid, 1990).

In physical education, Hutchinson (1990) studied the impact of secondary students' school histories on their willingness to acquire knowledge in professional preparation programmes. She found that students' family, involvement in school, and involvement in organized athletics influenced their perception of physical education. They were strongly attracted to sport and saw physical education as a means to a coaching career. This perception constrains the physical education teacher educators to put more focus on educational physical education. Indeed, these beliefs and perceptions are what Dewar and Lawson (1984) called subjective warrants, which help define for the student teachers about the skills and abilities required for entry and performance of work in the teaching profession. The subject warrant is formed through direct observation of members of the occupation and through information provided by others in one's social environment. Individuals use the subjective warrant to evaluate their own abilities to successfully carry out teaching tasks as well as making decisions to pursue careers in teaching.

Similar results were reported by Doolittle, Dodds and Placek (1993) when examining the beliefs of three recruits about the purposes of physical education and good teaching from entry to exit in one teacher education programme. The results showed that recruits with different prior experiences have different initial beliefs about teaching that persist through professional training that in many ways treats them the same. Such persistence of beliefs highlights the power of recruit-stage experience in restricting what recruits learn. They will learn different things from the programme because of the belief systems formed in earlier years. Their beliefs about what physical education should do for students, formed through their own experience in physical education and sports classes as

students, persist as reference points against different views they learn during teacher education.

Moreover, the beliefs of the beginning teachers also influence their interpretations of the content of the teacher education programme and how the information is stored and manipulated in their practice (Nespor, 1987; Pajares, 1992). Teachers' beliefs guide the choosing of instructional strategies, methodologies and teaching content used to assess student learning (Ennis, 1994a; Knowles, 1994) and affect the implementation of the curriculum they design (Bird et al., 1993; Powell, 1996).

Beliefs influence how beginning teachers interpret their classroom experience and understand their own teaching (Johnson, 1994; Knowles & Holt-Reynolds, 1991). Teachers' perception of their practice and beliefs acts as a guide for successful practice (Johnson, 1994).

A substantial number of studies support the notion that teachers' beliefs affect both beginning teachers' teaching behaviours and serving teachers' (Johnson, 1992; Mangano & Allen, 1986; Rupley & Logan, 1984; Wing, 1989).

Rupley and Logan (1984) reported that elementary teachers' beliefs about reading influence their instructional decision-making. Richardson and his colleagues also found the beliefs of teachers in Grades 4, 5 and 6 relate to their classroom practice. Mangano and Allen (1986) showed that teachers approach language arts instruction differently depending on their beliefs about writing. They found both the instructional practices and the interactions between teachers and students differ according to the teachers' theoretical beliefs about writing instruction. Johnson (1992) also indicated that the majority of English as Second Language (ESL) teachers possess clear theoretical beliefs that consistently reflect

one particular teaching approach. The results showed that ESL teachers who possess clearly defined theoretical beliefs provide literacy instruction that is consistent with their theoretical orientation and that teachers with different theoretical orientations provide different literacy instruction for non-native speakers of English.

Wing (1989) also demonstrated similar results in the early childhood context. She found that preschool teachers' theoretical beliefs influence their instructional practices as well as shaping preschool children's perceptions of the nature and uses of reading and writing.

These studies' results indicate that teachers teach according to their theoretical beliefs. Teacher's thinking about their roles and the beliefs and values they hold would shape their pedagogy.

In order to find the real picture of the relationship between teacher practices and their belief systems, several researchers have employed multiples measures including classroom observation, stimulated recalls, think-aloud protocols and focused interviews to examine teachers' beliefs and practices in actual classroom contexts (Davis, Konopak & Readence, 1993; Konopak, Wilson & Readence, 1994; Wilson, Konopak & Readence, 1991). Results of these studies generally supported the inconsistent relationship between teacher practices and their belief systems.

Educators explained that contextual factors could have great influence on teachers' beliefs and affect their teaching practice. The complexities of classroom life might constrain teachers' abilities to apply their beliefs and provide instruction that is in line with their theoretical beliefs (Duffy, 1982; Duffy & Anderson, 1984). Duffy and Anderson (1984) found that although reading

teachers were able to articulate their beliefs about reading outside the classroom, their actual instructional practices were governed by the nature of instructional and classroom realities. Davis, Konopak and Readence (1993) also noted that individual teacher's agenda, school climate, resources and beliefs shaped their understanding of the daily instructional tasks. They suggested the differences in the degree of consistency between beliefs and practice might be due to the varying psychological, social and environmental realities of the participants' respective schools that either give a chance or restrict teachers from implementing their beliefs in their instructional decision-making. Hoffman and Kugle (1982) further explained that teachers' theoretical beliefs are situational and are transferred into instructional practices only in relation to the complexities of the classroom.

In all, as student teachers progress along different career stages, some beliefs may be modified. Student teachers will filter new information within these stages through a screen of experiences and beliefs acquired during the apprenticeship period. When conflict emerges between old beliefs and new knowledge, a dialectical process occurs (Schempp & Graber, 1992). The dialectical process is a two-way interaction process. This process will be further explained in the teacher socialization section in the later part of this chapter. Within this process, some beliefs are more easily modified than others. This helps to explain why some researchers find that student teachers enter teacher education with a custodial orientation gradually shifted toward a more humanistic orientation, and eventually revert back to a custodial orientation upon reentry into public schools (Dodds, 1989; Locke, 1984; Templin, 1979). In other words, the relationship between beliefs and practice is complex and two-way, instead of a unidirectional approach.

2.2.5 Beliefs about Teaching Physical Education

Physical educators also agreed that physical education teachers' beliefs were closely related and had great influence on their physical education teaching. Siedentop (1991) stressed the importance of student physical education teachers having clearly defined beliefs about teaching physical education. He identified three types of beliefs that were particularly relevant to teaching physical education: the understanding of physical education, subject content of physical education and the teaching and learning of physical education. He suggested that physical education teachers should have clear concepts of these three areas before they teach, as these beliefs would guide them throughout their careers as physical education teachers.

Another physical educator, Ennis, has conducted several studies that focus on the influence of teachers' educational beliefs or values, described as curricular values orientation, on their goals and objectives for physical education (Ennis, 1992a, 1994a, 1994b, 1996; Ennis & Chen, 1993). Curricular value orientations have been used in the literature as beliefs about the educational process (Eisner, 1992). According to Ennis (1994a), values orientations depict the relative priority that a teacher places on several key factors in teaching. These include teaching the disciplinary body of knowledge, accommodating student interests and needs in curriculum selection and responding to or shaping the teaching environment in which the teacher works. Physical education teachers find they must set priorities when confronted with numerous limiting environmental factors in the physical education lessons. Teachers' experiences in working in these situations help them create a blend of knowledge and beliefs. Physical education teachers develop unique educational belief systems or value profiles that influence

their selection of content, teaching strategies and tasks in their gymnasium (Ennis & Zhu, 1991).

In physical education, there were numbers of value orientation research designs implementing the study of individual teachers to compare their values profiles with their teaching behaviours (Solmon & Ashy, 1995), their expectations, planning behaviours, goal orientations and the content of teaching (Chen & Ennis, 1996; Ennis, 1992b, 1994a; Ennis, Mueller & Hooper, 1990; Ennis, Ross & Chen, 1992). These research findings suggest that physical education teachers have a diversity of value orientations. These priorities are due to the constraints and opportunities within different school settings (Chen & Ennis, 1996).

In all, research findings of teachers' beliefs in physical education were in line with those found in general education studies. Beliefs of physical education teachers exert a certain influence on their classroom behaviours. Ennis, Ross and Chen (1992) have demonstrated that a physical education teacher's determination to overcome obstacles is related to the strength of his or her belief in the importance of the task to the teaching of students. Teachers will make a great effort to find ways to teach content that they believe is important to their students' learning. Conversely, teachers will spend minimal efforts to improve situations that restrict the teaching of content when they think the content is unimportant. Similarly, teachers will not implement a new curriculum that they had no part in designing or that is inconsistent with their beliefs.

One physical education researcher tried to discover how beliefs about the purposes of elementary school physical lessons were reflected in their teaching practices. Roberts (1992) invited five experienced elementary physical education specialists to participate in the study. Results indicated that teachers'

beliefs about the participants reflected some common thinking yet remained highly individualized. No teacher was able to carry out practices that were consistent with all her purposes. It seems that, besides beliefs, other factors have also played a part in influencing their teaching behaviours.

Recently, Behets (2001) showed that the values profiles of both pre-service teachers and in-service physical education teachers reflected the recently introduced curricular innovations and physical education concepts. He suggested that the process of enculturation and social construction (Pajares, 1992) created educational beliefs that are similar to the value orientations observed in other studies.

From the findings of these studies, it appears that physical education teachers are no exception to the fact that teachers' beliefs influence teaching behaviours. However, the values and beliefs of physical education teachers are not the only variables affecting their teaching; other personal and environmental factors have also exerted influences.

2.2.6 Summary

The instructional practices that teachers use in their classrooms appear to be influenced directly by the beliefs and values held by them. Therefore, an examination of teachers' beliefs and values helps us to understand more about the nature of their practice. As beliefs are evolved from personal experience, they will be modified and reconstructed with the professional growth of teachers. Although the findings of the relationship between teacher's beliefs and practice are inconclusive, it is generally accepted that teachers' beliefs play an important part in the process of learning to teach. Physical educators also agreed that

beliefs are closely related to their practices in gymnasium. The research findings concerning beliefs and values in the field of physical education are similar to those findings in general education or other field areas. Physical education teachers' beliefs appear to affect their teaching behaviours in the gymnasium to a certain extent, and some other factors have also been involved in this teaching process. For the present study, it is possible that both in-service and pre-service student teachers will possess different beliefs and they may exert certain influences on their teaching in the gymnasium during their teaching practices. Do the in-service and pre-service student teachers in the present study possess different beliefs about teaching physical education? To what extent do their beliefs affect their teaching behaviours? These questions needed to be addressed when examining their teaching behaviours in ball games lessons.

Since teaching beliefs and teaching behaviours were mainly influenced and developed by socialization effects, the following section will explore how teachers were socialized and the effects of the socialization process to their teaching.

2.3 Teacher Socialization and Teaching

Teacher socialization research provides the understanding of the process by which one becomes a member of the teacher society (Danziger, 1971). This information is fundamental and helps to enhance teacher development at both the in-service and pre-service levels. In this section, introductory definition of socialization will be given followed by the discussion of different stages of socialization process in teaching physical education. Furthermore, the internal processes through which the physical education student teachers present perspectives are challenged through encounters with significant socializing agents

during different stages socializing processes will also be discussed.

It is likely from the findings of the studies documented above, that teacher education programmes have little impact on the beliefs and practices of student teachers entering the profession (Doolittle, Dodds & Placek, 1993; Perry & Rog, 1992; Rust, 1994). Bain (1990) points out that some factors seem to affect the transfer of skills from training to practice, including degree of initial mastery, context of the workplace, and student teachers acceptance or rejection of skills. Teacher socialization research has attempted to discover the process how a teacher become a functioning education workforce and try to offer explanations why teacher education programmes have failed to influence the predisposition of teachers.

2.3.1 What is Socialization?

There are different definitions of socialization with respect to their different relative emphasis. Merton, Reader and Kendall (1957) provided a general definition which encompassed both emphasis on the process as well as the agent of socialization. Merton et al. (1957) defined socialization as “the process by which people selectively acquire the values and attitudes, the interests, skills and knowledge—in short the culture—current in the groups to which they are, or seek to become, a member” (p. 287). They indicate that individuals are actively in choosing and selecting the basic values and practices within the profession.

For many years, educators see teachers as passive individuals who willingly received, adapted and conformed to the forces of socialization (Goodman, 1988; Zeichner, 1986b). Pre-service teachers were overwhelmed and shaped by the social structure of professional culture. They were adjusting to external forces,

being either sculpted by the past and the present. This functionalist orientation viewed pre-service teachers as “apprentices” who were to be moulded to replicate the practice of an experienced teacher. However, this orientation was inadequate and failed to explain why some teachers resisted institutional and societal norms supported during teacher education (Templin & Schempp, 1989) and the existence of individual teacher misfit the major pattern of teacher development (Tabachnick & Zeichner, 1984).

Subsequently, researchers provided evidences that participants were active agent in their own socialization and this process as interactive (Lacey, 1995; Schempp, 1989; Zeichner, 1986b). It can be argued that teacher socialization is a dynamic process in which teachers play an active role in the development of their beliefs, behaviours, and teaching perspective (Graber, 1991; Zeichner & Gore, 1990). When ones push back against the forces of socialization in such a way, the process may be called dialectical.

Within this dialectical process, the participants and the institution interact to establish a pattern of teacher socialization that is unique to that individual (Schempp & Graber, 1992; Tabachnick & Zeichner, 1984). Instead of being moulded by the society, the individuals are seen as active agents in the production of their behaviours.

Due to the interactive nature, the role of experiences and perspectives developed from biographical factors in the occupational socialization process may exert more influence than institutional norms and expectations. Student teachers will actively respond, adapt and adjust to the domination of social situations. With regard to this concept of social adjustment, Lacey (1977) proposed a model of the socialization process that includes self-governing action, where social

change was the outcome of the selections adopted by the individuals.

Lacey (1977) identified three strategies that individual uses to adjust to the situations: a) internalized adjustment, where the individual totally complies with the institutional values and norms; b) strategic compliance, in which the individual complies with the situational constraints but holds private reservation beliefs; and c) strategic redefinition refers to the successful attempts in changing the situations to the individual's preference.

The work of Marrs and Templin (1983) supported Lacey's strategies proposal and even found strategies used by physical education student teachers went beyond those of Lacey (1977). The student teachers actively participated in various strategies: a) selective modeling, the choosing of specific traits or behaviours to follow; b) studentship, the behaviours that a student uses in order to get through the experience with the greater ease; and c) self-legitimation, the evaluation of self and others performance in order to validate their own behaviour. These evidences suggest that student teachers may progress with a variety of strategies during their field experience.

2.3.2 Socialization into Teaching Physical Education

Since the 1980s, researchers have been interested in understanding how individuals learn to be physical education teachers studied their occupational socialization. Occupational socialization was defined as "all kinds of socialization that initially influence persons to enter the field of physical education and that later are responsible for their perceptions and actions as teacher educators and teachers" (Lawson, 1986, p. 107). By borrowing from the literature on socialization into medicine and law, physical educators identified

three phases of socialization into teaching into physical education: recruitment socialization (anticipatory), professional socialization (pre-service), and organizational socialization (entry into work) (Lawson, 1983a, 1983b; Templin & Schempp, 1989). This model progresses on the bases of interaction and learning which include interplay among participants, their experiences, socializing agents, and settings. More specifically, the research questions addresses in this investigation are linked to these three phases of teacher socialization.

Recruitment Socialization

This is the stage that individuals develop perceptions about a profession before entering teacher education programmes. Templin, Woodford and Mulling (1982) regard recruitment as anticipatory socialization. They suggested that both psychological and socio-cultural factors might exert influence an individual's decision to enter a given field. Recruitment was described as the process whereby an individual becomes attracted to and makes the choice of a particular occupation (Dewar & Lawson, 1984).

Teachers enter teacher education with diverse conceptions about teaching profession. These preconceptions about teaching are formed from a variety of sources and role models such as parents, siblings, or close friends. Their own experiences as students in schools and watching teachers at their work has the greatest influence on what prospective teachers learn and internalize as the professional responsibilities of teacher. Burlingame (1972) described this period of time as where individuals try to anticipate the occupation role of teaching by imaging, playing, acting or other vicarious experiences. Therefore, educators argue that the education of teachers begins long before teaching roles are assumed

or a programme of professional education is entered (Lawson, 1983a, 1983b; Lortie, 1975).

According to Lortie (1975), teachers begin internalizing the work and role of teachers the moment they begin their careers as students in schools. By “apprenticeship-of-observation”, teachers understand well about the attitudes, skills and responsibilities of those who teach. Likewise, physical educators also theorized that the years spent as a student in physical education and sport programmes provided similar social influence for potential physical education teachers (Lawson, 1983a). These learning experiences as students shape the future attitudes, decisions, practices, and professional orientation of a physical education teachers and also act as an evaluation screen for the subsequent experiences pass through during the socializing process (Schempp, 1989).

Moreover, researchers showed that there were several common reasons attracted one entering career of physical education teaching: 1) offering opportunities to work with and help others, 2) to serve society, and 3) to continue linkage with sports and physical activities which are viewed as rewarding and enjoyable (Belka, Lawson & Lipnickey, 1991; Dodds, Placek, Doolittle, Pinkham, Ratliffe & Portman, 1992; Hutchinson, 1993; Lawson, 1986; Templin, Woodford & Mulling, 1982). Data also suggested that physical education teaching required less academic requirements to the recruits than the other subjects (Dewar, 1989). Lawson (1986) further explained the prospective teachers choosing physical education over other subject areas were due to the influence of their own sport socialization processes. There is a twofold socialization processes involved: 1) socialization into sport, and 2) socialization via sport. The former process will be affected by individuals’ experiences in physical education settings as well as

the influence outside school environment such as family and media. The latter process is referred to as “which participants may acquire consumer preferences and lifestyle patterns” (Lawson, 1986, p. 107). This may nurture the choosing of a sport-related career of an individual.

Lawson (1983b) also argued, “the socialization of physical education teachers begins in early childhood, results in a subjective warrant for teaching physical education and continues upon entry into teacher education programmes” (p. 3). The subjective warrant is “an individual’s perceptions of skills and abilities necessary for entry into and performance of work in a specific occupation” (Dewar & Lawson, 1984, p. 15). This is formed through direct observation of participants of the occupations and through experience in one’s social environment. Dewar (1984, 1989) specially examined students’ subjective warrants prior to their entry into physical education programmes. She found that the view of majority of high school students attracted to or decided upon careers in physical education, regard physical education as skill oriented and involved learning how to play games and how to teach them to others.

Similarly, Hutchinson (1990) found that 10 high school students who intended to choose physical education teachers as careers had well-developed and firm beliefs about teaching physical education through the use of interviews and role-playing activities. The students believed that fun and interest should be the major emphasis in the physical education lessons. Instruction would be in low priority because all students were assumed to perform skills if they tried hard enough.

Better understanding the subjective warrants that people have for the profession of physical education helps us know more about the recruitment into

the profession. If we have a better understanding of who our recruits are and what beliefs are about teaching physical education, we may be able to better design, sequence, and present professional content to ensure a more beneficial teacher education programme. An increased understanding of the prospective teachers also enhances teacher educators to socialize them for their role as physical education teachers.

Recently, Hutchinson and Buschner (1996) have raised the issue of changing demographics of student currently entering higher education. Educators found adult learners entered their academic teacher preparation programmes with rich life experiences and clear self-motivated and directed career goals (Hutchinson & Buschner, 1996; Manos & Kasambira, 1998). It is likely the process of socialization for the delayed-entry prospective teachers is different from the traditional students. As the in-service student teachers in the present study are more mature as the delayed-entry prospective teachers, they may receive different socialization influence as compare to the pre-service student teachers. They might have different beliefs about teaching physical education and teachers as well.

Although the contexts of the studies differed, findings were relatively consistent. Prospective teacher had established stable and inflexible beliefs, preconceptions about teaching and images as teacher, from their own classroom experiences as pupils. This implies the important role anticipatory socialization plays in shaping the personal beliefs and images of student teachers (Kagan, 1992). This prolonged anticipatory socialization process has important implications for teacher education programmes. Schempp (1989) pointed out the perspectives toward teaching formed during this apprenticeship might influence

teacher to formulate their future professional experiences and reject any dysfunctional educational practices. Teacher educators could ground professional preparation development in respect to students' past knowledge and experiences to pay extra awareness of their biographies and to minimize conflicts between the students and the teacher education programmes (Graber, 1989). It is apparent that, besides recruitment socialization, the professional training can exert potential impact on student teachers into teaching physical education.

Professional Socialization

The second stage is defined as professional preparation. Through this process, teachers would acquire and maintain the knowledge, values, sensitivities, and skills that are deemed ideal for the profession (Lawson, 1983a). Zeichner and Gore (1990) have identified that there are three components within the teacher education programmes exert certain influence on the socialization of teachers: a) general education and academic specialization courses, b) methods and foundations courses, and c) field-based experiences. The former two components are seen as where prospective teachers learn the theoretical principles, and knowledge and skills for teaching. While through the field-based experiences, student teachers have chance to practice their newly acquire teaching behaviours and approaches in more genuine environment.

Professional Courses

It is assumed through the professional courses, prospective teachers learnt the basic knowledge, values and principles of professional practice. However, some educators suggest that these courses had little influence on the subsequent

behaviours of teachers (Crow, 1986; Katz & Raths, 1982).

Lortie (1975) confirmed that teacher education seemed to have low impact on teacher attitudes and behaviours. He found that teachers claimed their own teacher exerted continuing influence on their present instructional practices instead of the formal teacher training programmes.

Hoy and Woolfolk (1990) even found there were no changes in attitudes of student teachers after they had completed the professional methods course. They attempted to study the impact of the educational methods course on the perceptions and beliefs of 191 student teachers. The teaching efficacy, pupil-control ideology, and problem-solving orientation of the student teachers were assessed at the beginning and end of the course by using questionnaires. Results from the study revealed the educational method exerted minimum influence on the student teachers.

Professional socialization is seen as an interactive process whereby the teachers' present experiences are constantly challenged by past experiences and interpretations (Schempp & Graber, 1992; Zeichner & Gore, 1990). By studying on "studentship" in her studies, Graber (1989, 1991) offers insights and explanations why there is no transfer of learning from the pre-service training courses to real school teaching situations of beginning physical education teachers. According to Graber (1989), studentship is a set of behaviours reacting to the socialization forces, which enhances students to progress through their training programmes with greater ease and success. In practice, students in the teacher education programmes try to assimilate knowledge and values set by teacher educators. They would determine what to acquire or ignore, and resolve to progress through the programme at their own pace. Graber found students in her

studies fronting an appearance of acceptance but restraining their disagreement and rejecting the official teaching orientations.

In another study, Doolittle, Dodds, and Placek (1993) also provided evidence that student teachers adjusted their learning in the pre-service training with their pre-conceived beliefs. They studied the beliefs of three physical education recruits from entry to exit in one teacher education programme. At the end of the programme, they either rejected or accepted particular practices offered by the teacher education programme according to their pre-existed core beliefs.

Other researchers investigating the biographies of recruits also suggested that dispositions, past experiences, and reasons for entering the careers into teaching might affect what recruits learn during the pre-service preparation and later believe when they become certified teachers (Dewar, 1989; Lawson, 1989; Schempp, 1989). Therefore, it is possible for the recruits to resist the learning from the teacher educators and lowering the effects of teacher education programmes.

Field Experience

Field experience represents a transition from the formal preparation program to the actual school teaching of beginning teachers. It is normally integrated with the structure pedagogical courses or stand independently as the requirement of the teacher preparation programmes. Student teaching and class-related field experiences are now usually included in most teacher education programmes (Placek & Silverman, 1983).

During the student teaching experience, the student teachers would first assume the role and responsibilities of a teacher in real school settings. Yet, due

to their personal experience act as students observing this role, the student teachers would be unpleasant facing these unexpected challenges. These practices rarely conform to the student teachers' anticipations or definition of teaching (Kagan, 1992; Schempp & Graber, 1992).

One typical feature showed by the studies on the impact of student teaching experience is the change in student teachers attitudes towards pupils, discipline, and teaching as they moved through their practicum (Graham, 1991).

Williamson and Campbell (1978) and Moser (1982) reported the student teachers in their studies increasingly became more custodial as justify harsher methods of discipline as just and effective. Templin (1979) also demonstrated that the student teachers in their experience promptly reject behaviours learned in their physical education teacher education programme. The student teachers' attitude changed from humanistic to more custodial during their student teaching experience.

In additional to the facing of unexpected social role and responsibilities of teaching, the student teachers also meet different socializing agents during field-based experiences. Different participants within the field experience setting play a certain part in influencing the socialization process of the student teachers. These participants are: a) student teachers, b) university supervisors, c) cooperating teachers, and d) pupils. A separate section on the influences of these participants on student teachers will be discussed in latter part of this chapter.

In short, student teachers bring own expectations about teacher education when entering the programme. Teacher education programmes do not exert much influence on student teachers as expected. Thus, if a teacher preparation programme is to be effective and successful, teacher educators must try to

accommodate students' predispositions, expectations, and studentship behaviours in a way to infuse them with the orientations, the sensitivities, the knowledge, and the skills basic for teaching in schools.

Organizational Socialization

This is the final stage in the teacher socialization process. Within this stage, new teachers acquired the knowledge, values, sensitivities, and skills endorsed by the workplace when they transit from the teacher education programmes to actual school teaching (Lawson, 1986). On the basis of learning and interaction, organizational socialization occurs. In practice, different workplace factors could either support or limit new teachers intent on teaching in congruence with the perspectives and practices advocated during their teacher preparation programmes once they entered the school.

When enter into the workplace, new teachers usually conform, internalize the school norms and tradition, as well as imitating the experienced teachers around them. However, this transition from professional preparation to the workplace is not easy. The new teachers mostly experience "reality shock" (Lawson, 1989) when they recognize their teacher preparation is not matched with the workplace requirements. They usually abandon the perspectives of teacher education and adopt the school traditions or norms. They start to follow the experienced teachers around and result in either an immediate or delay 'wash-out' of the effects of professional preparation (Lawson, 1983a, 1983b). This organizational culture plays an important role in the occupational socialization of new teachers.

In practice, the new teachers begin to learn strategies by trial and error for survival in school. According to Huberman (1989), the induction period in new

school is the time for discovery and survival. The first year of teaching is critical as it may determine whether a new teacher will stay in the profession and what type of teacher he or she will become. Huberman further added that the relationship with the students and colleagues, instructional ability, and enthusiasm closely related to the difficulties of this induction period.

Nevertheless, beginning teachers are facing problems and limitations during the induction period, especially the first year of teaching (Solmon, Worthy & Carter, 1993; Veenman, 1984). Veenman (1984) identified eight usual problems for beginning teachers: classroom discipline, motivating students, dealing with individual differences, assessing students' work, relationships with parents, organization of classwork, insufficient or inadequate teaching materials and supplies, and dealing with problems of individual students. Veenman (1984) concluded that the more problems that a beginning teacher faces, the more likely the teacher will leave the profession.

Similarly, Solmon, Worthy and Carter (1993) also recognized common problems and difficulties of 1st year physical education teachers used to face. "Classroom management, lack of control, discipline problems, frustration, anxiety, isolation, a sense of being overwhelmed by job responsibilities, and feeling unprepared to do the job" are all the frequent difficulties mentioned by the beginning teachers (Solmon, Worthy & Carter, 1993, p. 313). However, physical educators argue that these problems and difficulties do not create much trouble to beginning physical education teachers. The transition shock experienced by classroom teachers may not be the characteristics of physical education teacher induction (Kreider, 1985; O'Sullivan, 1989; Schempp & Graber, 1992). It seems "that the dialectic stirred by the tensions of 1st year teaching seems, at this point,

relatively mild for physical education inductees” (Schempp & Graber, 1992, p. 343). They speculate that this might be due to the marginal nature of the subject and such status may lead to lower pedagogical expectation and teaching performance for physical education teachers.

Anyhow, in their inquiries into beginning physical education teachers’ experiences, Stroot, Faucette, and Schwager (1993) found that the new teachers experienced role conflict, isolation, reality shock, and burnout in their first year teaching. These experiences all are congruent to the difficulties what Veenman (1984) found ten years ago.

Workplace conditions also affect the socialization of teachers. Educators showed that workplace conditions greatly influence teachers’ commitment to teaching, teaching effectiveness and their retention in the profession (Goodlad, 1984; Lortie, 1975). This is especially true to teaching physical education. Locke, Griffin, and Templin (1986) reveal that the lack of adequate facilities and equipment, the large class sizes, and the lack of time for instruction are common problems in physical education teaching.

Lawson (1989) further indicates that workplace conditions include variables such as personal-social factors (the interpersonal relationships among the school participants, etc.), situational factors (students’ subcultures, teaching loads, etc.), organizational factors (bureaucratic norms, resource allocation system, etc.), and political-economic factors (teacher unions and government influence, etc.). These factors interact with each other and influence the practices of new teachers.

In short, organizational socialization is diverse and lead to “wash-out” effects of the teacher education. Organizational culture, workplace conditions and all participants in schools play an important part in the organizational socialization of

beginning teachers. However, the new teachers are not passive recipients, instead, they actively interact and learn within the socialization process.

2.3.3 Summary

It is apparent that research on teacher socialization in two decades shift from a functionalist to a dialectical or interpretive perspective. The studies from a dialectical approach show that the teachers can play active role in the establishment of their beliefs, attitudes, and behaviours in relation to the workplace requirements and constraints. This information is valuable for understanding the ways in which physical education teachers are socialized into the teaching of physical education.

Research on socialization into physical education indicates a three-stage process. Moreover, these three phases are closely inter-related. Results data indicate that the first year teaching is important because it determines what types of teacher he or she will be as well as whether staying in the profession. This prompts educators aware how to help the new teachers successfully transit from novice to effective veteran teachers. Research also shows that organizational socialization may result 'wash-out' effects of professional education. It is essential to understand the main features of the school culture as well as the workplace conditions and how they influence the teaching performance of beginning teachers. In practice, teachers learn and internalize school norms and culture. However, new teachers actively modify the organizational culture through their interaction with the institutional norms and workplace conditions. Base on the interaction and learning, teacher socialization is a continual interplay process between individuals and the institutions (Zeichner, 1979).

From the review of the research on teacher socialization, it is obvious that the in-service and the pre-service student teachers in the present study are both continuously influenced by different socializing agents within their learning and teaching environments. Thus, their teaching behaviours in ball game lessons are the outcome influential products of several socializing effects. However, do these socializing agents exert the same influence on the two groups of student teachers? Or do they influence them differently? Which agent plays a more powerful role in the socializing process? As the student teachers in the present study were pursuing their teacher certificates within two teacher education programmes, it is essential to review the influence of the participants of the teacher education programme on their professional development process. Besides, according to the literature in teacher development, teaching behaviours may start to stabilize at the four to six year period of a teacher's service (Katz, 1972). It is likely that the more experienced teachers will have less socializing effects from the participants. Do the in-service student teachers experience less socializing influence effect than the pre-service student teachers in the present study? Do these socializing influences contribute to the differences or similarities of the teaching behaviours between the two groups of student teachers? These all are interesting questions that the investigator would like to look into in the present study. Nevertheless, teacher educators are interested in the effects of teacher education programme. There is no exception to the investigator in the present study. In the following section, I shall discuss the roles of different participants of the teacher education programme and how they affect student teachers in the learning to teaching process.

2.4 Participants of the Teacher Education Programme

The quality of the student teachers learning to teach depends much on the participants of the physical education teacher education programme. These participants play important roles and exert influence on student teachers especially during field experiences. This section introduces the roles of different participants of the physical education teacher education programme and follows this by discussing how the participants affect student teachers and their teaching at the end.

Bain (1990) states that many of the studies of participants in pre-service teacher education focus on two major groups: undergraduates and teacher educators. In practice, there are more than two groups of participants involved. They are the student teacher, the university supervisor, the cooperating teacher and the pupils. Each party brings something to affect the training of the student teachers. The student teachers bring their experience as students in physical education lessons, the university supervisors bring their knowledge gained from teaching and research, the cooperating teachers bring their knowledge of teaching gained from the school teaching experience and the pupils bring their attitude towards physical education and behaviours within the physical education lessons.

2.4.1 Student Teacher

Lortie (1975) stated that a student's biography has the most influence in preparing a teacher. Their own past experiences have provided a knowledge framework for the work and role of a teacher. He used the term "apprenticeship-of-observation" to describe the knowledge gained and the beliefs established when the student teacher was a student. He estimated that students

spend approximately 13,000 hours observing what teachers practice and learning about the routines and rituals involved in the teaching profession. Numerous educators have investigated the impact of students' own experience as pupils on their teaching and they suggest that these exert a powerful influence on their responses to the teacher training programme and their perception of their own practices (Calderhead, 1988; Calderhead & Robson, 1991; Goodman, 1986; Kagan, 1992; Nettle, 1998). Some even believe the personal beliefs and values of the student teachers about teaching are resistant to any real change or may only have become elaborated during training (McDiarmid, 1991; Tabachnick & Zeichner, 1984; Zeichner & Liston, 1987).

Nettle (1998) has shown both stability and change in the beliefs of student teachers as they progress through their studies. An association was found between changes in student teachers' beliefs and the beliefs held by supervisors.

Bramald, Hardman and Leat (1995) found that 162 PGCE students during their one-year course changed their thinking about the teaching and learning process and the initial training course. The student teachers' knowledge of teaching gained from earlier experience was highly influential in their views about teaching and learning and their interpretation of the course. They indicated that the course of training also had effects on the student teachers concerning their own individual course component. This reinforces the notion of the characteristics and components of courses in relation to their effect on students' thinking.

While studying the development of physical education teachers, Schempp (1989) pointed out the apprenticeship period acquaints prospective teachers with teaching tasks and the analytical framework for evaluating the quality of

professional practice. The teachers made use of their past experience as students in meeting their teaching duties during their student teaching experience. The pedagogical practices, attitudes and beliefs were based on their own interests and mediated by the individual's personality and occupational demands. Graber (1995) also found biographies of students in physical education teacher programmes were very influential in developing their own beliefs about teaching. Their subsequent actions as physical education teachers were not much affected by the teacher education programmes (Graham, 1991; Hutchinson, 1993). Tan (1995) conducted a study of the effects of different parts of a teacher education program on pre-service teachers. From the study of four student teachers, he concluded that teacher preparation was not particularly influential as the pre-service teachers' perspectives formed prior to the course and student teaching remained unaffected.

From the results of the above studies, it seems that the effects of personal beliefs and values on students' practice varie across different students and situations (Calderhead, 1988).

2.4.2 University Supervisor

If teacher education programmes aim at preparing competent beginning teachers, the university faculty members are assumed to be responsible for educating the student teachers in basic teaching principles and skills. Educators identified that the primary function of the university supervisor was to "help the student teacher make sense of his or her teaching experience within the framework of the total curriculum" (Corcoran & Andrew, 1988, p. 21) as well as to advise the student teacher in classroom teaching matters. Therefore, the

physical education faculty within the teacher education institution is liable for equipping students to become quality physical educators. Lawson (1991) has recognized the importance of the university faculty member within the physical education teacher programmes: “PETE professors play pivotal roles in the reproduction and transformation of work practices in physical education” (p. 229). Graber (1995) substantiated this point in her research. She found through interview with student teachers that one faculty member was the most influential within a physical education teacher education programme, having more impact than four years of classes, field experiences and student teaching.

In practice, university faculty members also played an essential role when they were assigned as supervisors during the students teaching practice. Besides supervising student teachers, they are responsible for helping students see connections between theory and practice (Goodman, 1985). They also exerted great influence on the student teachers.

In a study by Corrigan and Griswold (1963), student teachers working with certain supervisors consistently became more positive towards teaching, school and children. Students considered their university supervisors as the major influence on these changes. Friebus (1977) also found that university supervisors helped their students by providing ideas and suggestions about specific teaching problems and played a role as coaches in the study.

In reality, the university supervisors seem to fulfill their roles without much effort. They usually enter the placement school as disenfranchised outsiders of the school (Slick, 1997, 1998). They only perform the functions of advising and assessing student teachers in regard to specific lessons observed in occasional visits to the placement school (Burton, 1998). McIntyre (1984) shows that

university supervisors have exerted little or no impact on student teachers' attitudes and behaviours. Some even have failed to effectively supervise the student teachers by providing infrequent visits and did not conduct quality professional supervision in the schools (Bowyer & Dyke, 1988). It seemed that some university supervisors did not put effort in supervising their students. Perhaps it is due to the changing nature of the roles of the university supervisors as the increasing academicisation of the teacher education and physical education teacher education and the requirement of conducting research (Howey & Zimpher, 1990; Mitchell, 1993). It is generally agreed that the top priority of the roles of university faculty are teaching and conducting research. However, researchers indicated that most university would reward the professors based on their scholarship. It is understandable that university faculty would devote more time to research and less time concentrating on supervising student teachers (Mitchell, 1993). Therefore, some educators viewed the role of the university supervisor as unnecessary within the student teaching experience (Monson & Bebb, 1970). For the sake of the learning of student teachers, no wonder that Schilling (1998) proposed that university supervisors should play a more proactive role in helping the student teachers during student teaching process.

2.4.3 Cooperating Teacher

The third group of participants in the physical education teacher education programme is the cooperating teacher. The cooperating teacher is recognized as the person who can exert great influence over student teachers during the student teaching experience (Coulon & Byra, 1995; Dodds, 1985, 1989; Emans, 1983; Gallemore, 1981; Schempp, 1989; Zimpher, 1987). Karmos and Jacko (1977)

commented that “not only were cooperating teachers perceived as having the most influence on student teachers, but their influence was perceived to be more in person support and role development than in skill development” (p. 54).

Researchers have found that the attitudes and values of student teachers incline toward those of cooperating teachers by the end of the placement (McIntyre, 1984; Tabachnick, 1980). They concluded that cooperating teachers having significant impact over student teachers in shaping their attitudes and behaviours as well as changing their values. Friebus (1977) investigated 19 student teachers to determine the most influencing agents of socialization during student teaching. He showed that the cooperating teacher was mostly mentioned by student teachers as offering a coaching role. The effect that the cooperating teachers have on the student teachers will determine their level of satisfaction with the student teaching experience. Other studies also indicated that cooperating teachers have substantial influence on the success of the student teaching experience (Copeland, 1978; Seperson & Joyce, 1973). Educators accounted for the cooperating teacher’s influence was due to the enormous amount of time the cooperating teacher and student teacher spent together (Guerrieri, 1976; Yates, 1982).

As the student teaching experience takes place with the cooperating teachers’ class and students, it is natural the student teachers would adopt to a certain degree the attitudes, values and teaching practices of the cooperating teacher when they are under the guidance of them (Watts, 1987). Tinning and Siedentop (1985) further explained that the physical isolation of the gymnasium from other classrooms also prevents physical education student teachers’ interaction with other teachers. They learn teaching, organization and social tasks mainly from

their cooperating teachers. Locke (1972) commented on the significant influence of cooperating teachers: “The best program in the world can produce trainees with the desired behaviors and values—but any public school that does not share the same values can reshape the trainee in a few days” (p. 99).

Jones (1992) found that student teachers like student teaching when they receive supporting feedback and help from the cooperating teachers and other school staff and have bad feelings when failing to get services. This stresses the idea that student teaching sites should be carefully chosen in order to give a supportive and friendly environment for the prospective teachers. Student teachers can benefit most if they are placed with well-qualified and competent cooperating teachers within the field experience process.

However, the cooperating teachers may not see themselves playing an important role within the professional development of student teachers. Zimpher, deVoss & Nott (1980) reported that cooperating teachers did not perceive themselves responsible for helping the student teachers to develop pedagogical knowledge, attitude and teaching skills during the practicum. They only see student teachers as some kind of assistant that can lighten their teaching duties. Conversely, some researchers found results at the other extreme. Tannehill (1989) noticed that cooperating teachers bore a feeling of responsibility to the profession and perceived their role as a contribution to the profession by being a mentor to the student teachers. Some even viewed themselves as in a position of power within the student teaching triad (Veal & Rikard, 1998).

In reality, some cooperating teachers may be unprepared and do not possess the skill of helping the student teachers. Paese (1984a) found most cooperating teachers in his study make minimal or no difference in affecting the student

teachers. He contended that cooperating teachers often lack awareness of supervisory principles and skills to help the student teachers. In a study by DelGesso and Smith (1993), the cooperating teachers being studied admitted that they lack supervisory preparation prior to student teaching practice since they had no idea about their roles during student teaching. Tannehill and Zakrajsek (1988) studied the supervisory behaviours and practices of 18 cooperating teachers in secondary physical education and also showed that they either lack the necessary supervisory skills or possess inadequate preparation in supervising the student teachers.

The training of cooperating teachers seems to be an important issue within the teacher education programme. Researchers demonstrated that if cooperating teachers were trained properly in supervision, they could be effective supervisors (Killian & McIntyre, 1986; Ocansey, 1988; Paese, 1984a; Tannehill & Zakrajsek, 1990). Rikard and Veal (1996) studied 23 physical education cooperating teachers with no formal training and found that they gave little feedback and offered no proper way of helping the student teachers. They found the cooperating teachers had lack of supervisory confidence and expertise when supervising student teachers. It seems that training programmes for cooperating teachers are needed in order to help them supervise the student teachers effectively.

2.4.4 Pupils

Doyle (1979a) argued that pupils in school have played an important part in the teacher socialization process, as the schoolteachers are typically isolated from their colleagues in their teaching environment. The influence of pupils ranges

from general teaching methods to communication between teachers within the classroom activities. Freibus (1977) supported the findings about the influence of pupils in the teacher socialization process in his study. From the results of interviewing, student teachers most frequently cited pupils as a significance source of legitimization, which means the pupils played an active role in the student teacher's struggle to assume the professional role of teacher. Pupils were also used as a reference for the images of student teachers' success or failure.

Templin (1981) also identified that pupils played a significant role in socialization of student teachers in physical education setting. Pupils' performance and their compliance with classroom regulations influenced student teacher teaching; student teachers tended to adopt a custodial approach to discourage student deviance when teaching. Templin asserted that physical educators had to recognize the powerful influence of their students and the implications of this influence on their behaviours and attitudes.

In sum, all the four major participants, the student teacher, the university supervisor, the cooperating teacher and pupils have contributed and affected the student teachers' professional development at different stages.

Researchers suppose that success in the student teaching experience depends on the nature of the relationships between the student teacher, cooperating teacher and the university supervisor (Campbell & Williamson, 1973; McNally, Cope, Inglis & Stronach, 1994; Stark, 1994). Recently, Darden, Darden, Scott and Westfall (2001) highlighted the importance of teamwork of these three major participants. They discussed how the teamwork approach contributed to the development of effective teaching practices of student teachers. Indeed, effective teaching develops gradually and must be nurtured by all the parties

involved. The teamwork approach would be a possible means to help to create a positive and meaningful field experience for the student teachers.

2.4.5 Summary

Different groups of participants in the physical education teacher education programme have influenced student teachers learning to teach and develop into competent teachers. They are the student teacher, the university supervisor, the cooperating teacher and the pupils. Each group has distinct roles and characteristics in socializing the student teachers. The influence of biographical factors on the development of teaching perspectives and the relationship and interactions between the individual and the institution, all play a part in the teacher socialization process. Understanding such a dialectic nature provides important insights into the professional development of beginning teachers as they get over their teacher education in order to learn how to be competent teachers.

In reviewing the influence of the participants in the teacher education programme on the development of student teachers, we learn that different parties have their roles in the student teaching experience process. We need to pay special attention to the effects of these participants when studying the teaching behaviours of pre-service and in-service student teachers in the present study.

Effective teaching has been a major issue in the research into teacher education. It is assumed that all student teachers should acquire knowledge and master skills of effective teaching before they graduate. As the present study is to examine the teaching behaviours of physical education student teachers, therefore, there is a need to understand more about effective teaching in physical education. Since the teaching environments of physical education teachers are different from other subjects' class teachers, the coming section will specifically

address the issue of effective teaching in physical education.

2.5 Effective Teaching

Over the years, hundreds of studies have been conducted to identify effective and ineffective teaching behaviours of teachers. As teaching is a complex act, what works in some situations might not work in other school settings with different subjects and students. It is hard to distinguish between “good” and “poor” teachers and there are difficulties about agreeing upon generalizations about successful teaching (Coker, Medley & Soar, 1980; Shulman, 1988).

Some researchers assert that good and effective teachers can be distinguished from poor and ineffective ones according to their teaching behaviours, and that the magnitude of the effect of these differences on students can be determined (Brophy, 1986; Gage & Needels, 1989). Classroom behaviours include the interactions between teachers and students, teachers’ expectations of and attitudes towards students, classroom management techniques and teaching methods which all make a difference.

At the very earliest, it was believed that effective teaching was related to the teacher’s personality traits, mental abilities, attitudes, and similar factors which were virtually nonexistent. Research direction at that time focused on identifying these characteristics and the rating of them (Barr & Emans, 1930; Hart, 1934). Educators indicated that the results of these studies on determining characteristics teachers related to teaching had not identified any specific traits that predict teaching effectiveness (Dunkin & Biddle, 1974).

Other early teaching research can be best characterized by studies attempting to find a universal ‘best’ method of teaching (Brophy & Good, 1986). These

studies usually compare the mean gains in student achievement by teaching different methods to two or more classes. Due to the incomplete descriptions of the methods employed and the design of the instructional setting, most of these results could not be applied to other instructional settings and produced contradicting results.

The major aim of the educational researchers in conducting studies on teacher effectiveness is to know what is going on in the classroom. Systematic classroom observation appears to offer solution for the above purpose. One key turning point with descriptive teaching research was the development of the Flanders Interaction Analysis System (Flanders, 1960). This observation system has helped many researchers to study the interaction patterns of teachers and students in the classroom at that time.

During the 1960s and early 1970s, many different observation instruments have been developed and refined by educational researchers to provide descriptions of events in the classroom and specific environment to physical education (Amidon & Flanders, 1971; Cheffers, 1977; McLeish, Howe & Jackson, 1981; Medley, 1977). The research conducted during this period using these instruments aimed at finding generic teaching behaviours effective in different contexts. Unfortunately, the findings of these researches showed conflicting results.

The research on teaching physical education began at this period. Most of the early studies were descriptive, using different observation systems to look into the pictures of what physical education teachers and students were doing in the gymnasium. One of the significant projects was led by Dr. William Anderson at Teacher College at Columbia University called “What’s Going on in the Gym?”.

Other notable descriptive studies were carried out by Dr. John Cheffers and his students using Cheffers Adaptation of the Flanders Interaction Analysis System at Boston University and Dr. Daryl Siedentop and his students adopting a variety of behavioural categories systems at Ohio State University. These studies produced descriptive data and formed the foundation of what we know about teacher and student behaviours.

A number of experimental studies were also conducted by Dr. Siedentop at Ohio State University (Siedentop, 1981) during this period, in which the purpose was to see how teacher and student behaviours could be changed through an intervention during teaching field experiences. The findings of these studies were used to help student teachers change certain teaching behaviours and to improve how time spent in class.

In the 1980s, Academic Learning Time—Physical Education system (ALT-PE) (Siedentop, Tousignant & Parker, 1982) developed by Siedentop was popularly used by researchers to code and quantify teacher and pupil behaviours. Many of the descriptive and intervention research were completed using the ALT-PE as the main data collection instrument.

As early work by Bloom (1980) had suggested that teacher behaviour variables were alterable, therefore, the argument was that intervention strategies designed to improve the pattern of teacher behaviour could help teacher to improve their performance and increase the learning of their students. However, before this intervention could take place, the patterns of teacher behaviour need to be identified first. Studies of finding patterns of teacher behaviours were then carried out. By developing the Physical Education Teacher Assessment Instrument (PETAI), Phillips and Carlisle (1983) found that there were substantial

differences in patterns of teacher behaviours between the most and least effective teachers. This aroused the interest of researchers to study teacher behaviours in the research of teaching effectiveness.

Dunkin and Biddle (1974) developed a “process-product” model to examine the relationships and variables involved in the teaching/learning process, and also relating them to the student achievement outcomes in classroom research. Few physical education researchers conducted these studies because of the lack of reliable and valid outcome measures. Besides, Doyle (1979b) also finds that this unidirectional model inadequate because it does not account for a number of other variables also influence the learning environment. Nevertheless, Dr. Stephen Silverman (1996) and his students have completed a series of process-product studies in physical education and produced results similar to those from classroom research.

Since researchers agree that effective teaching is not “one size fits all”, they turn their focus on context and try to understand what is happening in teaching. Research interests become highly specialized and diverse. Many researchers concentrated in investigating teaching from the perspective of the teacher and the student as well as the student’s role in the teaching-learning process. For seeking answers of these kinds of research questions, researchers have employed naturalistic inquiry or qualitative research method extensively in the 1980s and 1990s. Recently, some researchers adopted both quantitative and qualitative methods in their investigations within one study (Ennis, 1994b; Kutame, 1997; Siedentop, Doutis, Tsanaridou, Ward & Rauschenbach, 1994). It seems that using two approaches carefully together can help us know more about the teaching and learning in physical education by utilizing the best features of each

methodology. This reinforces the investigator in the present study to adopt both quantitative and qualitative methods to study the teaching behaviours of the student teachers as to generate a better picture of what they are doing in the teaching practice.

Indeed, the findings of the research on classroom teaching and teaching physical education have contributed much to the field of teaching effectiveness. These helped the researchers and practitioners have a better understanding of how teachers teach and students learn in classroom as well as physical education lessons.

With the support of the findings in the ORACLE (Observation Research and Classroom Learning Evaluation) studies (Galton, Simon, Croll, Jasman & Willcocks, 1980; Galton & Simon, 1980; Simon & Wilcocks, 1981), researchers found that school children adjusted their behaviours to fit in with the teachers' teaching style and the teachers seldom changed their style of teaching during the studies. It is likely that teaching style was the dominant influence although mediated by pupil behaviours. If the pattern of children's behaviours and work in the classroom is set by the teacher's style, then the teachers' teaching behaviours and practice in lessons become essential factors in effective teaching. Therefore, studying teachers teaching behaviours is one of the important research topics in teaching effectiveness.

Then what are effective teaching behaviours? This section begins by introducing the definition of effective teaching and follows by the discussion of effective teaching behaviours in physical education. Following the discussion of effective teaching behaviours, the review turns to the instructional and management skills related to the teaching process. Lastly, this section will

conclude with a discussion how the time variable affects teaching physical education. This review section gives valuable information about teaching effectiveness in physical education, which also provides a discussion framework for this study.

2.5.1 What is Effective Teaching?

Students learn as a result of experience. They learn in the classroom but that may not be intended. Teachers are therefore expected to produce intended learning in school. Physical education teachers are required to possess qualities and skills to increase students' knowledge and proficiency in physical activities. Educators describe effective teaching as teaching that results in intended learning (Berliner, 1987b; Rosenshine, 1987). Schempp (1992) states that an effective teacher is one whose practices result in superior student achievement and the effective teacher is defined in what students learn. Gage (1978) points out that effective teaching provides more intended learning than does less effective teaching. As teaching is contextual and influenced by many factors simultaneously, it is difficult to just copy or apply the practices of an effective teacher. Brophy and Good (1986) gave a more detailed description of effective teaching:

“effective instruction involves selecting (from a large repertoire) and orchestrating those teaching behaviours that are appropriate to the context and to teacher's goals, rather than mastering and consistently applying a few ‘generic’ teaching skill.”

(Brophy & Good, 1986, p. 360)

Recent research studies into effective teaching tend to produce lists of qualities, dispositions, attributes and behaviours of effective teachers. An early study into effective teaching by the Organization for Economic Co-operation and Development collected data from 11 countries (OECD, 1994). The researchers in this study observed that teaching quality should be regarded as a holistic concept and made up of competencies across five key dimensions:

1. knowledge of substantive curriculum areas and content;
2. pedagogic skill, including the acquisition of ability to pursue a repertoire of teaching strategies;
3. reflection and the ability to be self-critical, the hallmark of teacher professionalism;
4. empathy and the commitment to the acknowledgement of the dignity of others;
5. managerial competence, as teachers assume a range of managerial responsibilities within and beyond the classroom.

Another recent work on effective teaching was the Hay McBer Report (DfEE, 2000). This report observed that teaching skills, professional characteristics and classroom climate were the three main groups of factors within teachers' control which significantly affect pupils' progress. This also means more lists of dispositions, qualities and behaviours, but the lists are less hierarchical and with levels of performance. It seems that much of the previous research on effective teaching concentrated on the visible aspects of teaching. The emphasis is on qualities, aptitudes, dispositions, behaviours, processes, values and attitudes.

Recently, Good and Brophy (2000) reviewed the process-product, correlational and experimental studies and highlighted the most widely replicated

findings concerning the outstanding performance characteristics of effective teachers in various teaching perspectives: 1) active teaching, 2) teaching to mastery, 3) teacher expectation/ role definition/ sense of efficacy, 4) student opportunity to learn, 5) classroom management and organization, 6) curriculum pacing, and 7) a supportive learning environment. However, they caution that effective teaching is probably related to context, experience and knowledge. Good and Brophy (2000) also criticized that conclusions about teaching behaviours were generated from studies limited to teaching primary age children in reading and mathematics. They further reported that this research failed to look at teaching for understanding and higher order application and concentrated much on the development of academic skills and knowledge.

Indeed, the results of most process-product studies of the 1960s and 1970s indicated that direct instruction was more effective in producing student learning gains in subject matter that was highly structured. Direct instruction is defined by this research as having the following characteristics: 1) a task-oriented relaxed environment, 2) clear instructional goals and materials, 3) active monitoring of student progress toward these goals, 4) structured learning activities, and 5) immediate academically oriented feedback. Recently, researchers have continued providing supporting evidence about the benefits of direct instruction (Waxman, Huang, Anderson & Weinstein 1997; Weinert & Helmke, 1995).

Although direct instruction became a synonym for good teaching in certain situations, Rink (1998) comments:

“Direct instruction may not be the best way to teach some students some things. When the subject matter requires student problem solving or higher-order thinking skills and when the subject matter is not highly

structured, ... the limited responsibility given to the learner in direct instruction may produce other results that are undesirable,..."

(Rink, 1998, p. 47)

As educators understand that direct instruction may not be a silver bullet in every situation, Schempp (1987) warns that the results of descriptive-analytic studies should be treated carefully since the learning environment is a complex setting in which numerous factors operate concurrently.

In the field of physical education, several physical educators agreed that effective teacher behaviours are specific to subject matter, students and environment after they had reviewed three groups of studies in physical education settings (Graham & Heimerer, 1981). As teaching is contextual in nature, one must consider the characteristics of the teacher, the students and the school in order to improve pedagogical practice and promote the learning of students.

2.5.2 Instructional and Management Skills in Physical Education

Research studies on effective teaching have produced a significant body of pedagogical knowledge from the late 1970s to the present. Sources such as Brophy and Evertson (1974), Brophy and Good (1986), and Glass (1977) provide detailed overviews of the main research findings of effective teaching. Most of these studies were classroom research conducted in process-product research design that identified what teachers who produce the most learning do. Their main purposes were investigating variables that characterized effective teaching. Most of these variables were also studied by physical education researchers with similar findings.

Effective teaching depends on classroom instructional and management skills.

Doyle (1986a) identified that there are two major tasks of teaching:

...teaching has two major task structures organized around the problems of a)

learning and b) order. Learning is served by the instructional function.

Order is served by the managerial function, that is by organizing classroom groups, establishing rules and procedure, reacting to misbehavior, monitoring and pacing classroom events and the like. (Doyle, 1986a, p. 395)

Physical education researchers also demonstrated that teachers' instructional technique, feedback behaviours and management skill in class were related to effective teaching and student learning in most physical education settings studies.

Teacher Instruction

Effective instructional skill is related to student learning. Several researchers have identified several categories of teacher instruction behaviours (Graham & Heimerer, 1981; Zakrajsek & Tannehill, 1989). They can be grouped as follows: cueing, grouping, praise, questioning, presenting, structuring, controlling, modeling, and warmth.

Results of process-product studies indicated the effects of teacher instruction on student achievement. Evertson, Emmer & Brophy (1980) showed that more effective teachers gave content presentation, praise and direction more frequently than less effective teachers. Physical educators also recognized that how teachers present their tasks might influence student learning. Graham and her colleagues (Graham, 1988; Graham, Hussey, Taylor & Werner, 1993) studied effective teachers' movement task presentation in physical education by employing a qualitative analysis and concluded that there are eight dimensions of

effective task presentations: 1) making instruction explicit; 2) emphasizing the usefulness of the content being presented; 3) structuring new content; 4) signaling student's attention; 5) summarizing and repeating information; 6) checking for understanding; 7) creating a productive climate for learning; and 8) presenting accountability measure.

Physical educators further reported that task presentation skills lead to teaching effectiveness in physical education (Kwak, 1993; Landin, 1994; Rink, 1994; Werner & Rink, 1989). Werner and Rink (1989) were two of the early researchers in physical education that conducted study into the role of task presentation skills in learning. They investigated four different physical education teachers teaching jumping and landing skills in their second grade classes. They found that the use of qualitative cues, appropriate number of cues and the use of visual demonstration with verbal explanation might help the effectiveness of their teaching.

Kwak (1993) conducted an experimental study on task presentation in lacrosse throwing. One hundred and twenty seven eighth grade students were randomly assigned to five experimental conditions. They were measured on their accuracy in throwing the lacrosse ball as well as their use of appropriate movement process characteristics. The researcher indicated that the experimental condition of a verbal explanation with full demonstration, summary cues, and verbal/visual rehearsal gave the best student performance on the above two measures. This implied that proper task presentation leads to effective physical education teaching.

Rink (1994) stated that clarity of task presentation was one of the most consistent variables identified as being related to teacher effectiveness. It

discriminates between the more and less effective teachers. Landin (1994) also agreed that effective task presentation in physical education was characterized by clarity, the use of full demonstration and delivery of cues that were accurate, qualitative and appropriate in number.

In short, effective teachers are good communicators. The teacher's ability to communicate with the students affects his effectiveness of teaching. Effective teachers would communicate to learners exactly what the student's responsibility is in the learning process and what processes they intend the student to engage in or they would make sure students understand exactly what they are supposed to be doing before they send them off to do it.

Teacher Feedback

Feedback is information about performance given by teachers in response to student action in class. Students receive most of the feedback during or immediately after performance. Teachers hope that by providing appropriate feedback they will modify the students' performance and monitor their learning progress. They believe the ability to give appropriate feedback and high frequencies of teacher feedback will result in greater student learning.

Randall (1992) classified feedback into various forms according to its usage. His categories of feedback are as follows: 1) according to its valence, call positive and corrective; 2) according to its latency, call immediate or delayed; 3) according to its precision, call general or specific; 4) according to its timing, call concurrent or terminal; 5) according to its target, call individual, group or whole class; and 6) according to its relevance, call congruent or incongruent to the task. Each type of feedback serves a particular function in the instructional setting.

Feedback is essential to student learning. Bilodeau and Bilodeau (1961) have demonstrated the importance of feedback to motor skill learning. Results of their study show that no improvement occurs without feedback, progressive improvement takes place with it, and deterioration arises quickly after its withdrawal. In the field of motor learning, research findings supported the importance of feedback to skill acquisition in laboratory settings (Magill & Wood, 1986; Salmoni, Schmidt & Walter, 1984). Motor learning theorists reviewed several motor learning laboratory research studies regarding feedback effects and also suggested that teachers provide students with feedback that is specific, congruent to the task, and corrective so that learners understand how to perform correctly on later trials (Magill, 1989; Schmidt, 1988).

Besides, feedback may be used as information for motivation. Bandura (1986) suggested that feedback might provide motivational benefits that could increase beginning/low-skilled students' self-efficacy and persistence to learn. One physical educator agrees that the function of specific feedback in a teaching setting is more than merely information about performance, it is also used to motivate and keep practice focused in large instruction classes (Van der Mars, 1989a). It is apparent that teacher feedback fulfills the three basic functions of information, motivation and reinforcement.

Physical education researchers have indicated that teacher feedback is an important variable in effective teaching in their studies (Masser, 1987; Pellet & Harrison, 1995; Phillips & Carlisle, 1983; Silverman, Tyson & Morford, 1988; Xiang & Lee, 1995).

Pieron (1981) found more effective beginning physical education teachers to be more specific in their feedback when teaching the handstand rollout to college

students. Phillips and Carlisle (1983) found that the most effective teachers spent more time in performance feedback, and less time in behavioural feedback, than least effective teachers. Masser (1987) indicated that students who received specific feedback achieved significantly higher scores in the standing long jump than students who received general feedback. Silverman, Tyson & Morford (1988) found that practice time with feedback was strongly correlated with student achievement.

Xiang and Lee (1995) also noted that students who are more task oriented benefit more from knowledge of performance than they do from knowledge of results. Another recent study conducted by Pellet and Harrison (1995) also indicated that there was a positive effect for teacher-specific, congruent and corrective feedback on the immediate practice trials' success of middle-school girls in volleyball lessons.

Recently, Behets (1997) showed that there were differences in feedback patterns between more and less effective teachers. He found that the more effective teachers gave more corrective feedback. They had more practice time and therefore were able to give more feedback.

Physical education researchers also proved that teacher feedback serves other functions that help learning. Van der Mars (1989a) indicated that teacher praise could minimize the off-task behaviours of students when he studied second-grade students. Another research investigation done by Sariscasany, Darst and Van der Mars (1995) verified that students who received higher rates of specific skill feedback generated higher rates of on-task behaviours.

However, some conflicting results have been reported in other studies. Salter and Graham (1985) and Silverman, Tyson and Krampitz (1992) reported a

low, non-significant relation between the total amount of feedback provided by the teacher and student achievement. Yerg (1981) even found that informative feedback negatively affected student achievement.

By analyzing other case studies, other researchers discovered that more effective teachers and coaches did provide specific and corrective feedback that was congruent to a task focus (DeKnop, 1986; Gusthart & Springings, 1989; Markland & Martinek, 1988; Werner & Rink, 1989). In fact, the process of student learning may be affected by many variables simultaneously. Teacher feedback may only account for a small percentage of the learning variance (Silverman, Tyson & Krampitz, 1992). Other variables such as skill levels of the students and task organization and explicitness may also have an impact on learning in physical education (Rikard, 1991; Rink, 1994; Silverman, Kulinna & Crull, 1995; Silverman, Tyson & Krampity, 1993; Silverman, Tyson & Morford, 1988). It seemed that various process variables were interrelated and that perhaps a single variable should not be considered in isolation of other variables.

Nevertheless, from the various research findings on teacher feedback and student achievement, results generally support the notion that teacher feedback has played a part within the instructional process and enhances student learning.

Teacher Management

Classroom management is essential to effective teaching. It is commonly agreed that effective teachers must be good managers, but good managers are not necessarily effective teachers. In the past, Doyle (1986a) regarded classroom management as a process of obtaining and maintaining order in the classroom. Recently, educators have changed their views that achieving effective classroom

management is by negotiation, responsibility, as well as creating supportive learning environments (Everston & Harris, 1992; McLaughlin, 1994).

In physical education, the learning environment is regarded as the behavioural conditions in the gymnasium, sports field or swimming pool (Ratliffe, Ratliffe & Bie, 1991). Rink (1998) identified that the two major aspects of the management of learning are: 1) teacher behaviours and strategies designed to affect and control the conduct of students; 2) the organizational aspects planned and implemented by the teacher, such as time, space, equipment and student placement. It is obvious that to maintain and develop a learning climate as well as good class organization are the two major tasks of teaching physical education.

According to Rink (1998), effective physical education teachers usually establish and maintain a learning environment conducive to learning. They possess the ability to structure the class and design learning experiences to produce maximal gains in students' achievements. They all are good managers because management skills are a prerequisite for effective teaching (Rink, 1996, 1998).

As to establishing a good learning environment for learning, Rink (1998) emphasized that the teacher should minimize the amount of class time spent in non-practice activities in order to provide an opportunity for the maximal quantity of practice attempts and the development of accountable academic tasks over time. Others also agreed and describe the characteristics of effective classroom managers. They monitor student behaviours, develop systems and methods of holding students accountable for their work, present information clearly and organize instruction so that more time is spent on "academic tasks rather than nonacademic tasks" (Emmer, Evertson & Anderson, 1980; Evertson & Emmer,

1982).

Participation with much practice is important to learning motor skills. Faucette and Patterson (1990) found that once students understand the tasks to be learned, they need ample opportunities for practice or engagement of activity time. Therefore, class routines that reduce management behaviours must be employed in order to provide more practicing time for students.

In a study conducted by Parker (1995), experienced physical education teachers also believed that the essential element in effective teaching was effective classroom management. They supposed that lesson goals, class organization and a management scheme were related to student achievement. Belka (1991) pointed out that organization might be a more important factor in determining overall class quality in physical education lessons, since poor organization usually had a negative impact on the student learning situation and encouraged poor student behaviour.

Physical education researchers indicated that teachers who developed routines, rules and expectations at the start of the school year with their class reported better academic achievement and attitude by the students throughout the year (O'Sullivan & Dyson, 1994). Therefore, Fink and Siedentop (1989) encouraged teachers to enforce and practice a more authoritarian approach with rules and routines relating to safety, warm up routines, use of equipment, appropriate dress and paying attention in physical education classes at the beginning of the school year.

Downing (1996) also supported the importance of maintaining an organized structure within physical education classes in order to increase time on-task and achieve effective instruction. Oslin (1996) studied the routines in middle-school

physical education and added that routines were only effective if they were clearly presented, using specific examples of appropriate and inappropriate behaviour and specific consequences for noncompliance. Maintenance of routines appeared to be dependent upon immediate and consistent application of consequences for noncompliance, prompts and praise for compliance.

In all, effective physical education teachers produce a learning environment by using management strategies which enhance students' learning. Nonetheless, Rink (1998) warned that management in physical education classes might have a problem in decreasing student learning time. It is likely that how physical education teachers spend time during their teaching would affect student learning.

2.5.3 Time is a Variable in Effective Teaching

It is believed that students learn more when they practise more during a physical education lesson. Time becomes an important factor in teaching physical education. Effective teaching will depend to a certain extent how the teachers allocate time for students to practise in appropriate tasks. Since teachers are fully in control of the time allocation during the instructional process, examining how physical education teachers spend their time in gymnasium will help to know more about effective teaching behaviours. Teacher instruction time and teacher management time are the two common time variables that the researcher would like to look into.

Teacher Instruction Time

Teacher instruction time is defined as the time the teacher uses in presentation, monitoring and providing performance feedback to the students

(Phillips & Carlisle, 1983). Studies in general teaching and physical education have indicated that an increase in instruction time significantly improved student achievement (Carlisle, 1981; Evertson, Emmer & Brophy, 1980; Good, 1979).

However, some other researchers have not found a significant relationship between increased teacher instruction time and improvement of student achievement (Brophy & Evertson, 1974; Fisher et al., 1978; McLeish, Howe & Jackson, 1981; Yerg, 1981). It appears that some other variables might also affect student learning.

Although the relationship between teacher instruction time and student achievement is inconclusive, physical educators revealed that most of the physical education teachers spent over two thirds of the time in instructional behaviours during teaching. Researchers reported the total instructional time range from 70.89% to 79.96% (Curtner-Smith, Kerr & Hencken, 1995a; Laker, 1994; Smith, Kerr & Wang, 1993). It seems that there is a common pattern of instructional behaviours in any population of physical education teachers.

Teacher Management Time

Teacher management time is regarded as the time devoted to organization and transition before, during and subsequent to a teaching lesson (Phillips & Carlisle, 1983). Beginning and ending class, class organization, equipment organization as well as student behaviour management are within this category.

The teacher management time will affect student achievement. Researchers in physical education and other fields have reported that the decrease of management time can improve student engaged time and enhance student achievement (Emmer & Evertson, 1981; Godbout, Brunelle & Tousignant, 1983;

Good, 1979; McLeish, Howe & Jackson, 1981; Phillips & Carlisle, 1983). Some investigators also indicated that more effective teachers spent less time in management and increased student's engaged time compared to less effective teachers (Englert, 1983; McLeish et al., 1981).

In a real classroom situation, teachers spend some considerable time in classroom management. Researchers have indicated that the specific teacher management time within the total class time ranges from 19%-52% (Curtner-Smith, Kerr & Hencken, 1995a; Godbout, Brunelle & Tousignant, 1983; Lacon & Curtner-Smith, 1998; Laker, 1994; Phillips & Carlisle, 1983; Shute, Dodds, Placek, Rife & Silverman, 1982; Smith, Kerr & Wang, 1993). Most physical education teachers on average spent almost one third of the time in classroom management.

On the whole, physical education teachers seem to hold a certain time pattern of their teacher behaviours in the gymnasium. Metzler (1989) reviewed over 50 studies of the time variable in physical education teaching and concluded by describing some patterns of teaching behaviours of physical education teachers: a) physical education teachers usually spend 25% to 50% of class time in non-productive activities, b) there was no plan or design of the teachers to maximize student participation, c) there was quite a wide time range that teachers spend in class activities, d) students only spend 20 to 50% of their time in engaged skill learning, e) the time range which students spend for skill learning varies, f) student learning time varies with activities in which students are engaged, and g) students spend a low percentage of engaged skill learning time consistently in physical education classes. This review generated some insights into the how American physical education teachers were doing in the gymnasium. However,

it seems that they were not teaching well in their classes.

Since the relationship between teacher instructional time and student achievements is inconclusive, educators come to realize that student learning time may relate to their own achievements. Student learning time becomes an important variable in effective teaching.

Student Learning Time

Student learning time in the physical education context refers to the time students spend on learning motor skills and these times are usually spent in the mode of practicing. This time variable is also believed to be closely related to student achievement in process-product studies. Researchers have studied whether changing teacher behaviours can improve student learning time and its relationship with student achievement (Pease, 1984c; Phillips & Carlisle, 1983). They reported that the amount of engaged skill learning time has a significant relationship to both teacher behaviour and student achievement. Moreover, some physical educators have shown that the most effective teachers provided over twice the amount of engaged skill learning time for their students than the less effective teachers (McLeish et al. 1981; Phillips & Carlisle, 1983).

In fact, the time students spend in learning motor skills has been reported in many ways: motor engaged time, engaged time, functional time, active learning time, time on task and academic learning time in physical education. All these terms have been found to be positively related to student achievement (Lee, 1996; Metzler, 1989). Out of all these terms, motor engagement time and academic learning time in physical education are the two most commonly used in physical education studies. Process-product research has established a positive

relationship between student engagement and learning, meaning that the more time students spend in appropriate tasks, the more likely they are to achieve (Rink, 1996).

Physical educators point out that a number of variables can influence student motor engagement time in physical education. Teacher's class organizational skills and management techniques are the major important factors (Borys, 1982). A high motor engagement time physical education class usually exhibits the following characteristics: maximal use of available equipment, reduced student waiting time and smaller student groupings; leading to more student practise trials.

Chao (1987) also found that the student motor engagement time varied between teaching activities and was different across student gender, grade level, teacher gender, class size, facility used and class segment in his study of student behaviours in physical education classes in Taipei City. Moreover, Harrison (1987) reported that motor engagement time should not be used exclusively to assess teacher effectiveness since it is possible to have a highly active environment in physical education without performing the task properly.

Academic learning time in physical education is another common term being used to describe the time students spend learning motor skills. It was defined as the time students were motor engaged in an activity performing at a high rate of success (Metzler, 1979). Academic learning time in physical education was accepted as a proxy variable for student learning, meaning that measurements of ALT-PE could be substituted for measurement of learning. This is based on the assumption that students could learn more when they had more ALT-PE. The teachers that provided more ALT-PE were more effective because their students

would learn more. This assumption was attractive but it should be cautioned that students could practice wrongly even they were 'on-task' practicing. Therefore, ALT-PE needed certain conditions to be met before it could be stated that more ALT-PE led to be more skill learning. According to Harrison (1987), the effectiveness of research that used ALT-PE is contingent upon the assumption that ALT in physical education correlates with student achievement as it does in classroom subjects.

In a review by Siedentop, Mand and Taggart (1986), the dismal findings of the ALT-PE studies were contextualized. Students only spent 30% of class time at best engaged in motor activity, which was an unexpectedly lower figure in student engagement time than ever before.

Many experimental studies focused on manipulating specific teacher behaviours have proved to increase student engagement time and ALT-PE (Berkey, Wiegand & Hawkins, 1986; Griffin, Mancini, Wuest & Frye, 1986; Ratliffe, 1986). These results provide important insights related to how teachers and students spend class time. These findings demonstrate that teachers can be taught to become better managers of time and how teachers spend their time in the classes has a direct impact on how students learn in class. In other words, if a teacher spends less time engaged in managerial behaviours, more time is available for instructional behaviours, which, in turn positively influences student engagement time and ALT-PE.

2.5.4 Summary

Educational researchers have long been interested in conducting research into teaching effectiveness. The major aim of these researchers is to improve the

teaching and learning process in classroom settings. This section has provided an overview of effective teaching behaviours within the classroom and gymnasium settings. Previously, educators have been trying to identify the context-specific variable related to effective teaching. As teaching is contextual in nature and taking place in a complex environment, teaching variables identified relating to effective teaching should not be interpreted separately to other variables. Furthermore, though direct instruction has been proved to be an effective teaching strategy, one educator argues this strategy may not be appropriate to teaching subject matter that is not structured and requires higher order thinking skills (Rink, 1998). It is likely that effective teaching is not “one size fits all” and closely related to the teacher’s experience, knowledge and context. Nevertheless, how the teachers behave in classrooms influences student learning. There is supporting research evidence demonstrating that teachers’ instructional techniques, feedback and management skills associate with effective teaching in both classroom and gymnasium settings.

Time allocation is also an essential factor for effective teaching. It is apparent that how the teachers allocate time for students to practise appropriately in the gymnasium will influence their learning. All in all, there seems to be some “desirable” teaching behaviours and factors for effective teaching. Educators think that they are able to identify these characteristics in the teaching experts. Therefore, there is a need to understand more about expertise in teaching. In the following section, the review will pay special attention to the issue of teaching expertise and expertise in teaching physical education. As teaching experience is identified as being an essential characteristic of teaching experts, studies related to the teaching experience variable, conducting in the

expert- novice paradigms, will be reviewed and the major findings will be discussed.

2.6 Expertise/Experience and Novice

Educators have been interested in understanding what a teacher needs to know and do in order to be considered an expert professional. They attempt to identify the characteristics of teaching expertise. The general idea is to use this knowledge information to help beginning teachers reach that stage more quickly and behave like the experts. Then what is expertise? What is teaching expertise? What is teaching expertise in physical education? The following paragraphs will try to discuss and address these questions and related issues. As teaching experience is the major feature possessed by the teaching expert, the later part of this review section will concentrate on this variable and discuss its relation to teaching effectiveness.

2.6.1 What is Expertise?

When someone is identified as an expert in a field, he or she usually is knowledgeable pertaining to their specific field and can apply this knowledge in a performance that seems effortless. However, the question of defining expertise has been a common debatable issue for years.

Early work in defining expertise involved the comparison between experts and novices in problem solving activities, such as physics problems and chess play. Glaser (1985) summarized the results and pointed out that the expert knew how to apply the knowledge where the novice might lack the talent for the application of the knowledge. He used the term “schemata” to explain the

organization of knowledge developed by experts. Schema is defined as a modifiable information structure that represents generic structures of concepts stored in memory. Schemata are the products of the knowledge that have been experienced during situations and events. Schemata develop over time with practice and help people to represent specific situations in general ways and predict the outcomes or solutions. Schemata theory appears to be the underlying theoretical explanation for the differences between behavioural and cognitive expertise and novices (Anderson, 1977, 1982). Researchers argued that the qualitative performance differences between experts and novices in chess players, bridge players, physicists and medical diagnosticians were attributed to different development of schemata in experts and novices (Chi, Feltovich & Glaser, 1981; Chi, Glaser & Farr, 1988; de Groot, 1965). The highly detailed interconnected developed schemata in experts allow them to operate with full access to previous experience cached in memory. Their cognitive knowledge is highly developed, richly elaborated and stored for access when needed (Berliner, 1992; Borko & Livingston, 1989; Peterson & Comeaux, 1987).

Psychologists agreed that expertise appears to germinate from a set of characteristics and develops with practice and experience (Ericsson & Charness, 1994). Pioneering work of de Groot (1965) studying the expert performance of chess players also demonstrated that superior playing skills of chess players were attributable to extensive experience and these in turn allowed for retrieval of direct memory associations between chess positions and appropriate moves.

In an article identifying the major elements of expertise, Tan (1997) highlighted that the excellence gained by the experts is crafted by extensive knowledge and skills that are built up over years of experience. Chase and

Simon (1973) estimated that chess players roughly took more than ten years of intense preparation and practice to become experts. In a review of the role of deliberate practice in the acquisition of expert performance, Ericsson, Krampe and Tesch-Romer (1993) also agreed that expertise performance is actually the result of intense practice extended over a minimum of 10 years. Perhaps there is no short cut to expertise. However, experience alone is not sufficient for developing expertise (Lesgold, Robinson, Feltovich, Glaser, Klopfer & Wang, 1988; Siedontop & Eldar, 1989). Some people never attain higher performance levels even though they actively engage in their popular activities. Some may achieve expert performance by undergoing periods of active learning. They refine their skills and knowledge under the supervision of a qualified teacher or coach (Ericsson & Charness, 1994).

Glaser and Chi (1988) suggest that expertise in one domain does not generalize readily to other domains. This is because the experts are only knowledgeable about a particular field and eminently skilled in the application of that knowledge in some specific environment. Years of experience and familiarity with a specific environment has led experts to repeat behaviour patterns into subconscious automatic routines. Therefore, extensive practice is a prerequisite in developing the automaticity of expert performance.

2.6.2 What is Teaching Expertise?

Educational researchers also strived to identify expertise in their profession. The major goal of identifying the characteristics of master teachers is that it will serve as a model to teach teachers. The beginning teachers will endeavour to develop these characteristics as a major reference. Berliner (1988a) proposed

five stages of skill learning and development of teachers as mentioned previously. He attempted to list the characteristics of teachers at various levels of expertise. He agrees that experts have an intuitive grasp of the situation with a fluid performance that seems effortless. By highlighting that experience and expertise are not interchangeable, Berliner (1986) cautions that experience does not necessarily grant expertise.

Some researchers believe that experts are context specialized and expertise in one domain does not generalize readily to other domains (Glaser & Chi, 1988). This also applies to teaching expertise. Bullough and Baughman (1993) suggested that the acquisition of expertise “is more a process than an end state,” (p. 461), therefore, they adopted a longitudinal approach and traced the evolution of a teacher’s expertise in two related singled-subject case studies. At the time of the first study, the subject was in her fifth year of teaching in a middle- to lower-middle class school district where she was highly regarded as an expert pedagogue. Bullough and Baughman (1993) described her teaching performance as effortless and automatic, which are major characteristics of teaching expertise.

In the second study, Bullough and Baughman (1995) sought to determine to what degree change in instructional context would affect the subject’s teaching expertise. Having relocated to an urban, ethnically diverse school committed to cross disciplinary education and mainstreaming, the subject was required to make adjustments in her teaching. According to the interview of the subject’s new building principal and analysis of the data collected in the second study, results revealed that the subject was no longer an expert. The subject spent a large amount of time planning, relegating her to almost novice like status. Bullough and Baughman (1995) underlined both the multidimensionality and context

specificity of expertise as manifested in the findings of their case studies.

2.6.3 What is Expertise in Teaching Physical Education and Sports?

Siedentop and Eldar (1989) attempted to identify the typical features of teaching expertise by investigating seven effective elementary physical education teachers in their study. Several views of expertise in teaching physical education emerged: 1) Teaching expertise is very specific to context and subject matter, 2) Expertise in teaching combines high degrees of teaching skills with a high level of subject matter knowledge, 3) Expertise in teaching is performance oriented, and experts' performance is different from that of an effective teacher, 4) Experience contributes to expertise but does not guarantee expertise. Teaching expertise was "primarily a function of a high degree of subject matter competence blended with the experience of having taught that subject matter to children for many years" (Siedentop & Eldar, 1989, p. 258). They further provided some behavioural characteristics of these teaching experts. "The expert is under considerably more complex stimulus control, with a larger, more highly differentiated response repertoire, and with a stronger control from setting events relative to the subject matter as applied to a particular context (p. 260).

Later, Dodds (1994) also tried to outline the cognitive and behavioural components of expertise in teaching physical education. She depicted experts as top performers in a single domain and who were highly motivated to learn. They learned more than other people from their experiences. Their knowledge can be assessed and used appropriately in unfamiliar situations. Their performance is contextually fluid, relevant and automatic and does not require conscious thought. Moreover, Dodds pointed out that personal ability in sport activity was not a

prerequisite of teaching expertise in physical education and there was little evidence directly relating athletic skills to teaching expertise. The major behavioural skills of expert physical educators are the ability to analyze motor skills and their greater flexibility in teaching. Dodds also suggested the essential cognitive characteristics of teaching expertise in physical education. The expert physical education teachers usually possess the ability to describe classroom events in more detail and their knowledge is more organized, detailed and coherent.

Others physical educators also call for the clarification of the definition of expertise in teaching physical education. Pieron and Carreiro da Costa (1996) argue that besides considering the behavioural component of the expertise, the values in their thoughts and decision making processes during teaching are needed to be looked into. They suggest that cognitive psychology and specially information processes theory are the sources and direction that may help to identify criteria of effectiveness and analyzing expert teachers. Ennis (1994a) states that curricular expertise is a requirement for a teacher to be considered as an expert in teaching. She believes that having a broad understanding of the subject matter base will help teachers to apply this knowledge into appropriate content for student learning. Ennis further claims, “Curricular expertise results from blending knowledge and beliefs to form a commitment to student learning” (p. 175). O’Sullivan and Doutsis (1994) add that expert physical education teachers do not only possess sophisticated knowledge in their subject matter but also “demonstrate in their culturally relevant physical education programs and socially responsible teaching a knowledge of and sensitivity to the uniqueness of their learners and their cultural contexts” (p. 179).

In summary, evidence indicates that physical education teaching experts have high, explicit knowledge in both subject-matter and the pedagogical domain. This superior knowledge enables them to make sense of and interpret classroom phenomena so as to provide effective and flexible instruction. They are more capable at understanding and describing classroom events in-depth in order to identify problems and make appropriate decisions. As they are more sensitive to the classroom environment, they adapt the lesson and alter their plans to meet the needs of the students. The expert teachers are better in monitoring instructional activities and management issues. It is likely that extensive and varied teaching experience and a rich store of classroom knowledge contribute to the expert teachers' superb classroom behaviours.

2.6.4 Experience and Effectiveness

Educators have long been aware that instructional experience might closely link to effective teaching. Two major research approaches focusing on experience have been conducted. First, investigators studied the influence of training, feedback and field experiences on teaching behaviours or skills (Gliessman, 1984; Watts, 1987; Waxman & Walberg, 1986). They assumed that certain basic teaching skills were best learned through directed laboratory practice and extensive practical experience in "real" settings. The second approach focused on personality or development perspectives and specifically addressed the effects of experience on attitudes, motives and concerns (Fuller, 1969; Hoy, 1968; Wright & Tuska, 1968). Findings from these studies were unfortunately impoverished. They only provided sketchy information about the influence of experience on teaching. Thus, some further studies were carried out utilizing

both qualitative and quantitative methods to examine how the teaching experience influenced the practice of classroom teachers over a long period of time, however, the results were also inconclusive.

Adams (1982) studied the change in perceived problems, concerns and classroom behaviours of 152 student teachers over a six year period, only 53 of the subjects remained as fifth year teachers. Adams concluded that there was little change in teachers in perception of discipline, student motivation, concern for students' and style of teaching. However, there was an increase in affective teaching behaviours and in organized/systematic teaching behaviours between the first and the third years.

Ayers (1986) examined 600 teacher education graduates over a thirteen year period for the first three years of their teaching. The findings indicated that some teachers had improved their teaching skills, especially in terms of management strategies, after three years of time.

Mays (1989) investigated the beliefs and teaching practices of 6 different teaching experience physical education teachers in relation to the professional preparation program and the viewpoint of physical education teacher educators. The results showed that the professional beliefs of the teachers were mostly consistent and their current teaching practices were similar to the practices advocated by the teacher preparation programme, with most teachers making "minimal changes" in teaching because of the changes of beliefs and priorities. Mays noted the factor of the teaching environment had affected some of the teachers to change their professional beliefs as well as their practices.

Researchers have identified that the school teaching environment might have influenced the teaching proficiency of the physical education teachers. Dodds

(1994) commented,

the gymnasium environment...(and) the school culture at large impose (such) restrictions on what teachers can accomplish ... (that) school physical education may not provide a reasonable workplace in which truly expert teachers can develop. (Dodds, 1994, p. 163)

Moreover, the findings of some socialization studies also support that the effects of the work place have changed teacher effectiveness in physical education. Several researchers have shown that teachers in the course of their student teaching and during their induction year become increasingly custodial, and more concerned with control and discipline, as well as feeling less responsible for student learning (Arrighi & Young, 1987; Schempp, 1986; Templin, 1979, 1981). Other studies revealed that practising physical education teachers prefer to keep students happy and busy, with low levels of misbehaviour, and regard having positive student responses as successful teaching (Arrighi & Young, 1987; Placek, 1984). Zeichner and Tabachnick (1981) explained the “wash out effect” of teacher education was due to novice teachers coping with the reality of the teaching environment.

On the contrary, there is still some evidence that practising teachers do hold beliefs and exhibit teaching behaviours instilled by their teacher education programmes. Findings in classroom studies showed that school teachers had incorporated principles and methods from their teacher education courses by improving their teaching behaviours and strategies after a few years of teaching (Adams, 1982; Bullough & Baughman, 1993). Studies in physical education also generate similar results. Some first year physical education teachers could demonstrate veteran level classroom management behaviours and experience no

reality shock, while some even proceed and develop into experts (O'Sullivan, 1989; Sharpe & Hawkins, 1992). Nevertheless, the evidence in physical education research points to the fact that the in field teaching experience generally produce effects on physical education teachers' thinking and instructional behaviours. It is likely that the socializing events in school might gradually alter the ways physical education teachers teach. In other words, school teaching experience has influential effects on teaching behaviours.

As mentioned previously, expertise is developed through experience and practice but the fact is that not everyone may become an expert in the end. Thus, researchers also applied the novice-expert research methodology paradigm and examined the distinctive features of experienced teachers. Results of these studies revealed that there were differences in cognitive abilities and teaching behaviours between the experienced and the novice teachers. Summary of some of these studies findings is presented in Table 1.

On the whole, studies in both general education and physical education have demonstrated that teachers with more teaching experience had comparatively better teaching performance than those with less classroom or field practice.

Table 1.
Summary of the Findings of Studies of Cognitive Abilities and Teaching
Behaviours between Experienced and Novice Teachers

Authors	Purpose	Major Findings
Leinhardt (1983)	Studied the thought processes of experienced and novice teachers in teaching.	No significant difference between novices and experts in estimating tasks that had been taught, but experts were able to answer according to the knowledge of the students and of the curriculum.
Allen & Casbergue (1995)	Examined the recall abilities of novice, experienced, and expert teachers in classroom events.	A negative correlation between number of years of experience and number of recall errors.
Needels (1991)	Studied the responses of student teachers, first year teachers, and experienced teachers to view a videotape of a first grade teacher teaching a language arts lesson.	There was differences in observations of beginning and experienced teachers. The experienced teachers better understood the interconnections of classroom events.
Mostert & Nuttycombe (1991)	Examined second and fourth year elementary and secondary education major's observation skills.	The more experience pre-service students had the better their observation ability than their inexperienced counterparts in lower classes. They gave more specific criticism of the lesson and demonstrated more objectivity, linking their perceptions to the teaching process rather than the teacher.
Behets (1996)	Compared the observation skills in teaching situations among experienced PE teachers, first- and last- year PE student teachers.	The last-year students and experienced teachers correctly reported more critical events on the slides scenes than first year students, but there were no differences in observational capacities between the last-year students and experienced teachers.

Authors	Purpose	Major Findings
Yon (1991)	Analyzed the power and problem solving abilities between female student teachers and prospective student teachers.	The experienced student teachers had a better understanding of classroom problems, generated better problem solution connections and identified more aspects of effective teaching than prospective student teachers.
Levin (1993)	Studied the analyzing power of experienced and novice teachers.	The experienced teachers' thinking and understanding was more elaborated, conditional and contextualized, while the less experienced teachers displayed declarative, critical and less explicit or complex thinking.
Galvez-Martin (1997)	Examined the reflective ability of the experienced and inexperienced teachers.	The in-service group achieved a higher level of reflection than the pre-service group, even though they received no training on reflective thinking.
Tan, Fincher, Manross, Harrington & Schempp (1994)	Explored the differences between competent and novice teachers' knowledge of teaching physical education.	Specific differences existed between competent and novice teachers in assessing student learning difficulties, conceptions of knowledge, and reflective practice.
Fortin (1992)	Studied the knowledge, values and teaching behaviours of two experienced modern dance teachers.	The dance teachers possessed "highly idiosyncratic" pedagogical content knowledge and could demonstrate a variety of instructional strategies. These abilities were due to their strong background in dance performance, formal dance education as well as personal history of dance classes.
Housner & Griffey (1985)	Analyzed the decision making processes employed by experienced and pre-service elementary physical education teachers.	Experienced teachers made more decisions regarding the implementation of teaching strategies, concentrated more on individual student performance, and possessed better content knowledge and managerial insight than did the beginning teachers.

Authors	Purpose	Major Findings
Griffey & Housner (1991)	Compared the teaching and planning behaviour exhibited by experienced and inexperienced teachers during instruction.	Markedly different patterns of planning, interaction and student engagement were found for inexperienced and experienced. Experienced teachers elaborated managerial plans for implementing tasks with children. They entered the instructional situation with contingency plans. Their classes were more business like and focused on content and student mastery.
Stroot and Morton (1989)	Investigated the planning strategies and the teaching behaviours of elementary physical education teachers.	Beginning teachers were more plan dependent and keeping their plans with them when teaching. Veteran teachers were more independent in their teaching and only used the plans as a reminder or review.
Graham, Hopple, Manross, & Sitzman (1993)	Investigated the situational decision making process of experienced and novice elementary physical education teachers.	Experienced teachers prepared their lessons primarily on their experiences and rarely used books and materials and presented fewer tasks but with a greater number of cues and refining tasks than the novice teachers. While the novice teachers utilized more extending tasks and tried to cover the material.
Cardoza (1989)	Studied the teaching behaviours of student, novice and experienced physical education teachers in elementary classes by using the Teacher Performance Criteria Questionnaire (TPCQ).	There were no significant differences in teacher-student interaction patterns. However, experienced teachers were the most effective, interactive with students and they scored significantly higher in variability, structuring and summary comments.

Authors	Purpose	Major Findings
Fink & Siedentop (1989)	Investigated how the beginning and veteran physical education teachers developed rules , managerial routines and performance expectation at the start of the school year.	The overall pattern the teachers used to establish the routines was very similar and differed only in the amount of behaviours directed toward student behaviour in these routines.
Tan (1996)	Analyzed the feedback patterns and perceptual maps of experienced and inexperienced teachers.	Inexperienced teachers did not differ from experienced teachers in their feedback structure, but there were differences in their perceptual patterns.
Tam (1997)	Examined the instructional activities of trained and experienced teachers and untrained and less experienced teachers in the Hong Kong school classroom setting.	The experienced teachers outperformed the less experienced teachers in both teaching and management skills although they adopted a similar teaching approach.
Ha (1996)	Examined the feedback pattern of forty pre-service and in-service Hong Kong secondary school physical education teachers by using the Self-Assessment Feedback Instrument (Mancini & Wuest, 1989).	The in-service group had significantly higher percentages of using teaching feedback of praise, praise/re-instruct and questioning than the pre-service group.

2.6.5 Summary

The findings of both the studies related to teaching experience and instructional practice and the studies of expert-novice paradigm comparing experienced and novice teachers in general education and physical education were reviewed and indicated that experience could change a teacher and in turn might help his or her teaching more effectively. Results of most studies revealed that there were differences in overall teaching performance between the most and least experienced teachers. However, it is also true that experience does not teach

everyone equally well and many have not profited from it. This is why some experienced teachers did not always act in ways we thought they might. If they could remain motivated and reflective they are likely to be transformed by their experience into more effective teachers! It is likely that through substantial classroom experience and reflection, teachers will gain more knowledge and improve their practice. If teaching changes one's knowledge and classroom practice, it is worthwhile to understand more about teacher knowledge and its relation to classroom teaching. Therefore, the last section of this review chapter is to provide a review of the literature on teacher knowledge and teaching.

Based on the literature reviewed in this section, the investigator assumes that the in-service student teachers with more teaching experience in the present study teach differently from their less experienced pre-service counterparts, since experience can change one's teaching.

2.7 Teacher Knowledge and Teaching

Traditionally, people thought what teachers needed to know in teaching was basically what they would teach. This implies that teachers need subject matter knowledge to teach. It is likely that teachers need certain knowledge in order to teach well, however, this kind of knowledge is not clearly defined.

Effective teachers are assumed to possess knowledge of the subject matter to be taught as well as having a thorough understanding of how to deliver that subject matter to students. Previous research on teaching mainly focused on managerial and instructional skills and teacher knowledge did not receive much attention prior to the 1980s (Carter, 1990). When educational researchers came to be aware the roles of knowledge in teaching in the early 1980s, they exhibited

mounting interest in this area.

Researchers have considerably expanded the concept of teacher knowledge, and employed various terms, such as “knowledge base for teaching”, “professional knowledge”, and “practical knowledge”, and developed different models to explore what knowledge teachers need for effective teaching.

This section presents a review of the literature on teacher knowledge and practice. First, the concept and different terms of knowledge will be introduced. Second, the concept of how teachers acquire knowledge is discussed. Lastly, the roles of subject matter knowledge, pedagogical knowledge and pedagogical content knowledge in relation to general teaching and physical education will be provided.

2.7.1 Forms of Knowledge

There are broad definitions of “knowledge” related to how it is used in different contexts. Indeed, there has been incongruent use of the term “knowledge” in both the field of education and cognitive science. Alexander, Schallert and Hare (1991) identified more than 25 labels applied to knowledge that have been addressed by various researchers. They have given different labels to similar types of knowledge to imply differences where there are none, as well as failing to distinguish between differences among differing types of knowledge. The literature on teaching is full of these labels but they are arbitrary in nature. Anyhow, the literature is clear that these different forms of knowledge are important to teaching. As individuals gain experience in a domain, growth occurs in terms of different forms and types of knowledge (Calderhead, 1987b; Hollingsworth, 1988).

The investigator will discuss various types of knowledge involved in teaching (e.g., content knowledge, pedagogical knowledge, etc) in the following section. Within each type of teacher knowledge the following forms may be present.

Declarative knowledge. Declarative knowledge has been defined as “knowing what” or “knowing that” (Anderson, 1983). It is the domain-specific, factual content residing in long-term memory. A person may have declarative knowledge of almost anything and yet not be able to use the knowledge in carrying out a task. Examples of this type of knowledge in physical education: knowing the correct parts of the fingers used in basketball shooting; where to position oneself when playing offensive in football game; and knowing why active supervision is important in teaching motor skills.

Procedural knowledge. Procedural knowledge has been defined as “knowing how” (Anderson, 1983). It includes cognitive processing strategies that are used to perform actions or operate on the declarative content. This form of knowledge is said to be in a series of “if-then” rules. Researchers have argued that declarative knowledge is the substance from which procedural knowledge is developed. Thus, one has to “know” it declaratively before learning to apply knowledge (Bereiter & Scardamalia, 1986; Thomas & Thomas, 1994). Educators sometimes define procedural knowledge as pedagogical content knowledge (Shulman, 1987). The ability to teach forty students with various cultural and skill backgrounds how to dribble, shoot and play the game through a basketball lesson with ten basketballs in one basketball court with only two baskets, would represent this type of knowledge.

Conditional knowledge. Conditional knowledge is defined by Alexander and his colleagues (1991) as knowing when, where and if to apply declarative or procedural knowledge. This might involve knowing when to change teaching strategies during the teaching process.

Structural knowledge. Structural knowledge also serves as a bridge between declarative and procedural knowledge like conditional knowledge. According to Jonassen, Beissner and Yacci (1993), this domain of knowledge is knowing why and describes how declarative knowledge is interconnected. It also “mediates the translation of declarative into procedural knowledge and facilitates the application of procedural knowledge” (p. 4). This type of knowledge is related to proficiency in a domain. It is knowing how concepts within a given domain are interrelated (Diekhoff, 1983).

2.7.2 Types of Teacher Knowledge

The most common cited type of knowledge in the literature is that of content knowledge, also referred to as subject matter knowledge, or domain knowledge. Alexander et al. (1991) have defined content knowledge as the realm of knowledge that individuals have about a particular field of study. As most teachers identify themselves by a disciplinary or subject label, this type of knowledge is regarded as a necessity for all teachers. Feiman-Nemser and Parker (1990) stated that the “understanding of subject matter is a sine qua non in teaching” (p. 40). The content knowledge can be conceptualized as being declarative in nature.

Some researchers identified that this type of knowledge is acquired through study (Alexander et al., 1991), while others argued that certain aspects of this type

of knowledge are gained through experience (Leinhardt & Smith, 1985; Shulman, 1986). Nevertheless, content knowledge is considered to play important roles in the teaching process. Calderhead and Miller (1986) maintain that knowledge of content is essential for teachers to be enthusiastic about what they teach. It helps teachers to plan, evaluate, diagnose, address pupils' questions and deal with unexpected classroom events.

In physical education, content knowledge is composed of theoretical and practical components (Tinning, 1992). Practical knowledge is the various sports activities such as gymnastics or basketball, while the theoretical subject matter is those disciplines such as exercise science and biomechanics.

Aside from content knowledge, there are other types of knowledge that may be relevant to the task of teaching. In addressing this issue, there appear to be two major perspectives outlined in the literature. The first perspective, suggested by Leindhart and Smith (1985), involves two main types of knowledge, lesson structure and subject matter knowledge. They describe teaching as a cognitive skill made up of complex knowledge and interrelated sets of schemata or routines drawing on these two types of knowledge.

Lesson structure. This type of knowledge refers to general teaching skills and includes "the skills needed to plan and run a lesson smoothly, to pass easily from one segment to another, and to explain material clearly" (p. 247).

Subject matter knowledge. This type of knowledge is domain specific and is claimed to develop through experience. It is the basis upon which the teacher selects content and generates explanations through a process of goal selection and integration. Subject matter knowledge supports and constrains lesson structure and strongly influences how a lesson will be taught.

The second perspective is that of Shulman (1986, 1987) who defined seven categories of knowledge which constitute the knowledge base of teaching.

Below are some briefings of the different types of knowledge outlined by Shulman (1986, 1987):

Content knowledge. According to Shulman (1986), content knowledge means the ability of the teacher to arrange the conditions appropriate for a particular subject matter. It is knowledge that teachers possess about an area as well as knowledge of its structure. Shulman conceptualized content knowledge as having both substantive and syntactic structures in nature. Substantive knowledge means the facts and concepts of a subject where the syntactic knowledge is the ways and means by which the proposition knowledge has been generated and established. Shulman (1986) points out that content knowledge alone is not sufficient for teaching competence.

General pedagogical knowledge. This type of knowledge is not domain specific and is similar to general teaching skills as outlined by Leinhardt and Smith (1985). Shulman (1986) referred to broad principles and strategies of classroom management and organization that appear to transcend subject matter. Much general pedagogical knowledge would appear to be procedural, and gained from practice.

Curriculum knowledge. Shulman (1986) described this type of knowledge as the “the tools of the trade” for teachers. It refers to the materials and programmes of study available for each subject. This would include all the materials and resources which might be used to teach aspects of the curriculum, for example, video-tapes, films, books, discussion groups and so on.

Pedagogical content knowledge. It encompasses a combination of content and pedagogy. In other words, it refers to all the aspects of the content relevant to its teachability. Shulman (1986) defined this type of knowledge as going beyond subject matter knowledge. It is knowledge of “the ways of representing and formulating the subject that make it comprehensible to others” (p. 9). This knowledge consists of useful forms of representations for the subject matter content knowledge such as analogies, illustrations, examples, explanations, demonstrations, learning cues, drills and so on. It has been called subject-specific-pedagogical knowledge by Reynolds (1992). Tinning (1992) described it as the knowledge concerned with how to teach the subject matter content knowledge.

Knowledge of learners. It consists of different elements: empirical knowledge of learners and cognitive knowledge of learners. Examples of empirical knowledge of learners are: knowledge of what a particular age range of children are like; their social nature; their classroom behaviours; their interests; how contextual factors affect their learning and behaviours; and the nature of their relationship with the teacher. Cognitive knowledge of learners consists of two elements. First, there is the knowledge of theories of child development which informs practice. The second element is context-bound to a particular group of learners: of what they know and of what they can do. This knowledge helps to provide differentiated adaptive activities and representations for the needs of learners of differing abilities.

Knowledge of educational contexts. This type of knowledge is of all the settings where learning takes place: of school, classrooms, nursery settings, university and colleges, and the broadest educational context of the community

and society (Shulman, 1986). As there is a range of contextual factors affecting teachers' development and classroom teaching, teaching contexts have a significant impact on teaching performance. This includes: the type and size of school; the class size; the feedback teachers receive on their performance; and the expectations and attitudes of the head teacher.

Knowledge of educational ends, purposes and values. As teaching is a purposeful activity, this type of knowledge contributes to pedagogical decisions and helps teachers have clear directions for their instruction. Expert teachers usually have explicit education ends which guide their thinking and planning in teaching.

Some other types of knowledge related to teaching have not been mentioned. One of these examples is conceptual knowledge. Post and Cramer (1989) described conceptual knowledge as "knowledge that is rich in relationship. It can be thought of as a connected web of knowledge, a network in which the linking relationships are as important as the discrete pieces of information" (p. 222). This type of knowledge is similar to structural knowledge as well as Leinhardt and Smith's (1985) schemas of classroom action. Another example although not being addressed, was case knowledge. Calderhead (1991) defined it as a "memorized repertoire of events or people which are highly significant for the kinds of task teachers face" (p. 272). It can assist teachers with problem formulation and also be treated as images that are capable of storing a large amount of complex knowledge of classroom situations. Leinhardt's situational knowledge is similar to case knowledge and includes knowledge or routines which are activities that teachers perform fluidly when confronted with a given situation (Leinhardt, Weidman & Hammond, 1987).

Other types of knowledge which emphasized the personal and tacit aspect of professional knowledge have been addressed by some researchers. Elbaz (1983) and Conle (1996) speak of practical knowledge and Clandinin (1985), Connelly and Clandinin (1986), and Tamir (1991) mention about personal-practical knowledge, which is the knowledge of the milieu of teaching, knowledge of subject matter, knowledge of curriculum development and knowledge of instruction and which develops through experience. These broad ranges of knowledge are essential to teachers as guiding their work when confronted with all manner of tasks and problems. While Kagan (1990) regards of personal-practical knowledge in terms of the “practical argument” as the reason for the way one acts in a given way.

In summary, there are various forms and types of knowledge involved in teaching and they are presented as discrete entities above. Despite the difference in researchers’ models in conceptualizing teachers’ knowledge, there exist two common essential kinds of knowledge, though sometimes termed differently, that is “subject matter knowledge” and “pedagogical knowledge”. This suggests these two types of knowledge are central of importance to teaching. Then, how do teachers develop this knowledge?

2.7.3 Developing Teacher Knowledge

The issue of developing teacher knowledge has in fact received little attention in recent studies on teacher knowledge or teacher professional development (Carter, 1990; Fenstermacher, 1994). Most studies related to this issue mainly focused on the influence of some particular source of teacher knowledge after attending a teacher training programme or educational course.

As mentioned above, although not specifically addressing teacher knowledge, Lortie's (1975) sociological study of school teachers drew attention to the effects of teachers' own experiences as school students on their perspectives of teaching. Students on average spent about 13000 hours in their school life observing their classroom teachers' teaching. This kind of close-up "apprenticeship of observation" provided them with an extended view of teaching. Lortie claimed that though this sort of knowledge about teaching was gained from a limited vantage point and relied heavily on imagination, it was not easily altered throughout the pedagogical training and was also hard to change by their later work experience.

Similarly, researchers found other personal experiences received before teacher training might influence their views on teaching. Book, Byers and Freeman (1983) found prospective teachers expected "on-the-job training" and "supervised teaching experiences" to be the most important sources for their learning to teach. Nearly 80% of the sample had first hand experiences with children as camp counselors, teacher aids, Sunday school teachers, and most had "played teachers" in their childhood recreation. Book and his associates pointed out that this kind of experience was a main source of the sample teachers' view of teaching as an extended form of parenting, and influenced their knowledge of teaching and expectations from education courses.

By using case study methodology, Grossman (1989) investigated the influence of subject-specific teacher education coursework on the development of English teachers' pedagogical content knowledge. She found that three beginning teachers with pre-service training and three without pre-service teaching training differed in their pedagogical content knowledge in terms of their

conceptions of teaching goals, content choosing and teaching strategies. She argued that pedagogical courses were helpful for the three beginning teachers to develop their pedagogical content knowledge.

On the other hand, McDiarmid (1990) highlighted that individual belief about teaching, learning, learners, subject matter knowledge were hard to change by a single course when he studied a group of prospective teachers attending a 4-week field experience.

Jones and Vesilind (1996) reported a study which investigated the changes of pedagogical knowledge of 23 pre-service teachers in middle-grade teacher education during the senior year. They found that student teachers reconstructed their pedagogical knowledge during the middle of student teaching, and they changed their concepts of flexibility and planning for teaching rapidly. The students attributed these changes in knowledge organization mainly to student teaching experiences. They argued student teaching had played significant roles in their learning to teach.

On the contrary, Shannon (1994) conducted a similar study that investigated the effects of university educational coursework and clinical experience on the development of pre-service teacher's knowledge. The results were totally different from Jones and Vesilind's. Shannon demonstrated that there was much support for the contribution of professional coursework to the development of pedagogical knowledge instead of student teaching.

In his dissertation, Garoutte (1980) also showed the effects of a special in-service training programme, which lasted about one year and consisted of a total of 100 hours of workshop session, on the pedagogical knowledge of 100 elementary teachers. From the data analysis, Garoutte concluded that the

in-service training programme produced a positive change in teachers' pedagogical knowledge.

Feiman-Nemser and Parker (1990) also found that novice teachers deepened their subject matter understanding with the help of experienced teachers. The novice teachers learned how to think about subject matter from student perspectives, how to represent and present academic content and how to organize students for the teaching and learning of subject matter. The beginning teachers could develop their subject matter knowledge and pedagogical content knowledge with the help of the mentor teachers.

Scholz (1995) somehow presented a different story from those of Garoutte and Feiman-Nemser and Parker about the influence of the in-service training programme on teachers' knowledge. Scholz found that the ways teachers had been teaching mathematics in the early grades, such as using worksheet, drill and practice, memorization, and flash cards, as well as their previous conception and knowledge structures regarding mathematics teaching were not changed significantly or influenced by the training programme.

Jones (1997) studied 69 pedagogically trained and untrained English and science teachers' classroom performances in Barbados, West Indies, where there is no pre-service training for teachers, and formal training is offered for teachers with two or three years teaching experience. Using statistical analysis, Jones found that there were no significant differences in the total performance score of the two groups of teachers, and their teaching pattern were similar too. He argued that it is probable "that the training programme is equipping teachers with skills which are so basic to successful teaching that untrained teachers quickly acquire those skills during the first or second year of teaching" (p. 183). The

result raised a question pertinent to this study, is teaching experience really a more important source of teachers' knowledge of teaching?

Although the results of the studies reviewed about this issue are inconclusive, in general, there are several characteristics in the relevant research literature on how teachers develop their knowledge. First, researchers have identified that each of the different kinds of sources, such as school experiences as students, pre-service training, in-service training and teaching experiences, influenced the development of teachers' knowledge. However, the relative value of these sources is unclear. Second, these studies are small-scale and the findings are less representative and depend more on specific contexts. This might be the reason why some studies' findings are inconsistent or even conflicting. Lastly, it seems clear that teachers continuously develop their knowledge during their whole professional life in order to teach effectively, but how does this knowledge influence their teaching?

2.7.4 The Importance of Teacher Knowledge

There is ample research evidence showing that a teacher's knowledge base has a profound effect on understanding, representing, solving or dealing with classroom situations (Calderhead, 1988, 1991; Carter, Cushing, Sabers, Stein & Berliner, 1988, Kagan, 1992). Teacher knowledge influences one's teaching. In terms of professional growth and accumulated classroom experience, knowledge of teaching would in turn develop as well.

Indeed, when investigating subject matter or content knowledge and pedagogical content knowledge differences between experts and novices in teaching (Carter, Cushing, Saber, Stein & Berliner, 1988; Carter, Sabers, Cushing,

Pinnegar & Berliner, 1987; Sabers, Cushing & Berliner, 1991), in all cases, the experts outperformed the novices in amount and detail of respective knowledge bases.

Educational scholars and teacher educators acknowledge that both teachers' subject matter knowledge and pedagogical knowledge are crucial to good teaching and student understanding (Buchmann, 1982; Doyle, 1986b; Feiman-Nemser & Buchmann, 1987; Reynolds, 1992). In addition to subject matter and pedagogical knowledge, Shulman (1986, 1987, 1988) has suggested that teaching expertise should be described and evaluated in terms of pedagogical content knowledge. Therefore, these three types of knowledge will mainly be focused on and discussed in the coming paragraphs.

Subject matter knowledge and teaching

Students understanding subject matter is the primary objective of teaching. Thus, the teacher must possess the knowledge of the material to be taught. When a teacher's knowledge is quantitatively measured in some studies, the results of these studies have consistently showed that there was statistically little relationship between amount of teachers' knowledge and teaching effectiveness in terms of students' scores on standardized tests (Begle, 1972; 1979; Copeland & Doyle, 1973; Eisenberg, 1977). Begle (1972) suggested that teachers may only need a certain amount of subject matter knowledge in teaching. Beyond a reasonable threshold, further subject matter expertise does not matter.

There is some empirical evidence support for the fact that a thorough grounding in subject matter is essential in the preparation of novices for teaching as well as the argument that subject matter knowledge makes a difference in

teaching (Hashweh, 1987). Hashweh (1987) examined the role of subject matter knowledge in teaching. He conducted an extensive study of three physics teachers' and three biology teachers' knowledge of science and the impact of that knowledge on their teaching. All participants were asked about their subject matter knowledge in both biology and physics and to subsequently plan an instructional unit in both areas. Results indicate that when teaching in their own fields, teachers were more likely to detect student preconceptions, could identify which ideas were likely to be difficult for students and were more likely to adequately deal with those concepts and preconceptions during instruction with a variety of analogies, examples, demonstrations and models. Outside their fields, they often showed a less organized understanding of the information and held misconceptions that they integrated into their plans for teaching the content. The teachers in both fields used a similar number of examples and analogies when planning instruction, but the examples and analogies were more accurate and relevant in their fields of teaching expertise. It is apparent that teaching in a higher subject matter knowledge condition positively affected the number and quality of the representations that teachers used.

Physical education researchers supported this view with similar findings in their study. Recently, Schempp, Manross, Tan and Fincher (1998) studied the influence of subject matter expertise on teachers' teaching in physical education. They found that there were significant differences between teachers teaching subjects in which they had expertise, and teachers teaching subjects in which they had little or no expertise. Subject experts were more comfortable and enthusiastic about pedagogical duties and could accommodate a great range of abilities. It supports and agrees with those who believe deepening teachers'

subject matter expertise is a way to improve teaching (Ball & McDiarmid, 1990; Marks, 1990).

However, studies also indicate that subject matter expertise alone does not make a person a good teacher of that subject. Veenman (1984) reviewed 83 studies and concluded that programmes which emphasize subject matter training at the expense of professional education courses are less effective in preparing novices to teach. Other researchers comparing the teaching effectiveness of liberal arts graduates with that of graduates in education indicate that education majors perform better than non-education graduates on classroom management skills, lesson presentation, communication skills, pedagogical content knowledge and ability to relate content to the students' needs and interests (Denton & Lacina, 1984; Grossman, 1990).

Grossman (1989) found that first-year teachers with a master's degree with no formal teacher education were much less prepared to deal with student needs than first-year teachers who had completed a teacher education programme with a strong subject component. The formal group realized that they should consider students' needs and prior knowledge but had difficulty making decisions about the best instructional steps to take. They were unsure how to effectively adjust to student diversity and unprepared for students' preconceptions.

Physical education researchers also provide evidence that possessing subject matter alone is insufficient for effective teaching. Stroot and Oslin (1993) conducted an experimental study examining pre-service teachers' ability to use component-specific feedback to positively influence elementary students' performance on the overhand throw. By analyzing videotapes, they observed that teachers possessed content knowledge but had a limited ability to apply

knowledge by providing appropriate feedback. This indicates that teachers need to have pedagogical knowledge in order to transmit their content knowledge into the teaching process effectively.

Most studies on the subject fail to support the hypothesis that increasing teaching subject area preparation requirements improves students' teaching performance. Evertson, Hawley and Zlotnik (1985) concluded from their study review that there is little empirical evidence to support the belief that increasing teachers' knowledge of their subject beyond that typically required for professional training significantly increases teacher effectiveness. From the findings of a large scale study of teacher education programmes with more than 700 teachers and teacher candidates at the National Centre for Research on Teacher Learning in America, Kennedy (1991) reported that majoring in an academic subject provided no assurance that teachers were prepared to be effective classroom instructors.

In all, research evidence indicates that subject matter knowledge is an important prerequisite for effective teaching, however, it is not sufficient in and of itself and that knowledge beyond that typically required for professional certification does not result in increasing the quality of teaching performance. Perhaps other teacher knowledge, such as pedagogical knowledge and pedagogical content knowledge, may also play a part in an effective teaching process.

Pedagogical knowledge and teaching

General pedagogical knowledge includes a wide range of abilities within the classroom teaching process. According to Shulman and Sykes (1986), it covers:

Lesson and unit planning, classroom organization and management, teaching techniques, student testing and grading...setting up a classroom for instruction. Organizing groups, establishing routines...knowing how to ask questions at an appropriate level, establishing a proper pace of the questions and answers, monitoring the work of small groups or individuals at seat work, praising effectively and criticizing sensitivity...forestalling discipline problems before they occur...and skillfully managing misbehavior in the classroom. (Shulman & Sykes, 1986, pp. 9, 10)

These include a range of general teaching procedures in the classroom.

Ebert (1993) described pedagogical knowledge as classroom schemata which include different means of instruction, such as lecture, cooperative- group and guided discovery, and different means of assessment. It is obvious that this professional knowledge is closely associated with instructional practices.

A study of pedagogical knowledge was conducted by Powell (1991), who examined the growth and development of the pedagogical schemata of sixteen Midwestern pre-service teachers in a graduate level, secondary alternative certification programme. Results indicated that the participants passed through four stages of development throughout the programme: atheoretical, theoretical, integrated, and practical schemata. He emphasized the importance of having teacher preparation with initial pedagogical knowledge before entering the classroom.

However, physical educators also demonstrated that possessing pedagogical knowledge might not be sufficient for good teaching. Leblond and Soucie (1987) surveyed 82 physical educators who were tennis enthusiasts. They found that the physical educators felt they had the technical and pedagogical knowledge

required to teach, but they were prevented from teaching tennis in the high schools because of limited teaching stations combined with large numbers of students in their required classes. This implies that they need other specific kinds of teacher knowledge which relates their subject matter knowledge to their pedagogical knowledge in order to teach effectively. This specific kind of knowledge is termed pedagogical content knowledge.

Pedagogical content knowledge and teaching

Pedagogical content knowledge originated from other types of knowledge, for example, content or subject matter knowledge and general pedagogical knowledge. It only received much attention after Shulman's (1986, 1987) seminal work. Shulman suggested that pedagogical content knowledge helps to differentiate expert teachers in a subject area from subject area experts as well as teaching experts from the inexperienced.

According to Shulman (1986), effective teachers need to transform their subject matter for teaching. This process only occurs as the teacher critically reflects on and interprets the subject matter and lastly finds multiple ways to represent the information as analogies, metaphors, examples, problems, demonstrations and classroom activities. The teachers adapt the material to students' abilities, gender, prior knowledge, and preconceptions and tailor the materials to those specific students to whom the information will be taught. Thus, pedagogical content knowledge is a teacher's integrated understanding of four components of pedagogy, subject matter content, student characteristics, and the environmental context of learning (Cochran, DeRuiter & King, 1993). Buchmann (1984) pointed out that good teachers must maintain this fluid control

or flexible understanding of their subject knowledge. Gudmundsdottir (1987a, b) described this transformation process as a continual restructuring of subject matter knowledge for the purpose of teaching. This means that pedagogical content knowledge is tied directly to subject matter knowledge and develops over time as a result of multiple experiences in innumerable classroom settings with many students. It is also associated with the teachers' knowing about the learning of their students and the environmental context in which learning and teaching occur. Cochran and her associates (1993) suggested that the development of pedagogical content knowledge requires early, continued and authentic field experiences with opportunities for real teaching and follow up reflection and feedback.

Research findings have indicated that pedagogical content knowledge is closely related to effective instructional practice in both general education and physical education. Educational researchers have provided ample evidence that inexperienced teachers have incomplete and superficial levels of pedagogical content knowledge (Carpenter, Fennema, Peterson & Carey, 1988; Feiman-Nemser & Parker, 1990; Gudmundsdottir & Shulman, 1987; Reynolds, 1992). Carpenter and his associates (1988) found that a novice teacher often relies on unmodified subject matter knowledge, most often directly extracted from text or curriculum materials and may not have a coherent framework from which to present information. The novice also tends to make broad pedagogical decisions without assessing students' prior knowledge, ability levels, or learning strategies. In an extensive review of studies on the competence of beginning teachers, Reynolds (1992) also pointed out that much of their teaching competence related to the development of pedagogical content knowledge.

Even (1993) designed a study to examine teachers' subject matter knowledge and its interrelations with pedagogical content knowledge related to the concept of function in mathematics secondary education. Results indicated that many of the subjects did not have a modern conception of function. This limited conception of function affected the subjects' pedagogical thinking. Based on the findings, Even (1993) concluded that "good subject-matter preparation for teachers is necessary but not sufficient" (p. 113). Teachers need to develop a powerful repertoire of teaching skills as well. "Therefore, a good content-specific pedagogical preparation is also needed" (p. 114).

In physical education, teacher educators also agreed and recognized the value and educational importance of pedagogical content knowledge to teaching. Siedentop (1989) maintained that "pedagogical content knowledge is the 'main stuff' from which effectiveness and expertise in teaching and coaching derives" (p. 2). Rink (1990) also commented that pedagogical content knowledge would play a major role in professional preparation in future, "...teacher preparation programmes must begin to focus on ways to give students both content knowledge, as well as pedagogical content knowledge" (p. 4).

Recently, Rovegno has spent considerable efforts in conducting research on pedagogical content knowledge in physical education. Rovegno (1992a) drew on McEwan and Bull's (1991) and Marks' (1990) beliefs about pedagogical content knowledge to define the subject. She concluded that "Mark's conception of pedagogical content knowledge captures how a teacher's knowledge integrates content, the context of schools, how children learn and classroom teaching" (p. 70).

Based on the findings of the study, Rovegno (1992b) suggested that pedagogical content knowledge “functioned like a tool that was used in perception and action and developed with use” (p. 78). She indicated that the participants in the study linked inadequate pedagogical content knowledge to problems observing student performance and teaching, and connected knowledge development to improve observation skills and teaching. Although the participants were able to make careful plans for observing and for teaching content, they have difficulties in observing student performance.

Rovegno (1992c) conducted another study to examine how pre-service physical education teachers acquire content knowledge about a non-traditional movement approach when teaching elementary physical education. In this study Rovegno defined “content knowledge” as “what Shulman (1986) called curricular knowledge and pedagogical content knowledge” (p. 254). Rovegno found that participants used knowledge acquisition mechanisms to oversimplify content and attended to aspects of the movement approach that were relevant to novices’ capabilities. She concluded that “content knowledge acquisition is a complex process that occurs over considerable time” (p. 262).

Findings of the above studies also suggested that the learning of pedagogical content knowledge can be incorporated into senior courses for physical education pre-service teachers during their training. Rovegno (1992c) found that the participants using a movement approach to teaching had difficulty in understanding the content areas of games, dance and gymnastics and their relation to movement goals and variations. However, the subjects in a field-based methods course in physical education increased their knowledge and understanding of the roles of task, individual and environmental aspects related to

their development of pedagogical content knowledge in which they were involved.

It is likely that pedagogical content knowledge can be learnt.

In a follow up study, Rovegno (1993b) further investigated what and how K-8 physical education teacher education majors learned about the movement approach to game play/strategy that was different from their traditional K-12 experiences. Results of the study revealed that although the physical education teacher education majors understood and accurately applied many aspects of the movement approach, they reported problems in their pedagogical content knowledge of game play/strategy.

Rovegno (1994) attempted to delineate the nature of pedagogical content knowledge through a qualitative study. Two students were observed teaching games and a high school sport unit. Findings indicated that both student teachers in the elementary school tried to use informing, extending and refining tasks and consistently provided group and individual feedback to children. However, as soon as they started to interpret particular aspects of the high school culture, they quickly retreated to a “curricular zone of safety” (p. 272) which meant shifting to mostly application tasks with pupils playing games. Results of this study imply that the situated nature of pedagogical content knowledge, the influence of school culture and student teachers’ construction of meaning are important in pedagogical content knowledge.

Although not looking into the specific concept of pedagogical content knowledge, Rovegno (1998) studied the development of in-service teachers’ knowledge of a constructive approach to physical education. Rovegno noted that the participants developed their pedagogical content knowledge by carefully watching children’s responses as well as by modeling and guidance from

experienced teachers. Findings of this study demonstrated that teachers' pedagogical content knowledge development was facilitated by experience and more experienced teachers.

All in all, Rovegno has acknowledged the importance of pedagogical content knowledge. She also describes pedagogical content knowledge as inseparable from content knowledge, both co-exist relationally and situationally. It is only through experience that student teachers and novice teachers learn to refine, develop and differentiate these types of knowledge. It seems that Rovegno also agrees that experience is closely related to the development of pedagogical content knowledge.

Besides Rovegno, other physical educators also conducted research on pedagogical content knowledge in physical education. Chen and Rovegno (1995) studied the acquisition of pedagogical content knowledge by two pre-service teachers in learning a movement approach in physical education, specifically in educational gymnastics and dance. They also identified that there were two major problems in the development of pedagogical content knowledge of the movement approach: 1) the pre-service teachers lacked an understanding of the difference between educational dance and gymnastics, and 2) they did not incorporate the use of guided and discovery teaching strategies. This indicates a weakness in both the content and pedagogical knowledge areas separately, as well as the integration of these knowledge areas into pedagogical content knowledge for the movement approach to educational gymnastics and dance.

Chen and Ennis (1995) examined the transformation of pedagogical content knowledge in the process of making curricular decisions in secondary physical education volleyball units taught by three master teachers. The results of the

study indicated that, although the teachers had similar content knowledge of volleyball, the pedagogical content knowledge displayed by each teacher differed according to the perception the teacher had regarding the “teachability” (p. 399) of the subject for their particular class. The interpretation by the teacher of the students’ abilities led them to include or exclude curricula in their volleyball units. The findings indicate the importance of the inclusion of pedagogical content knowledge in the teacher education programme, in order to identify teacher bias within curricular decision making.

Recently, Tsangaridou (2002) designed a study to describe the enacted pedagogical content knowledge of an elementary classroom teacher during student teaching. Findings indicated that the participant designed instructional tasks with an emphasis on students’ learning. She was able to transform content knowledge and deliver it to pupils in ways that helped them learn. She used examples, demonstrations and open-ended questions to enhance students’ learning and understanding. She also designed partner and group task activities to help students work cooperatively. These suggested that the pre-service teachers’ pedagogical content knowledge affected her actions and practice.

From the studies reviewed above, it seems that teaching experience may affect the acquisition of pedagogical content knowledge. In practice, it may exert both positive and negative impact. The choice of schools for application and of mentors is particularly important for a positive experience for pre-service teachers (Rovegno, 1992b, 1993a, 1994; Siedentop & Locke, 1997). A study of two pre-service teachers teaching basketball and volleyball units highlighted the effects of the school context (Rovegno, 1994). Certain school situations obliged the student teachers to confine their content to a “curricular zone of safety” that

allowed them to survive professionally but limited their professional development.

All studies have underscored the importance and complexity of pedagogical content knowledge. Researchers demonstrated that there were difficulties in acquiring pedagogical content knowledge during initial training. The difficulties thought to be connected with the nature and structure of the pedagogical content knowledge were: a) more procedural and experiential, b) specific to the content taught, c) embedded in the actual teaching, d) linked to integrated knowledge, beliefs, and experience, and e) dependent on contextual and institutional constraints.

On the whole, pedagogical content knowledge in physical education is situated knowledge specific to the skills taught. It is developed through the integration of theory and practice in initial teacher education as well as during professional experiences in later stages. The context variables and subject variables are decisive elements in the evolution of this knowledge. It has gradually become a generic term to signify teachers' professional knowledge in the field of both general education and physical education.

2.7.5 Summary

Although teacher knowledge is recognized as closely related to effective teaching, it has not been well conceptualized and consistently used across studies. There were different forms and various types of knowledge being mentioned in education studies. Different researchers proposed different models to explain what knowledge teachers need in order to teach effectively, pedagogical knowledge and subject matter knowledge were listed as essential parts of teachers' core knowledge. Shulman (1986, 1987, 1988) suggested that

pedagogical content knowledge should be used to evaluate teaching expertise in addition to pedagogical knowledge and subject matter knowledge. Study findings indicated that teachers might develop these types of knowledge through various sources, such as school experiences as students, pre-service training, in-service training, teaching experiences and even throughout the whole professional life career. Studies showed that either pedagogical knowledge and subject matter knowledge alone may not be sufficient to carry out effective teaching process. How well and what ways teachers use to convey the subject matter to students may be critical to good and effective teaching. Therefore, the development of pedagogical content knowledge appears to be essential to effective teaching. Since studies have shown teachers gained this knowledge through experience, this concept is especially important to the present study. The present study is an attempt to examine teaching behaviours differences between pre-service and in-service student teachers. As the in-service student teachers have more teaching experience, they may incorporate more pedagogical content knowledge within their teaching behaviours than their pre-service counter-parts.

2.8 Overview of the Chapter

Good teaching is a matter of mastering the skills and knowledge of teaching. Teachers develop their teaching skills and knowledge progressively. After reviewing the Fuller Developmental Theory of Teacher Concerns, educators generally agree that the concern theory of teacher development is a dynamic ebb and flow process. Different concerns may be held simultaneously by teachers. Most educators accept Berliner's (1988a) five-stage theory of skill learning and

teacher development model and agree that teachers learning to teach progresses from an internal self-oriented nature toward a more external student-oriented nature. However, they caution that individual and environmental factors that influence professional growth must be considered. This information is important to the investigator of the present study when examining the teaching behaviours of pre-service and in-service student teachers. The pre-service and in-service student teachers may be at different stages of their development.

The classroom practices of teachers appear to be influenced by their beliefs and values. As beliefs are evolved from personal experience, teachers' beliefs will be continuously reconstructed along with their professional growth and development. Literature reviewed indicated that teachers' beliefs seem to affect their teaching behaviours to a certain extent, while other factors such as psychological, social and environmental realities of the teachers' schools, may also be involved in their teaching process. For the present study, the pre-service and in-service student teachers may possess different beliefs and exert different influences on their teaching. This helps to remind the investigator to look into the student teachers' teaching beliefs and their perception of ball games teaching in the present investigation.

Dialectical approach on teacher socialization shows that teachers can play active role in the establishment of their beliefs, attitudes, and behaviours in relation to the workplace requirements and constraints. Review of literature on teacher socialization indicated that teachers were continuously influenced by different socializing agents within their learning and teaching environment. This information is essential to the investigator when studying the teaching behaviours of student teachers in the present study as the teaching behaviours are the outcome

influential products of several socializing factors. Since the two groups of student teachers might receive different impact from different socializing agents in different stages of socialization, this prompts the investigator aware and look into the effects of the socializing agents on the student teachers in the present study.

The student teachers mainly learn their teaching skills and teaching knowledge during their teaching training education. Different groups of participants in the teacher education programme might have influenced their learning to teach process and professional development. After reviewing the influence of the participants of the teacher education programme on the development of student teachers, we learnt that different parties have played important roles in the student teaching experience process. This is an important reference for the investigator when he examines the teaching behaviours of the student teachers because these parties all might exert certain effects on the student teachers.

As the major focus of the present investigation is the classroom teaching behaviours of student teachers, we must first need to clarify and understand the concept of effective teaching behaviours. Since teaching is contextual in nature and takes place in a complex environment, effective teaching is not “one size fits all” and is closely related to the teacher’s experience, knowledge and context. Nevertheless, research evidence indicates teachers’ instructional techniques, feedback and management skills associate with effective teaching in both classroom and gymnasium settings. Besides, physical education researchers also demonstrate that the time variable is an important factor in teaching physical education. How physical education teachers spend time in their lessons will

influence their students' learning. Based on these findings, the present investigation will concentrate on looking into the instructional and management behaviours of the student teachers as well as the time spent in each type of teaching behaviours in ball games lessons.

In order to know more about effective teaching, the teaching behaviours of teaching experts were identified. After reviewing the studies, educators suggest that the differences in the teachers' experience and their structure knowledge may contribute to the differences in their classroom behaviours. Therefore, studies related to teaching experience and instructional practice as well as the literature concerning the comparison of experienced and novice teachers were reviewed. Results of most studies indicated that there were differences in overall teaching performance between the most and least experienced teachers. It seems that experience could change a teacher's teaching performance. This supports the basic assumption of the present investigation. The in-service student teachers may teach differently from their pre-service counterparts as they have more in-field teaching experience.

As teachers' knowledge is closely related to effective teaching, studies of teachers' knowledge were also reviewed. Findings of the studies reviewed indicated that teachers develop their professional knowledge through various sources within their career life. Researchers suggested that pedagogical knowledge, subject matter knowledge and pedagogical content knowledge are essential components of effective teaching. Therefore, the different knowledge bases of the in-service and pre-service student teachers may also produce different teaching behaviours. For this reason, the investigator also looks into the professional knowledge of the in-service and pre-service student teachers.

Studies have indicated that teachers gained pedagogical content knowledge through teaching experiences, consequently the investigator suspects that the in-service student teachers may possess a higher level of pedagogical content knowledge than their pre-service counterparts. Different knowledge bases of the two different groups of student teachers might be a plausible explanation for the differences in their teaching behaviours. These all serve as background information for the interpretation of the results of the present study.

Chapter 3

METHODOLOGY

This study examined the teaching behaviours of both pre-service and in-service primary physical education student teachers in ball games lessons. Specifically, the objectives of the study were to: (a) describe the teaching behaviours of pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice; (b) determine whether there were differences or similarities in their teaching behaviours; (c) find out whether there were any differences between the teachers' perception, thinking and knowledge of teaching ball games activities; (d) seek explanations for the differences or similarities in their teaching behaviours and to reveal the extent to which the factors of teachers' perception, thinking and knowledge of teaching ball games activities contribute to these differences and similarities.

3.1 Research Questions

In order to achieve the above objectives, several research questions and sub-research questions were set to guide the inquiry of this study:

1. What were the teaching behaviour patterns of the pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice?
 - 1.1 How did the primary physical education student teachers spend the time in different teaching behaviours in ball games lessons during their teaching practice?
 - 1.2 How did the pre-service primary physical education student teachers spend the time in different teaching behaviours during

ball games lessons?

1.3 How did the in-service primary physical education student teachers spend the time in different teaching behaviours during ball games lessons?

2 What were the differences and similarities between the teaching behaviours of the two groups of student teachers?

2.1 Did the two groups of student teachers exhibit similar or different teaching behaviours?

2.2 Did the two groups of student teachers use similar or different teaching strategies in ball games lessons?

2.3 Did the two groups of student teachers make similar or different decisions in teaching ball games activities?

3 Were there any differences in the student teachers' perception, thinking and knowledge of teaching ball games activities between the pre-service and in-service primary physical education student teachers during their teaching practice?

3.1 Did the two groups of student teachers have different beliefs and perceptions about physical education and teaching ball games lessons?

3.2 Did the two groups of student teachers possess different subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games lessons?

4 To what extent did the factors of student teachers' perception, thinking and knowledge of teaching ball games activities of student teachers influence their teaching in ball games lessons?

4.1 How did the student teachers' beliefs, perceptions and their thinking about physical education and teaching ball games lessons influence their teaching?

4.2 How did the student teachers' knowledge with respect to subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games lessons influence their teaching?

For the purposes of the study, the investigator employed the research design described below to address the above research questions. Both quantitative and qualitative approaches were used in the study. The quantitative approach mainly dealt with the data captured by the observation instrument in the first phase of data collection. Since teaching is a complex dynamic activity occurring in a complex environment (Shulman, 1987), quantitative data alone could not give a full account of the teaching behaviours of the student teachers. The qualitative methodologies in the second phase helped to provide further information on the teaching process as well as to supplement the "multiple realities" and patterns of teaching in the natural setting. The grounding of using these approaches is given in the following paragraphs. This chapter focuses on the rationale for the methodology used to investigate this topic and describes the details of various aspects of the procedures, including information about the subjects, settings, the role of the investigator, methods of data collection, data analysis and data trustworthiness.

3.2 The Rationale of the Methodology

The nature of what is being investigated and the underlying purposes of the

study determine the design of a research method. Educational researchers have agreed that the decision about which research methods to use should be determined by the appropriateness of the method to the issue under study and the research questions (Baum, 1995; McKinlay, 1993). The primary focus of this study is the teaching behaviours of pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice. Therefore, the data collection and analysis methods attempt to represent the nature of teaching behaviours. Both quantitative and qualitative research methodologies were adopted for this study.

The quantitative research methodology deals with a systematic observation instrument, the Physical Education Teacher Assessment Instrument (PETAI) (Phillips, Carlisle, Steffen & Stroot, 1986). The Physical Education Teacher Assessment Instrument (PETAI) was designed to measure alterable teacher and student behaviours that were believed to be related to student's learning in physical education. Since this instrument was specially developed for studying teachers' and students' behaviours in a physical education setting, it was considered more appropriate than other observation instruments for this study. Indeed, this observational instrument has provided significant data relative to the interactions between teachers and students during the learning process.

The qualitative research methodologies deal with several data collection techniques: two formal interviews, two stimulated recall interviews and the taking of field notes during lessons observation. Data generated from these methods may supplement and give a better picture as well as an understanding of the teaching process of the participants. Geertz (1993) indicates that qualitative data should give "thick" contextual description of groups as they make sense of their

social worlds. Merriam (1998) further states that the interpretive (qualitative) approach or perspective is particularly appropriate when answering questions that focus on process rather than outcome or product. This approach relates to the meanings that individuals give to objects or events, and the uniqueness of contexts within which these events take place. The present study focused on a specific context, namely the teaching behaviours of participants in basketball, football and volleyball lessons during their teaching practice. As teaching is an interactive complex process, qualitative data may help to produce more understanding because of the attempt to reflect the “multiple realities” which exist within a given social setting (Bogdan & Biklen, 1992). Patton (1990) has contributed to this analysis by setting out some of the functional characteristics of the qualitative methodology. He describes this approach as holistic and naturalistic in nature. Holistic means this approach includes getting data on a variety of aspects of the questions under study, and synthesizing the data so that the complexity of the phenomena can be precisely and fully represented.

For the present study, the qualitative approach helps to provide information about the effects of participants’ perception, thinking and knowledge on teaching ball games activities, as all these underlying factors may influence the teaching of the student teachers. Naturalistic inquiry involves the researcher examining and keeping details of the complex interactions and patterns of human actions in the natural setting. It would seem that the specific natures of the qualitative techniques are deemed appropriate to explore the underlying purpose of this study.

Many researchers have pointed out that using both quantitative and qualitative approaches are complementary to each other and can provide valid and reliable data to answer research questions of the study (Husen, 1997; Patton, 1990;

Sherman, 1992). Patton (1990) suggests that one important way to strengthen a study is to utilize a combination of methodologies in the study of the same phenomena or programmes. He refers to this as triangulation. According to Denzin (1989), the logic of triangulation is based on the assumption that

No single method ever adequately solves the problem of rival causal factors...Because each method reveals different aspects of empirical reality, multiple methods of observations must be employed. This is termed triangulation. I now offer as a final methodological rule the principle that multiple methods should be used in every investigation.

(Denzin, 1989, p. 28)

Of interest in this study were pre-service and in-service primary physical education student teachers' teaching behaviours as identified by the PETAI. The study was also concerned with both groups' response to both the PETAI data and the subject's teaching context in order to develop some explanation for any differences. A qualitative methodology comparing two data groups was employed, with data being gathered from two formal pre-lesson interviews, two stimulated recall interviews, and field notes written by the investigator during the lessons' observation. An intended strength of this study is the triangulation of the data sources gathered from both quantitative and qualitative techniques. Further strength is sought from the thinking in the student teachers' interpretation and reactions to their teaching situations during the stimulated recall interviews. The formal pre-lesson interviews and the field notes collected during the participants' teaching provide further information to the PETAI data taken at that time. Hence, this study design has sought to provide a comprehensive view of the student teachers' teaching behaviours.

A limitation of this design is the small sample size. Another limitation is the uncontrollable intervening variables, such as participants' beliefs, teacher training education, work context, and responsibilities in school. This restricts the external validity and makes it more difficult to compare teaching behaviours between the pre-service and in-service student teachers. Nevertheless, despite all these limitations, results of the present study will provide some information on teaching behaviours of student teachers and help us to understand more about the teaching of the Hong Kong primary physical education teachers.

3.3 The Participants

Student teachers were the main interest in this study. Initially, pre-service and in-service physical education student teachers undertaking a primary education certificate programme at an institute of education in Hong Kong were approached as target participants for the study. They were the final year students of a three-year part time in-service course of training for teachers in primary schools and the final year students of a two-year full time certificate programme in primary education. The pre-service student teachers are comparatively younger than their in-service counterparts as they take up teacher education training right after their secondary education. The in-service student teachers are serving teachers with at least one year of teaching experience in primary schools but without teacher training. The graduates of these two programmes will become "Qualified Primary School Teachers" in Hong Kong. They will be qualified to teach one elective subject (physical education), Chinese, mathematics as well as general studies in primary school. Upon examination of the goals, the structure and the content, it can be argued that there are no major differences in

the two programmes (see Appendix 1). Thus, it is assumed that the in-service primary physical education student teachers receive the same teacher training as the pre-service primary physical education student teachers do. The major difference is that the in-service student teachers have more in-field teaching experience since they have to teach daily in their own schools, while the pre-service student teachers have limited field experience, having only six weeks teaching practice of general subjects in the first year and an eight-week practicum of elective subjects and general subjects during the final year. The outlines of these two teacher education programmes are listed in Appendix 1.

During their methods classes in physical education, as the subject lecturer, the investigator briefly introduced the outline of the proposed study. By using the assigned numbers of the students in the class list and the SPSS (Statistical Package for the Social Science) programme, twenty student teachers of both in-service and pre-service groups were randomly selected and invited to participate in the study. However, eight in-service and three pre-service student teachers showed no interest and declined the invitation. Three reserve pre-service student teachers according to the randomly selected order filled up the places while the remaining of the in-service group did not wish to participate in the study. Although there is an element of self-selection of the in-service group, the investigator had no control of the will of the student teachers to take part in the study. Subsequently, twenty pre-service and twelve in-service student teachers met again for further clarification and discussion about the conduct of the study.

Six from both groups were also randomly selected and consented to take part in the second phase of the study by allowing the investigator to observe their videotaped lessons, conduct in-depth interviews as well as engaging them in

stimulated recall sessions. A total of two females and one male from each group participated in the later stage of the study. The teaching experience of these three in-service student teachers ranged from three years to seven years.

To insure protection and to gain the trust of the participants, confidentiality and anonymity were guaranteed concerning the collection of data and the report of the study. Pseudonyms were also used throughout the study to protect the participants' identities. Erickson (1986) commented that these procedures help to lower risk (social, physical or psychological) for the subjects and address the ethical issues of paradigmatic research.

3.4 Settings

During the first phase of the study, both twenty pre-service and twelve in-service primary physical education student teachers were asked to videotape two ball game lessons of physical education during their teaching practice period. Since this was the first exposure to teaching physical education of the pre-service group in school, they were advised to record their lessons within the last three weeks of their teaching practice period. The in-service group was asked to videotape their lessons during the last semester of their teacher education programmes. This is to ensure that they both have attended the methodology and didactic courses as well as gaining full advantage of the student teaching experience in real school settings. The participants were assured that all data collected would be confidential and in no way affect their grade assessment for the student teaching performance. They were strongly requested to use their usual teaching methods during the videotaped lessons. Student teachers were reminded to explain to the class on the first day that the video camera was in class,

and the recorder is assisting in the research for the dissertation of a graduate student. The video camera was brought into the class one lesson before the start of data collection to help minimize the effect of reactivity with students. The participants were not told the purpose of the study until after the complete videotaping of their lessons.

The six participants taking part in the second phase of the study informed the investigator of the dates and times of the two videotaping lessons. The investigator arranged two pre-lesson interview appointments with these participants before the videotaping of the lessons. Subsequently the investigator also observed the lessons and made field notes, recording according to the time schedule provided by the six participants. Post-lesson interviews with stimulated recall sessions were conducted within one week after the videotaping of the lesson.

Sixty-four of the lessons videotaped were taught to pupils from primary three to primary six. For the interest of the investigator and the purpose of unifying the teaching contents, the activities taught in the lessons were limited to ball games activities. Although there was constraint due to the curriculum assigned during the teaching practice, all participants agreed to videotape two lessons of ball games activities. Activities taught by the in-service student teachers during videotaped lessons were basketball (11 lessons), football (7 lessons) and volleyball (6 lessons). The pre-service student teachers taught the same three types of games activities: basketball (14 lessons), football (14 lessons) and volleyball (12 lessons). It was hypothesized that this kind of arrangement would minimize possible variation of their teaching behaviours in different ball games lessons.

Equipment supplied for teaching activities appeared to be adequate. The sport facilities for physical education lessons in each school included one opened court, one covered playground and some leisure spaces. It was also hypothesized that the sport facilities and equipment in each school would not influence the teaching behaviours of the student teachers to any major degree.

3.5 Role of Investigator

Throughout the study, the investigator attempted to build up a trusting relationship with the participants. I believed that I was successful in achieving this goal. Most of the participants remained in contact with me even after they had graduated and obtained teaching positions in schools. The relationship process was also helped because I had taught them physical education modules within the teacher programmes for which they enrolled. During the initial meetings, I stressed that I had a non-assessor role and would not be involved in the evaluation procedures within their teaching practice.

Since the teaching practice performances of both the pre-service and in-service student teachers have to be assessed by the education institute supervisor, teaching practice is usually regarded as a stressful experience. As I have to fulfill the dual role of the institute supervisor and the study's investigator, there was a possibility this would potentially result in the participants being less open and honest in what they discussed during the interview meetings. By adopting a non-assessor position within the teaching practice I hoped this would help to establish the trust level with the participants. In practice, although I took a non-assessor role within the teaching practice, I offered general support to the participants when requested. In order to minimize the effects of these responses,

I always kept in mind to give verbal encouragement to both groups of participants.

I also played the role of non-participant observer in the classroom setting.

It would, however, be unwise to claim my presence did not influence the teaching practices of each participant. It is possible that some effects were influenced simply as a result of requesting the participants to think and talk about their performances during the stimulated recall interviews. On several occasions, I was asked to give feedback or advice concerning the participants' teaching performance after the interview. It was hoped that this would contribute to the close relationship and mutual trust between the investigator and the participants.

Indeed, when I entered the research process, I brought with me seven years of experience in teacher education and professional education knowledge as teacher as well as personal interest in teacher education programme and the process involved in student teaching of the student teachers. During the study, I did my best not to let these experiences and knowledge interfere with data collection and analysis.

I understand that the researcher is a central figure that will influence the collection, selection, and interpretation of data in qualitative research. Acting as teacher of the student teachers, my position may affect participants' responses, thereby influencing the direction of findings. Reflexivity is one of the tools I use to increase the integrity and trustworthiness of my study. Through the process of reflexive analysis, I continually evaluate the impact of my position and participants on each other and on the research. According to Finlay (2002), reflexivity is defined as "thoughtful, conscious self-awareness. Reflexivity analysis in research encompasses continual evaluation of subjective responses, intersubjective dynamics, and the research process itself" (p. 532).

As I conducted the research, I was aware of my own opinions, prejudices, and biases. I consciously considered those sets of beliefs as I approached the study with openness to new learning and perspectives different from my previous experiences and knowledge. I always remind myself not to comment on the participants' interview responses before the start of each interview. Beyond talking about the responses during the interview and the logistic of the study, personal conservation was limited and monitored closely. I hope these strategies will help to minimize the effects of my position as the teacher of student teachers in the study.

3.6 Methods of Data Collection

In an attempt to match the data collection methods to the research questions, several data collection techniques were used. The fundamental techniques for gathering information for this study were systematic observation, in-depth interview, and non-participant lesson observation as well as video and stimulated recall sessions. In practice, the data were collected in two phases. During the first phase, all the participants videotaped their own lessons at their own schools, while in the second phase, the lesson observations were done at the six participants' schools. The pre-lesson interviews and post-lesson interviews plus the stimulated recall sessions were conducted in the investigator's office at the convenience of the participants.

Systematic Observations

The purpose of the systematic observation and analysis was to provide a precise description of the instructional and managerial behaviours of the student

teachers in ball games teaching during their teaching practice.

In the first phase of the study, all participants were requested to videotape two ball games lessons by using a videotape camera placed in a location which did not interfere with their normal teaching of the lessons. Videotaping started when the teacher and the first pupil entered the playing area and continued until the pupils were dismissed.

For the purpose of this research, the videotape of each lesson was coded using the revised version of the Physical Education Teacher Assessment Instrument (PETA) (Phillips, Carlisle, Steffen, & Stroot, 1986). This instrument helps to capture how the teacher spends the allocated time in the use of different instructional and managerial teaching behaviours.

The PETA allows for a continuous temporal recording of two categories of teacher behaviours, the *instructional* and the *managerial*, which meets the initial purpose of the study. There are five teacher instructional behaviours categories and five teacher managerial behaviours categories within the PETA. The five teacher instructional behaviours categories are planned presentation (PP), response presentation (RP), monitoring (M), performance feedback (PF), and motivational feedback (MF). The five teacher managerial behaviours categories are beginning/ending class (BEC), equipment management (EM), organization (O), behaviour management (BM), and other tasks (OT). The definition of these behaviours categories together with examples are shown in Appendix 2.

The main measure of validity of the PETA involves content validity. The behaviours types of the PETA and their respective subparts have been explicitly defined and observed in all types of classroom setting including formal physical education lessons. Phillips and Carlisle (1983) state further that the categories of

the instrument have been identified in extensive teacher effectiveness literature. The clearness of the behaviour categories and the easily comprehensible examples given by this instrument have increased its content validity (Dunkin & Biddle, 1974). Siedentop and Olson (1978) have indicated that “the level of conjecture” in the observation system’s definitions of categories is important for establishing content validity. Phillips and Carlisle (1983) claim that most of the variable categories in the PETAI appear to meet the criteria of ‘low conjecture’ as stated by Siedentop and Olson (1978). The continuous recording of data of PETAI has given high representation of the data, which in turn provides additional support for the validity of the instrument.

In relation to the reliability of the instrument, Phillips and Carlisle (1983) reported that the test-retest and inter-observer reliability for teacher behaviours were established by four trained observers who viewed video tapes from 18 physical education classes. Test-retest correlations level ranged from .76 to .98 for the four observers. The inter-observer coefficients between the four observers were found to range from .77 to .95. This implied that there would be high levels of agreement between observers and that the category definitions were mutually exclusive with no overlapping and ambiguity.

To establish the reliability of the quantitative data, both intra- and inter-observer agreement measures were made by using the methods suggested by Van der Mars (1989b). Two research assistants were trained and supervised by the investigator to get familiar with the observation system (PETAI) and the coding procedures for the instrument. They were briefed with the definition of the categories and instructions on how the system worked. The observers then practiced by watching and coding a videotaped lesson. The investigator and the

observers met again to discuss the problems and questions arising from coding the tape. Both observers surpassed the accepted limit of 80% recommended by Van der Mars (1989b) in the intra- and inter-observer agreements before they started coding the videotaped lessons.

The amount of time spent in each teacher behaviour category was recorded in minutes and seconds. This information also allowed for converting use of categories into the percentage of lesson time spent in each behaviour category at a later stage.

There were several reasons why this instrument was chosen. Firstly, this instrument was specially developed for providing professional description of the behaviour of a teacher in the physical education setting. Secondly, the amount of time teachers utilized for instruction and for management were the two major teacher behaviours categories recorded by the instrument which fulfilled the major purpose of the present study. Thirdly, this instrument was developed as a research tool to allow precise description of videotaped teaching behaviours and also match the application to the present study. Additionally the clear descriptions of the behavioural categories and examples given by the instrument helped the investigator and the research assistants become proficient in coding teacher behaviours. A further reason for choosing the PETAI was that the instrument had been used by physical education researchers in both British and American studies (Aicinena, Steffen, & Curtner-Smith, 1992; Curtner-Smith, Kerr, & Hencken, 1995a, 1995b; Lacon & Curtner-Smith, 1998; Laker, 1994; Smith, Kerr, & Wang, 1993). This allowed cross cultural comparisons of the results generated.

However, there are limitations of the PETAI instrument when it attempts to describe the teaching behaviours of a physical education teacher. As teaching physical education is an interactive and dynamic activity, the recording of these events into pre-determined categories may not reflect the real situation of the lesson. In gathering static information from a highly interacting and fluent situation, quantitative information alone may not give the full picture of the teacher's teaching behaviours. It is important to acknowledge this and bear it in mind when interpreting the results. Therefore, qualitative data of the teachers' teaching behaviours are needed in this study.

In practice, a pilot study of the systematic observation was done prior to the start of the data collection. Eight pre-service and eight in-service primary physical education student teachers were invited to be subjects for the pilot study to assess the coding instrument and procedures. They were asked to videotape one physical education lesson. The teaching activities included athletic and games lessons. These lessons were viewed and coded by a research assistant. Observer training to use the PETAI was supervised by the investigator and involved the coding of the videotaped physical education lessons. The main purpose was to develop and refine the coding procedures of the research assistant. In order to establish the accuracy and consistency of the systematic observation procedures, both intra- and inter-observer reliability was checked by using the methods recommended by Van der Mars (1989b). Checking for intra-observer reliability involved the research assistant coding and recoding a pilot videotape of a physical education lesson prior to the study's commencement. This videotape lesson was again recoded two weeks into the study. During each intra-observer reliability check, the new coding of the lesson was compared with the first coding.

Intra-observer agreement was calculated for each teacher behaviour category by dividing the number of agreements by the number of agreements plus the number of disagreement and multiplying the result by 100. The unit of measurement used in these calculations was the second. Reliability percentages resulting from the checks ranged from 94.1% to 100% and, surpassed the acceptable limit of 80% suggested by Van der Mars (1989b).

Checking for inter-observer reliability involved another research assistant and the first research assistant, who had also been trained to use the PETAI, simultaneously coding a single videotaped lesson designated as the “reliability lesson”. Inter-observer agreement for each teacher behaviour category was calculated the same as the intra-observer agreement’s formula. This process continued until an agreement level of at least 80% was achieved on all behaviours. Reliability percentages resulting from this check ranged from 83.4% to 100%. The use of the inter-observer agreement checks sought to safeguard and minimize the effects of the “Observer Drift” and “Expectancy Effects” (Robson, 1993).

As a result of the pilot study, several changes were made in the videotaping and coding procedures. Firstly, the participants were advised to select a spot in the playground and place the camera in a position that could record their teaching behaviours safely throughout the lesson. On a few occasions, the teacher was not in view of the videotape recording but these were comparatively rare and of short duration. Secondly, participants were reminded to record their verbal interaction on audiotape with the students since the qualities of the sound on some video recordings were not good. Thirdly, to ensure the accuracy of the coding behaviours, a digital timer was used in future coding procedures. Lastly, the research assistant was asked to seek help from the investigator for clarification if

she found ambiguities when coding. Specific instructions concerning the filming of the teaching behaviours of the participants were given to the subjects (See Appendix 3).

Pre-lesson Interviews

In the second phase of the study, all six participants were interviewed using the same format and questions. The pre-lesson interviews were conducted after the participants completed their planning of the lessons, but prior to the start of the lessons. One of the purposes of the interviews was to understand the participants' beliefs and knowledge about the content they would teach. Besides, this also helped the investigator learn more about the participants regarding the following themes: a) personal background information related to sports experience, b) their conceptions about teaching physical education, c) perception of the teacher's role, d) their preparation in teaching ball games lesson, e) their workplace, and f) their understanding about their students. Participants were given the outline of the interview questions just before the interview. The investigator hoped that this might enable them to prepare and attend the interview in a more comfortable situation.

The interview was semi-structured and open ended. The interview guides can be found in Appendix 4. The interview questions were developed according to the research questions and the purpose of the study. The internal validity of the interviews was established by having the interview questions examined and commented upon by an experienced colleague in the field of the interview process (Merriam, 1998, p. 204). Patton (1990) indicates, "the purpose of interviewing is to find out what is in and on someone else's mind...to make it possible for the

person being interviewed to bring the interviewer into his or her world” (p. 279). Therefore the interview questions were relatively open-ended and helped to open up some general topics. Besides, the participants were continually reminded of the role of the investigator and encouraged to discuss issues related to their teaching from their perspective. Patton (1990) emphasizes, “the fundamental principle of qualitative interviewing is to provide a framework within which the respondents can express their own understandings in their own terms” (p. 290). The investigator also deliberately employed a conversational style during the interview meeting as a strategy to put the participants at ease so that they might express their views openly. This strategy aimed at minimizing the chance of the interviewees offering responses they think the investigator wants to hear.

Before the actual start of the interviews with the participants, the interview protocol was pilot tested with two full-time primary physical education student teachers from the Institute of Education who were not the research subjects. The purpose was to test the design of the interview questions and enhance the investigator’s interview techniques and the consistency in data collection. All pre-lesson interviews were audio-tape recorded to provide verbatim transcriptions for analysis. These transcriptions were also translated into English and reviewed by two English teaching instructors working in the Institution of Education. After the reviewing, no major revisions were made. All pre-lesson interviews lasted between forty five to seventy five minutes. A sample of pre-lesson interview is shown in Appendix 5.

Post-lesson Interviews with Stimulated Recall

Two interviews were conducted after the videotaping of two ball games

lessons. The post-lesson interview included common questions for all six participants. These interview questions were also pilot tested with the same two full-time primary physical education student teachers aforementioned. Based on the results of the pilot test, several questions were revised or eliminated. Interviewing skills in terms of questioning, procedure and timing were improved after the pilot test. The participants were given a copy of the interview guides and briefed again on the general procedure before the start of each post-lesson interview. The post-lesson interview questions outline can be found in Appendix 6. These questions were also semi-structured and open ended and sought to elicit information from the participants about their a) teaching performance in the lesson, b) perception of the students' responses, and c) comments on their teaching practice experiences.

Within the post-lesson interview, the participants were also briefed about the general procedure of the stimulated recall session. They were then asked to view eleven 2-min video lesson segments of their teaching and asked to respond to a series of semi-structured interview questions to stimulate recall of decisions made during teaching. The purpose of employing the stimulated recall technique was to elicit information about their explanations of and reasons for pedagogical decisions made during teaching. The procedure of the stimulated recall session was modified from the study of Byra and Sherman (Byra & Sherman, 1993) investigating the decision making of pre-service physical education teachers when teaching lacrosse. The participant viewed video segments beginning at the 2nd, 5th, 8th, 11th, 14th, 17th, 20th, 23rd, 26th, 29th, and 32nd minutes of each lesson. After viewing the first 15 seconds of each 2-min segment, the investigator would ask two questions to help the participants to determine information about the

recollection of their actions and thoughts: 1) How well do you remember this part of the lesson? and 2) How well do you remember what you were thinking during this part of the lesson? Byra and Sherman (1993) reported the stability reliability of these questions with a sample of twelve students between the question administrations for action recall was $r = .83$ and for thought recall $r = .79$.

After viewing each complete 2-minute segment, the participants were requested to respond to a set of semi-structured questions (see Appendix 7). The major aim of these questions was to ask the participant to account for and describe how s/he taught within this teaching episode. Probing statements “Oh yes! Can you elaborate more on this?” were occasionally used to seek more information when needed. The stimulated recall interviews lasted between 45 and 60 minutes. The participants commented on their teaching behaviours, thoughts and decisions made while teaching and these were audio-taped and transcribed for further analysis. Each interview was in fact transcribed by a research assistant. The investigator then read each transcription while simultaneously listening to the audio-tape of the interview to ensure accuracy of the transcription. These transcriptions were also translated into English and reviewed by two English teaching instructors. Only minor revisions were made. A sample of stimulated recall interview is shown in Appendix 8.

Stimulated Recall Technique

The stimulated recall method was originally used by Bloom (1953) to study teachers' thoughts, judgements, and decisions during interactive teaching. Later, this technique has been extensively employed to gather data of cognitive processes of teachers in various aspects of both the field of education and physical

education (Allison, 1987, 1990; Byra & Sherman, 1993; Ennis, 1994a; Fernandez-Balboa, 1991; Fogarty, Wang & Creek, 1982; Housner & Griffey, 1985; Peterson & Clark, 1978; Tjeerdsma, 1997; Walkwitz & Lee, 1992).

According to Shavelson, Webb and Burstein (1986), “stimulated recall is a technique for gathering retrospective reports of verbal and nonverbal thought processes under conditions of explicit and informationally rich recall cues regarding a well-circumscribed event”(p. 83). This technique assumes that participants can remember and verbalize their thoughts and actions completely and precisely. For the present study, videotaped lessons served as the relevant cues for recall. The method consists of replaying a videotape of a teaching event to help an individual to recall his or her thoughts and decisions made during the teaching event. Limitations of this procedure are that a participant’s responses could be simply a reaction to what is seen on the videotape, rather than the real experience during the lessons (Lee, Landin & Carter, 1992). Besides, this technique is also restricted in that the information about cognitive processes has been stored in long term memory, and this information may be incomplete because only selected elements may be retrieved and other elements may be forgotten over time (Shavelson, Webb & Burstein, 1986). Therefore, these stimulated recall interviews were completed within 7 days of the end of the each lesson.

Non-participant Observation and Field Notes

Two lessons of each of the six participants were observed and field notes were taken down to give a better understanding of their teaching practices. Marshall and Rossman (1995) described the observation as “the systematic noting

and recording of events, behaviours and artifacts (objects) in the social setting chosen for study” (p. 79). In fact, the teaching behaviours observed during the lesson is always purposeful and indicative of the participants’ values and beliefs. Besides, these observations were regarded as one of the major sources of data for the study. These data provide the investigator with questions or issues which he could explore with the participants during the post lesson interview and stimulated recall sessions.

The investigator acted as a nonparticipant during the observation. It means that he only observed and did not involve himself in the activities of the setting (Bogdan & Biklen, 1992; Spradley, 1980). This allowed the investigator not to disrupt the class routine so that he was as unobtrusive as possible. This is particularly important if the investigator wants to capture the “whole” teaching process of the participants. During the observation of the participants, field notes related to the teaching and learning activities were taken in the form of a field journal. Bogdan and Biklen (1992) define field notes as the written account of what the researcher sees, hears, experiences, and thinks in the course of collecting and reflecting on data. After the lesson observation, the field notes were expanded, transcribed and commented on by the investigator. As recommended by Bogdan and Biklen (1992), the notes taken down should be descriptive and comprehensive with “observer comments”. The field notes of the present study included both objective observation, subjective comments and feelings about the participants’ teaching behaviours. It is important to note that the field notes of non-participant observation function as an additional data source for triangulation and provide supportive findings and validate findings for making conclusions. A sample of the field notes is shown in Appendix 9.

3.7 Data Analysis

Statistical Analysis of the Quantitative Data

Within the first phase of the study, systematic observation data generated by the PETAI coding procedure were entered into a SPSS (Statistical Package for the Social Science) version 10.0 programme (SPSS, 1999) for statistical analysis.

Descriptive statistics including the mean and standard deviation were calculated for all behaviours categories of the observation instrument. These descriptive data allowed comparison with the results of other studies in this area.

Independent t-tests for each behaviour category were employed to examine whether there were differences in the amount of time spent between the pre-service and in-service groups. A significance level of 0.05 (two tailed) was established for all test analyses.

Analysis of the Qualitative Data

Data collected were organized and analyzed depending on their sources.

Qualitative data for this study consisted of interview tapes, stimulated recall records and the field notes of lesson observation. The analysis of these data was based upon the methods of inductive analysis and constant comparison and coding procedures (Glaser & Strauss, 1967; Strauss & Corbin, 1990). Specifically, the analysis of teaching perspectives of both the pre-service and in-service student teachers included the following dimensions: conception in teaching physical education, ball games lesson preparation, decision making and thought process during lesson, teaching behaviours and teaching practice experiences. Initially, all interviews, stimulated recall sessions and field notes of lesson observation were fully transcribed. Through inspection and careful reading of the data,

interesting or surprising themes were identified within the data. This allowed categories to emerge from the data which were separated according to each theme. According to Strauss and Corbin (1990), this categorizing is regarded as “the process of grouping concepts that seem to pertain to the same phenomena” (p. 65).

For the analysis of the interactive decisions and the thinking of the student teachers’ reported interactive decisions, an interactive decision model, which was originally developed by Snow (1972) and Shavelson and Stern (1981) and later modified by Sherman (1983), was employed to categorize the student teachers’ interactive decisions. The model identifies five decision pathways that can be taken during interactive teaching. Paths 1 through 4 reflect decisions to continue the planned teaching routine unchanged. In path 1 the teacher judges that cues are within tolerable limits. Path 2 means that cues are perceived outside tolerable limits, but an immediate adjustment in teaching is unnecessary. In path 3 the teacher feels a change in the teaching is necessary, however, he or she is forced to continue the lesson unchanged because he or she does not know what else to do. A path 4 decision indicates that the teacher has an alternate plan but does not implement it. Finally, path 5 reflects the decision to deviate from the planned routine for the purposes of perceived lesson improvement. The audiotaped responses to four specific stimulated recall questions were employed to analyze the interactive pathways taken by the student teachers. Each of these four questions produced “yes” or “no” answers. The frequency of interactive decision pathways taken was summed and the responses to the other stimulated recall questions were used to investigate the thinking of the student teachers’ reported interactive decision.

Lastly, the investigator searched for the dominant trends and patterns within the study as a whole. The resulting data developed from the inductive process included the summaries of what was said and observed. Participants' direct quotations were used to provide validity to the data. Moreover, the original wordings of the participants in interviews were also provided and helped in understanding their meanings and intentions. Other events, incidents and evidence obtained during the lesson observations were used to supply answers for the research questions such as "Are there any differences and similarities in teaching behaviours between the pre-service and in-service student teachers?" and "What are the factors that contribute to these differences or similarities?"

3.8 Data Trustworthiness

Trustworthiness is the process the investigator uses to convince other audiences that the findings are worthy of attention and valid for the context (Lincoln & Guba, 1985; Patton, 1990). This study utilized five major strategies to establish the trustworthiness of results: triangulation, peer debriefing, member checks, negative case analysis and transferability.

Triangulation

Triangulation is a process by which the researcher can guard against the accusation that a study's findings are simply an artifact of a single method, a single source or a single investigator's biases (Patton, 1990, p. 470). Generally, the researcher would "cross-check" information and conclusions through the use of multiple procedures of sources. It is also a common strategy used by researchers for improving the validity of research or evaluation findings

(Mathison, 1988). Miles and Huberman (1984) state, "...triangulation is supposed to support a finding by showing that independent measures of it agree with it or, at least, don't contradict it" (p. 235). Patton (1990) adds that triangulation helps to strengthen a study design.

Denzin (1989) identified four types of triangulations: a) investigator triangulation – the use of several different researchers or evaluators in collecting and interpreting the data in the study, b) data triangulation – the use of multiple data sources to help understand a phenomenon in the study, c) theory triangulation – the use of multiple theories and perspectives to help explain and interpret the data and d) methodological triangulation – the use of multiple research methods to study a phenomenon. For the purpose of this study, data triangulation and methodological triangulation were used to enhance the accuracy and credibility of the research's findings. Triangulation of methods was used to overcome the biases of other methods. Findings from interviews, stimulated recall sessions, and lesson observations were compared and contrasted to cross-check data and interpretations. It was expected that inconsistencies and conflicts would emerge among data sources. These are important because it implies that different kinds of data have captured different aspects of the research questions. Consistent findings from different sources coupled with good explanations for differences in data from divergent sources should enhance the overall credibility of the study results.

Peer Debriefing

Peer debriefing is the "process of exposing oneself to a peer...for the purpose of exposing aspects of the inquiry that might otherwise remain implicit within the

inquirer's mind" (Lincoln & Guba, 1985, p. 308). The aim is to clarify and invite others to comment on the findings and interpretations of the researcher. The supervisor of the investigator for this study met regularly with the investigator for the purpose of peer debriefing. Discussion within the meeting mainly focused on the methodological issues and analytic interpretations. In addition, an experienced physical education and qualitative research colleague was invited to read and comment on the preliminary analyses, interpretation of the data and methodological procedures adopted as support for information.

Member Checks

Member checks is a process of providing the data and interpretations to the participants of the study and asking them to adjust and comment on the accuracy of the data or interpretations (Patton, 1990). The purpose of this process is to ensure the investigator is presenting "a more or less honest rendering of how informants actually view themselves and their experiences" (Taylor & Bogdan, 1984, p. 98). All the interview and stimulated recall record transcripts were returned to the participants and they were asked to correct errors or inaccuracies in the transcripts. They were also invited to comment, clarify, elaborate or suggest changes to their original responses. Only minor changes were made before the data analysis.

Negative Case Analysis

This is a process that involves continuously revising and refining a hypothesis until it accounts for all known cases without exception (Kidder, 1981). During the analysis data process, the investigator sought for negative cases. As

data were categorized and themes and patterns began to emerge, disconfirming data were purposely searched for. This deliberate search guaranteed that the investigator was not just looking for evidence to support his key assertions (Erickson, 1986). Various data sources of the interview transcripts, stimulated recall records and field notes of lesson observation were read closely for disconfirming evidences.

Transferability

Transferability of result findings is an important issue in qualitative case study research. Generalizability is usually not possible in qualitative case studies because of the differences that exist between settings. However, Firestone (1993) has pointed out that the generalizability issue can be addressed in qualitative case study research only through a case-to-case transference of results. He further asserts, “case-to-case transfer occurs whenever a person in one setting considers adopting a program or idea from another one” (Firestone, 1993, p. 17). In other words, it is the responsibility of the reader to transfer the results to his particular setting if the findings are applicable. As Stake (1978) indicates, “as readers recognize essential similarities to cases of interest to them, they establish the bases for naturalistic generalization” (p. 7). The readers may apply results to their own situations if they find similarities between the setting described and those they have experienced. Since the transfer of findings from case study research to another is done by the reader, the researcher has an obligation to provide a rich, detailed, thick description of the case to the readers (Firestone, 1993, p. 18). Thus, the written report in this study contained a detailed description regarding the context of the settings as well as the participants.

3.9 Basic Assumptions

When interpreting the results of the present study, several basic assumptions needed to be kept in mind. It is assumed that:

1. The PETAI is a valid instrument for the evaluation of teacher behaviours.
2. The videotaped episodes of the subjects' teaching in class and the behaviours recorded during the lessons observation are a usual representation of their teaching practice.
3. The subjects in the study have tried their best in planning, instructing, and managing their class lessons. Different lessons taught do not influence the subjects' teaching behaviours.
4. The students in the class are used to have extra observer in class due to the usual practice of school peer observation and student teachers' lessons observation practice.
5. The subjects in the study have tried their best in making use of their schools' equipment and facilities during their teaching lessons.
6. The subjects in the present study enrolled in both teacher education programmes have acquired the basic teaching knowledge and skills and help them to develop similar teaching competencies.
7. The subjects are working and teaching according to the teaching duties assigned and have tried to deliver their best teaching performance in the lessons.

3.10 Limitations of the Study

As stated earlier, the purpose of this study is to examine the teaching behaviours of both pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice. The following limitations should be recognized in this study:

1. The investigator, as the co-teacher of the two study groups, might have influenced the results of the study.
2. Twenty pre-service and twelve in-service primary physical education student teachers participated in the first phase of the study and six pre-service and in-service participants continued and took part in the second phase of the study. The results would apply only to the subjects under investigation and might not generalize to other student teachers or settings.
3. Observations and data collection were made of ball games activities taught by each subject. Results could only pertain to ball games activities taught.
4. Each subject in the first phase of the study was only videotaped in two ball game lessons. Each subject in the second phase of the study was limited to two pre-lesson formal interviews, two lesson observations as well as two post-lesson stimulated recall interviews.
5. Lack of control over each subject's teaching context would limit the ability to ascribe the cause of teacher behaviours change to the difference of student teaching experience.

6. The teaching behaviours of the subjects might reflect the requirements of one particular institution since all the subjects come from the same education institution.

3.11 Delimitations of the Study

The investigator assumed the following delimitations:

1. This study was restricted to pre-service and in-service student teachers in a teacher education institute in Hong Kong at the time they undertook acting as the subjects in the study.
2. The subjects in this study were final year students of a two-year full time certificate programme in primary education and final year students of a three-year part time in-service course of training for teachers in primary schools.
3. The applicability of this study was delimited to the teaching behaviours of primary physical education student teachers in ball games lessons during their final year teaching practice in Hong Kong.
4. The teaching behaviours were delimited to the instructional and managerial behaviours types categorized by the Physical Education Teacher Assessment Instrument (PETA) (Phillips, Carlisle, Steffen & Stroot, 1986) as well as the behaviours recorded by the investigator during the lesson observation.

5. The games activities were delimited to basketball, football and volleyball activities that were taught by the student teachers during their final year teaching practice.
6. The beliefs and subject knowledge of the six subjects in the second phase of the study were delimited to the two pre-lesson formal interviews.
7. The comments of the teaching performance in ball game lessons of the six subjects in the second phase of the study were delimited to the two post-lesson stimulated recall interviews (Byra & Sherman, 1993).
8. The thinking and decision process, the pedagogical knowledge and the pedagogical content knowledge of the six subjects in the second phase of the study were delimited to the behaviours recorded by the investigator during the lessons observation as well as the two pre-lesson interviews and the two post-lesson stimulated recall interviews.

Nonetheless, despite these delimitations and limitations, results of the present study did provide further understanding of teaching behaviours in Hong Kong primary physical education, particularly in pre-service and in-service student teachers teaching ball games lessons.

3.12 Definition of Terms

For the purpose of this study, various terms have been operationally defined and put into Appendix 10: ball games activities, beliefs, content knowledge, effective teaching behaviours, in-service primary physical education student

teachers, observation, pedagogical content knowledge, pedagogical knowledge, pre-service primary physical education student teachers, stimulated recall, teaching behaviours, teacher education institute and teaching practice.

3.13 Summary

The primary purpose of this study was to describe and analyze the teaching behaviours of pre-service and in-service primary physical education student teachers in ball games lessons during their teaching practice. In the first phase of the study, twenty pre-service and twelve in-service student teachers served as subjects. A total of 64 lessons were videotaped and systematically observed. During the second phase, three student teachers from each group participated in the study. Qualitative strategies were used to describe and analyze the data from the transcribed interviews, non-participant observation, and transcribed records of stimulated recall sessions. Later data were then analyzed inductively to collect information about the teaching behaviours of both pre-service and in-service student teachers. Lastly, the procedures for establishing trustworthiness of the data had been described.

Chapter 4

RESULTS

The purpose of this study was to describe and examine the teaching behaviours of both pre-service and in-service primary physical education student teachers in ball games lessons. The goal was to provide descriptions and analysis of the pre-service and in-service primary physical education student teachers' teaching behaviours during their teaching practice. The focus was on a comparison of their teaching behaviours as well as offering answers for the differences or similarities between the groups.

This chapter contains the results of the study, presented in the order of the research questions. The chapter begins with a general description of the participants and their teaching environments in the study. This information will help readers to understand more about the background of the participants. Then, the major research questions of the study are presented and answered. Each research question is divided into themes corresponding to the research sub-questions. Both the quantitative data and the qualitative data help to provide answers to the research questions. Quantitative data are confined to the observation data collected by the systematic observation instrument while the qualitative data refer to the data generated from the interviews, stimulated recall sessions and the field notes of all lesson observations.

4.1 General Description of the Participants

There were two groups of student teachers, in-service and pre-service, taking

part in the study. During the first phase, twenty randomly selected pre-service and twelve randomly selected in-service student teachers were asked to videotape their teaching of two ball game lessons during their final practicum and in their own schools respectively. Demographic information related to the participants in the first phase of the study is presented in Table 2. Participants in the pre-service group (9 males and 11 females) aged from 22 to 24 (mean = 22.45) had no teaching experience in physical education. Participants in the in-service group (5 males and 7 females) aged from 24 to 30 (mean = 27.08) had 3 to 7 years (mean = 4.87 years) of teaching experience in primary physical education. In sum, the in-service group was comparatively older and had more teaching experience than their pre-service counterparts.

Table 2
Demographic Information of the Participants in the First Phase

	Pre-Service	In-Service	All
Male	9	5	14
Female	11	7	18
Age	22-24	24-30	22-30
Mean of Age	22.45	27.08	24.19
PE Teaching Experience	0	3-7	0-7
Mean of Year of PE Teaching Experience	0	4.87	1.83
Classes	P.3-P.6	P.3-P.6	P.3-P.6
No. of Students in Class	30-40	30-45	30-45
Mean No. of Students in Class	35.63	37.87	36.47
Teaching Contents	14 Basketball Lessons 14 Football Lessons 12 Volleyball Lessons	11 Basketball Lessons 7 Football Lessons 6 Volleyball Lessons	25 Basketball Lessons 21 Football Lessons 18 Volleyball Lessons

Three in-service and three pre-service student teachers from both groups were also randomly selected and took part in the second phase of the study. There were a total of two females and one male from each group that participated in the later stage of the study. As reported in a previous chapter, in order to protect and gain the trust of the participants, pseudonyms were used throughout the study. Both groups of participants taught in upper primary classes in the study. Sze, Kei, and Ling were allocated to three subsidized primary schools located in Kowloon and the New Territories districts for their teaching practice, while Choi, Yung, and Chu taught in their own primary schools which were situated in the Kowloon and Hong Kong districts. General information about these six participants is presented below.

Sze – Pre-service Participant in a Catholic Primary School

Sze is a 22 year old, single female, who, during data collection, was in the last semester of her teacher certificate programme at an institution of education in Hong Kong. Sze was having her final teaching practicum in a Catholic primary school.

The Catholic primary school in which Sze taught physical education during the practicum was located in the western Kowloon district with students of lower socioeconomic class characteristics. Sze taught in a covered playground and a small nonstandard basketball court open area. She noted that there were limited physical education facilities and equipment in the school. Sze admitted that the contextual limitations influenced some aspects of her teaching practices, including the choice of drills or tasks. "...the real volleyballs were not enough, but I could not control that" (Post-lesson Interview 2, p. 3), "as there were not enough volleyballs, students had to

wait for practice. Lastly, the space was not enough for practising volleyball, this made my planning and class arrangement difficult” (Post-lesson Interview 2, p. 9). Sze also mentioned that the administrators of the Catholic primary school did not support physical education. With limited physical education class time and school culture, Sze sensed that physical education in the school was only treated as a marginal subject. “...the students’ academic results are quite good. However, their standard in PE is not so good because the school doesn’t put too much effort on PE” (Post-lesson Interview 1, p. 1). Anyhow, the school offered two physical education lessons for each level class per week as recommended by the Education Department. Each lesson lasts for 30 minutes.

Sze has been active in sport activities and working as a volunteer Taekwondo and table tennis coach. This sporting background reflects her strong interest in sports activities. She remembered her own school days in a positive manner and has fond memories of the extra-curricular programmes.

I was a volleyball team member in primary school and played school team basketball and table tennis in secondary school. I’ve been coach of Taekwondo and table tennis for a long time. Moreover, I was once selected in HK Team of Taekwondo,...I have played inter-school basketball matches for my secondary school and I have taken part in the Tsuen Wan District Table Tennis Competition. (Pre-lesson Interview 1, p. 1).

With a solid background in sports during her teenage years, her keen interest in physical education and sports continues. Participation and success in school sports events made her feel comfortable and choose a teaching career related to the sports

field. Her involvement in sports activities influenced her teaching philosophy and she found the experience invaluable. She hoped that her teacher certification majoring in physical education would enable her to be employed as a physical education teacher some day. "I am an active person and I'm interested in sports. Physical education teacher seems to be the career that I want" (Pre-lesson Interview 1, p. 1).

When data collection started, Sze was in the fifth week of her primary physical education practicum and she had previously taught volleyball and badminton to both primary four and six students. She is very concerned with the skill level of her students and takes pride in their accomplishments. Success is judged both by the high participation level and success of her students.

Kei – Pre-service Participant in a Christian Primary School

Kei is a 22 year old, single male who was in the final semester of his teacher certificate programme at an institution of education in Hong Kong. Kei's previous teaching experience had included six weeks teaching in general subjects during the first year teaching practicum. He had no experience in teaching physical education in primary schools. At the time data collection began, Kei was at the beginning of the fifth week of his student teaching experience teaching four to six periods a day with students in primary two, three and six in a Christian primary school.

The Christian primary school where Kei was teaching physical education during the teaching practice was located in western Kowloon with students of middle socioeconomic family background. "Most students are from a middle class family,

and their academic results are good” (Post-lesson Interview 1, p. 1). There is limited space for school children to move around in school. There is only a covered playground and a small open area available for physical education classes. The school size is indeed small with only 12 classes. The school provides two thirty-five minute physical education classes for the students each week. However, the resources for physical education lessons were far from enough. “The school is too small. There is no basketball court and there are not enough basketballs” (Post-lesson Interview 1, p. 1). The school administrators were aware of the limited sports facilities and supported the using of public sports facilities in teaching physical education. “The upper classes are arranged to have swimming lessons out of school campus; the lower classes sometimes have PE lessons in a public indoor stadium” (Post-lesson Interview 1, p. 1). However, the school physical education teachers were helpful and supportive to Kei. “...the regular PE teachers helped me a lot. They gave me a lot of advice” (Post-lesson Interview 2, p. 9).

Kei has been an active sportsman since his primary school education. He has coached in youth football leagues for several years.

I am interested in sports since I was a primary student...I am an active person,...Other than football, I played table tennis, track and field and participate in some inter-school competitions for my secondary school. And now I am the football team member of IEd...I have been [football] coach for three years ... I am qualified [Grade D level] to coach primary football teams.

(Pre-lesson Interview 1, p. 1).

Kei's football experience has provided him with opportunities of demonstrating football skills techniques and teaching young children. Being a football coach, Kei has taken great pride in his physical education programme. He loves instructing young children and claims that the biggest thrill in teaching is to see children smile in his lesson. During an initial visit, which was not part of a formal interview, Kei made it clear that he liked coaching football and hoped to coach at the primary school level.

Ling – Pre-service Participant in a Non-profit Organization Primary School

Ling is a 22 year old, single female in the final semester of a teacher certificate programme at an institution of education in Hong Kong. Ling has completed four-fifths of her teacher certification programme course work and was, at the time of data collection, in the fifth week of student teaching at a non-profit organization primary school.

The primary school is located in the northern New Territories where the students have lower socioeconomic class characteristics. According to Ling, her teaching environments were good. The school building was large and in good condition. The sports facilities and equipment were standard for physical education classes. Ling indicated that she liked the fact that she had good facilities in school. The primary school has a covered playground and an open area with a full size basketball court as well as a badminton court beside. "The resources are very new and sufficient for teaching" (Post-lesson Interview 1, p. 1). "...the school has provided me the resources that I need for teaching" (Post-lesson Interview 2, p. 10). The

students are provided two thirty-five minute physical education lessons each week. As the school size is large, there are always at least two physical education classes using the sports ground simultaneously. “The school has 24 classes, with 32 students each” (Post-lesson Interview 1, p. 1). The academic standards of the students are average and they are good at sports. “Their academic are in the average level, but their sports abilities are quite good. They have won prizes in many sports competitions” (Post-lesson Interview 1, p. 1). The school administrators are recognized as supporting the development of physical education and sports activities in school. “The school supports PE very much. It provides many extra-curricular sports activities for students and the students also take part in many inter-schools sports competition” (Post-lesson Interview 1, p. 1). At the primary school, Ling taught primary three and four level physical education, mathematic, Chinese and general studies.

Ling has been active and has liked sports activities since she was a primary school student. “I participated in extra-curricular sports activities and sports competition. I won some medals in sports day and swimming gala. I am most interested and now specialize in dancing” (Pre-lesson Interview 1, p. 1). Ling is specially interested in dancing and she has continuously received training in this area. “I have learnt Chinese dance since primary three and I keep on taking dancing courses. Besides, I gave a dance performance which was held by the district council...currently, I am also the member of the IEd dancing team” (Pre-lesson Interview 1, p. 1). Dancing seemed to be Ling’s major specialized sport activity. At the time of data collection, she chose volleyball as the teaching unit. She

mentioned that she had difficulties in teaching this sports activity and she was unfamiliar with ball games activities. “This is a technique [digging] which I do not know well, and it was not taught during my teacher training. So I have to look up some reference books to search for the teaching points and progression for this skill technique” (Pre-lesson Interview 1, p. 6). Ling is concerned about her programme and sometimes seems to put too much pressure on herself as a student teacher. She would like to see more student involvement in her physical education lessons, and sometimes feels she lacks confidence when teaching physical education. A desire to offer the best programme to her students appears to be her major objective.

Demographic information and teaching schools related to the pre-service participants in the second phase of the study is presented in Table 3.

Choi – In-service Participant in a Private Catholic Primary Girls School

Choi is a 29 year old, single female who has taught at primary school for 7 years. Choi has experience in teaching physical education to students in nearly all primary levels except primary two. Overall she has 6 years of physical education teaching experience. Choi enjoyed teaching in primary school. For the past six years, she has been teaching at a private Catholic primary girls school with four years teaching physical education. Besides having a positive professional relationship with her students, Choi is also a “motivator” whose cheerfulness causes her to be well-liked by her peers. She is actively involved in many school duties and approaches every task with enthusiasm and determination. Although she is experienced in primary school teaching, she needs to seek a qualified teacher status to secure her teaching career.

As advised by her school principal, she selected physical education as the teaching subject in her teacher training programme. "...this is a new challenge for me. I was not a PE teacher before. All because my school principal asked me to select this subject" (Pre-lesson Interview 1, p. 1).

Table 3

Demographic Information of the Pre-Service Participants in the Second Phase

Participants of Pre-Service Groups			
	Sze	Kei	Ling
Sex	Female	Male	Female
Marital Status	Single	Single	Single
Age	22	22	22
Education	HKAL	HKAL	HKAL
Teaching Unit	Volleyball	Football	Volleyball
Teaching Class in PE	P. 4 and P. 6	P. 6	P. 3 and P. 4
Class Time	30 mins.	35 mins.	35 mins.
Students	Lower Class	Middle Class	Lower Class
Type of School	Subsidized Catholic Primary Co-Ed School	Subsidized Christian Primary Co-Ed School	Subsidized Organization Primary Co-Ed School
School Size	24 Classes	12 Classes	24 Classes
School Location	Western Kowloon	Western Kowloon	New Territories (Tai Po)
Coaching Experience	Taekwondo Table Tennis	Football	Dance
PE Teaching Experience	No	No	No

Choi never really participated in a variety of activities during her school days.

Besides taking part in school Sports Days, she did not mention anything about her participation in any sports activities. "I like running, and I had participated in school Sports Day events when I was studying in secondary school" (Pre-lesson

Interview 1, p. 1). It seems that Choi was not an active sports participant and her teacher training in physical education was due to the request of her school principal.

During her teaching career, she had no coaching experience in any sports activities. However, she is eager to equip herself in teaching physical education by enrolling in some sports training courses. “And now, I am taking some PE courses such as aerobics and volleyball training” (Pre-lesson Interview 1, p. 1). Choi has shown her enthusiasm in teaching primary school and tries to upgrade herself by whatever she needs. At the time of the data collection, she also teaches Chinese, mathematics, social studies and moral education from primary four to six respectively.

The primary school which Choi served was a girl’s school and located in eastern Kowloon. The school with a school size of 30 classes was run by a non-profit Catholic Sisters organization. “The school is a girl’s Catholic primary school. The upper grades classes have their lessons in the morning and lower grades classes have lessons in the afternoon” (Post-lesson Interview 1, p. 1). The students are mostly from a good socio-economic family background and their parents much concerned with their academic studies. “Their families are mainly in the middle socio-economic level. They are concerned more about their children’s academic performances” (Post-lesson Interview 1, p. 1). In fact, the school administrators did not emphasize physical education much and they did not put many resources forwards this subject.

I think the principal doesn’t support the subject much. She doesn’t encourage students to participate in any open sports competitions. There are also few

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I understand what are the main points that students should learn and I know how to help students to learn easier...It [teacher training] gives me knowledge about PE.
(Choi, Post-lesson Interview 2, p. 10)

I could understand more about my weaknesses in teaching...makes me understand what are the reasonable requirements from the students...The theory courses have their value. The “curriculum and teaching” modules help my teaching.
(Yung, Post-lesson Interview 2, p. 8-9)

The following are the contributions from the participants in the teacher education programme to the student teachers towards learning to teach mentioned by the student teachers:

He [advisors] gave me much advice on things that I had not noticed before...They [students] made me understand not all students enjoyed their PE lessons. I need to encourage the passive students to participate in the PE lesson and manage those down who are very naughty...He [cooperating teachers] gives me a lot of advice.
(Kei, Post-lesson Interview 2, p. 8)

The regular PE teacher gave me much advice on my teaching...He [advisor] always encourages me. He told me that the mistakes I made in my internship were serious. I knew that I had learnt from these mistakes...My students like PE and they are active. This encourages me much. Moreover, they made me know that I should give clearer instructions in the lesson.
(Ling, Post-lesson Interview 2, p. 9-10)

He [advisor] gave me much advice on teaching. I would consider his advice and see whether I could put them into my teaching...As the girls were so passive, this made me understand how to arrange the teaching plan and the importance of providing some interesting games.
(Choi, Post-lesson Interview 2, p. 10)

My advisor gave me much advice on my teaching...My teaching will depend on the learning abilities of the students. I will change the content accordingly.
(Yung, Post-lesson Interview 2, p. 8-9)

Overall, the student teachers appreciated the learning during teaching practice and requested an increase of the teaching practice period. It is apparent that the two groups of student teachers held similar beliefs of teaching physical education and ball

games. They also expressed that they had gained a lot from the teacher education programme and the teaching practice. As all thinking and decision making that teachers do is influenced by their own sets of educational beliefs or knowledge, there might be a possibility that the two groups of student teachers in the present study possess different knowledge about teaching physical education and games activities even though they held similar beliefs about teaching. This is the next important issue that the investigator is going to look into in the next section.

4.2.8 Did the two groups of student teachers possess different subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games activities?

Research evidence in both fields of general education and physical education indicates that teacher knowledge has influenced the practice of teachers (Calderhead, 1988; Graber, 1995; Rovegno, 1992b, 1992c). Thus, the investigator attempted to examine whether there were differences in teacher knowledge between the two groups of student teachers as they exhibited different teaching behaviours. Three specific types of teacher knowledge were chosen for this investigation as Shulman (1987) had identified them as necessary constituents of the prototype of expert teaching. They were subject matter knowledge or content knowledge, pedagogical knowledge and pedagogical content knowledge. Qualitative data were analyzed and re-analyzed and revealed that there were differences in teacher knowledge between the two groups of subjects.

Subject Matter Knowledge

In general, subject matter knowledge is defined as teachers' knowledge and understanding of the subject they are supposed to teach. According to Shulman (1986), the subject matter knowledge refers to the quantity and organization of the knowledge a teacher has in a given subject. In the present study, the subject matter knowledge is restricted to the ball games knowledge related to the observed games lessons the student teachers taught. When the student teachers were asked about their understanding of the contents they taught, their responses were based on their personal experience of both teaching and learning these games activities. For example, Kei stated he had no problem in teaching football since he was a qualified football coach and had coaching experience in this area, while Yung, Chu and Sze also claimed that they had confidence in teaching football, basketball and volleyball respectively as they learnt these sports skills during their teacher training and sports participation. However, Ling and Choi admitted that they had little experience in volleyball and did not know much about the contents. Here are some examples of their responses in the interviews:

I have taught this content two times in the youth coaching programme. I played football, so it is not hard for me to teach this skill.

(Kei, Pre-lesson Interview 1, p. 7)

I was member of IEd football team, and I had participated in many football competitions...I know the essential part of this skill technique and I understand how to teach the topic to students.

(Kei, Pre-lesson Interview 2, p. 1)

I have taught it before, and I fully understand about the technique. I have experience in playing basketball. Although my skills are not very good, I know the basic skills.

(Yung, Pre-lesson Interview 1, p. 9)

I have never taught it before...I did not have much experience in playing volleyball. I only played volleyball with friends several times. I seek advice from those who are skilled volleyball players. I learn the technique and teaching methods from them. (Ling, Pre-lesson Interview 1, p. 14)

From these responses, it was hard to conclude that the two groups of student teachers possessed different subject matter knowledge as each student teacher had a different background and experience in learning, teaching and coaching the games contents they taught. However, when they were asked whether they had difficulties in preparing the games lesson contents, their responses revealed that the pre-service student teachers had more subject related planning problems than did the in-service group. It seemed that they did not have sufficient curriculum knowledge in games contents. On the other hand, the in-service groups only mentioned that they had contextual related difficulties in planning the lessons. They appeared to understand more about the games contents and curriculum when planning to teach. This implied that the subject matter knowledge of the in-service group seemed to be slightly better than the pre-service group. The following are the difficulties raised by the pre-service groups when planning the teaching of the games lessons:

It's really a difficult task for me. Firstly, I didn't know how to organize the teaching contents. Secondly, the teaching topic was difficult to select. (Ling, Pre-lesson Interview 1, p. 15)

I spent much time on [preparing] the lesson contents because I hadn't taught this skill before. (Sze, Pre-lesson Interview 2, p. 1)

Here are the contextual related difficulties mentioned by the in-service student teachers:

I'm afraid the weather will turn bad. (Yung, Pre-lesson Interview 1, p. 10)

I have to prepare the equipment during recess time.

(Chu, Pre-lesson Interview 1, p. 12)

I have to consider the hot weather and the number of students. These are useful for grouping.

(Choi, Pre-lesson Interview 1, p. 8)

Pedagogical Knowledge

Pedagogical knowledge includes a range of general teaching procedures and abilities within the classroom teaching process. Shulman (1987) defined it as knowledge of “broad principles and strategies for classroom management and organization that appear to transcend subject matter” (p. 8). In this sense, this professional knowledge is closely related to how teachers practise in the classroom. Therefore, the investigator examined the field notes and the interview data and tried to identify the pedagogical knowledge of the student teachers. Four notable categories emerged from the data analysis: a) task presentation, b) organization, c) class management, and d) feedback. These categories were indeed once identified by the investigator when addressing other research questions in the present study. The in-service student teachers seemed to exhibit more effective teaching behaviours than did the pre-service counterparts and possessed better pedagogical knowledge.

a) Task Presentation

The in-service student teachers appeared to have different presentation behaviours to the pre-service groups as identified in other research questions. Although all student teachers claimed that they used explanation and demonstration as the major strategy for presenting the tasks, however, the in-service student teachers employed more efficient instructional strategy than did the pre-service group in real

classroom practice. They demonstrated efficient communicative skills by giving concise explanation and demonstration. In contrast, the pre-service group spent considerable time in introducing the learning skills. On some occasions, the pre-service student teachers only verbally explained the technique and did not provide any demonstration for the students.

She [Chu] gave precise demonstration and also invited a student to demonstrate the skill also...she spent short instruction time in each teaching skill...

(In-service student teacher, Chu field notes 1)

She [Ling] spent quite a lot of time in the introduction of the dig technique. In terms of time spent, she talked a little bit more.

(Pre-service student teacher, Ling field notes 2)

After minutes of practice, Sze stopped the students' practice and asked them to watch the demonstration...She did not perform the technique herself...She again did not demonstrate the technique for the class. She only gave verbal instruction and mentioned the teaching points.

(Pre-service student teacher, Sze field notes 1)

b) Organization

The in-service student teachers also demonstrated that they had better organization skills than the pre-service group in teaching. They were especially good at handling equipment and setting apparatus for the learning tasks. They spent less time in organizing activities, while the pre-service group was less effective in managing the activities and spent longer time in the organizing procedure.

Within a very short time, all three groups had inter-changed their practising activities. This demonstrated the teachers' skill in class organization and management.

(In-service student teacher, Choi field notes 1)

While the students were practising, Chu quickly brought the hoops and set up the equipment for the demonstration of the next task. She was especially outstanding in handling the set up with small equipment.

(In-service student teacher, Chu field notes 2)

She [Ling] distributed the volleyball... She took some time for the organization and demonstration. (Pre-service student teacher, Ling field notes 2)

The students did not group as smoothly as the teacher expected. Sze took some time to settle this grouping. (Pre-service student teacher, Sze field notes 1)

c) Class Management

The in-service student teachers exhibited more effective classroom management behaviours than did the pre-service group. Class discipline was better in their classes. It seemed that their routine training was good and effective. Field notes data indicated that the in-service student teachers actively supervised their class and closely monitored the students' learning performance. On the other hand, more off-task students behaviours appeared in the pre-service group's classes. On some occasions, the pre-service student teachers were not aware of these misbehaviours and did not take any appropriate action.

As she [Chu] found some students did not scatter and stayed together, she immediately went to the students and gave further instruction...Chu was still actively monitoring the class...She spent quite a lot of effort in training the students' class discipline. (In-service student teacher, Chu field notes 2)

...Yung kept on moving around and providing feedback to their performance...the class behaved very well and with good discipline. The students seemed to have good routine training. (In-service student teacher, Yung field notes 1)

Some students were moving around but they did not practise in pairs as requested by the teacher...Ling did not take any immediate remedial action. (Pre-service student teacher, Ling field notes 2)

Some boys misbehaved during the practising time. Sze was not aware of the students' misbehaviours and did not take any immediate action. (Pre-service student teacher, Sze field notes 1)

d) Feedback

The in-service student teachers seemed to provide more frequent feedback to help students learning than did the pre-service group. They were more active in providing feedback to students. Data revealed that they constantly moved around and assisted the students, while the pre-service group was rather passive and even sometimes did not give feedback to the students. They only observed the practising performance of the students quietly.

Yung moved quickly around and gave feedback to the students' performances. He stayed a while with the students who did not perform the technique properly...Yung kept on moving around and providing feedback to their performances. (In-service student teacher, Yung field notes 1)

She [Choi] also kept motivating the students by giving positive feedbacks on their performances as well as instructing them in the proper techniques of stretching. She praised and encouraged the students' performances. (In-service student teacher, Choi field notes 1)

Ling stood still and monitored the students' practice. She did not give feedback nor assist the under-performing students. (Pre-service student teacher, Ling field notes 1)

Three to four girls always stood around and rarely kicked the ball and seldom took part in the activity. Kei only walked and watched how the students participated in the dribbling relays. (Pre-service student teacher, Kei field notes 1)

Pedagogical Content Knowledge

Pedagogical content knowledge received much attention after Shulman's (1986, 1987) seminal work. Shulman suggested this professional knowledge helped to differentiate the teaching expert from the inexperienced. Physical education researchers also demonstrated that amounts and kinds of pedagogical content knowledge affected instruction (Ennis, Muller & Zhu, 1991; Rovegno, 1992c).

According to Shulman (1987), pedagogical content knowledge is the integration of subject knowledge and pedagogical process related to that subject. This knowledge consists of useful forms of representations for the subject matter content knowledge such as analogies, illustration, examples, explanations, demonstrations, learning cues, drills and so on. It is very context and subject specific. For the present study, pedagogical content knowledge of the student teachers was limited to the pedagogical knowledge of games activities teaching in their own contexts. The investigator attempted to find out the differences in pedagogical content knowledge between the two groups of student teachers from their teaching behaviours. From the analysis of field notes data, two salient categories emerged: learning tasks and organization strategy.

a) Learning Tasks

The in-service student teachers chose more appropriate learning tasks for their students. The progression of these tasks was more logical and suitable. They used more refined application tasks for ball games learning, while the pre-service groups employed more inappropriate tasks and did not match the students' learning abilities. Some of the application tasks selected even did not match the lesson objectives.

He introduced and demonstrated the two-handed bounce pass with a student to the whole class...he further demonstrated the progressive task related to bounce pass...He then introduced the 2 vs 1 bounce pass setting to the class. This practice required students to apply the learnt bounce pass technique in game situation.

(In-service student teacher, Yung field notes 1)

She demonstrated the overhead volley pass with a student...She [Choi] then proceeded to another [extending] task. The volleyball was thrown to the right and left side of the receiver. The receiver was needed to move sideways in order to use an overhead volley pass to return the ball...By using 2 skittles and cane as net, the students played the 2 vs 2 modified game using dig and volley pass techniques.

(In-service student teacher, Choi field notes 2)

The students were required to dig in a square setting and direction...The task might be too difficult for the students. Most students could not practise as instructed. The practice was inappropriate to the student abilities. Balls were flying everywhere. (Pre-service student teacher, Ling field notes 2)

Sze did not prepare any progressive tasks for the learning of the serve technique as well as receiving the serve with the dig...The boys were playing the monkey game with two defenders. The game was originated and usually used in the basketball teaching activity. The skills required in the game did not relate to the learning of volleyball. (Pre-service student teacher, Sze field notes 2)

b) Organizational Strategy

Teaching ball games lessons involves the use of ball equipment and a larger space area. These require extra management time in the lessons. Physical education teachers need to know how to minimize management time when handling equipment and organising students in changing learning activities. Data revealed that the in-service student teachers in the present study were skilful in managing students changing the application tasks in games lessons. They employed a specific organizational strategy in handling the application activities transition. The outcomes were effective and saved more practising time for the students. On the contrary, the pre-service groups spent a longer time in organizing these application activities and in turn minimized the learning time of students. It was likely that the pre-service student teachers did not possess this type of pedagogical content knowledge in managing the application activities.

Choi brought the first group to the watch circle setting group...After the short explanation, Choi asked the first group to overtake the circle setting group and practise the dig game in the circle setting. She then brought the circle-setting group to practise rope skipping. Within a very short time, all three groups had inter-changed their practising activities.

(In-service student teacher, Choi field notes 1)

Chu brought the first two groups of students to watch the group three and four students participating in the second applied activity. She supplemented with a brief explanation. Subsequently, she asked groups three and four to stop and leave all the equipment for groups one and two. By using the same organizational strategy,...all six groups had switched and rotated their participation in the different applied activities. This makes the whole class run smoothly... (In-service student teacher, Chu field notes 1)

Ling intended to use the rope and set it as the net in the game...It seemed that there was confusion at this stage...It took her more than 3 minutes for setting up the net. (Pre-service student teacher, Ling field notes 2)

While three groups of students were practising dribbling, Kei brought the remains of the class to the other side of the playground. He spent some time in class management again to settle down the students. He briefed the 5 vs 5 modified game activity to the students for about 2 minutes...he gave quite a long explanation... (Pre-service student teacher, Kei field notes 2)

In all, the two groups of student teacher seemed to possess different teacher knowledge. From the findings revealed above, the in-service student teachers appeared to have better subject matter knowledge, pedagogical knowledge and pedagogical content knowledge as well. As student teachers having different sports participation and teaching experience backgrounds, it was hard to say that the in-service group possesses better subject matter knowledge. However, results from the data indicated that pre-service student teachers had more difficulties in preparing games lesson contents. It seemed that their curriculum knowledge in games was not as good as the in-service group. Moreover, the in-service student teachers demonstrated more effective teaching behaviours in ball games lessons. These included task presentation, activities organization, class management and providing feedback behaviours. This implied that the in-service group possessed better pedagogical knowledge. With respect to teaching ball games, the in-service groups also seemed to have better pedagogical content knowledge. They were identified as

demonstrating more skilful organization behaviours in changing the application tasks and choosing appropriate learning tasks for the students. As studies indicated that teacher beliefs, thinking and knowledge influenced one's teaching, then to what extent did these differences affect the practice of the student teachers in the present study? The issue will be examined in the next section.

4.2.9 How did the student teachers' beliefs, perceptions and their thinking about physical education and teaching ball games lessons influence their teaching?

There is a substantial number of studies supporting the notion that teachers' beliefs exert a certain influence on their classroom behaviours in teaching physical education (Behets, 2001; Ennis, Ross & Chen, 1992; Roberts, 1992). The findings in the present study also confirmed this notion. From the analysis of the data, the results revealed that both groups of student teachers held common beliefs about purpose about physical education and teaching ball games lessons. These beliefs and perceptions about teaching physical education directed the practice of the student teachers.

From the responses in the interviews, it is apparent that the student teachers recognized and appreciated the value of teaching physical education. They believed that school students would gain multiple benefits when participating in physical education lessons. In the long-term, the students would learn sports skills and knowledge; they would develop an interest on sports; they would become more fit

and healthy and develop a positive lifestyle; and they would learn how to cooperate with others in the lessons. It was natural that their teaching acts were close to these beliefs. Their prepared lessons were aimed at achieving these long-term objectives. They expected their students would gain games skills after the lesson. Their classroom teaching behaviours were mainly focused on how to help their students learn games skills in the lesson. This implied their lessons were technically oriented and concentrated on sports skills learning.

Besides, as student teachers believed that successful teaching involved: a) good preparation, b) achieving lesson goals, c) student enjoyment, and d) student participation, it was reasonable to find out whether their planning and teaching strove for producing the above teaching characteristics. For example, whether they would have their lesson prepared before they teach and whether they would design modified games and learning activities that meet the needs of their students. These would insure maximum participation, maximum time on task and success of their students.

The student teachers employed specific teaching approaches and strategies to ensure maximum student participation and learning in the lesson. They adopted the teacher-directed approach and the command and practice styles of teaching in teaching games lessons. By using the direct teaching approach, they directed all the classroom activities and controlled the learning of the students. To assure the maximum participation and learning of the student, they also used partner and small-group practice as well as station settings for the learning of the skill-application activities. Modified and lead up games were concurrently set up to maintain the interest and participation of the students. They were concerned with the positive

feelings of the students when participating in the learning activities.

Besides, the student teachers expressed their concerns about safety when teaching ball games lessons. They saw that teaching ball games was rather dangerous for students as the students sometimes mishandled the ball equipment and got injured. They also mentioned they had more difficulties in class management as they needed to manage the students in a larger space area. They felt that direct instruction was the most appropriate and effective method if they wanted to control the students and their learning with a secure feeling.

From the data revealed in the interviews, the student teachers appreciated their experience in the teaching practice and the training in the teacher education programme. As they believed that they had benefited from the teacher education programme and the teaching practice, they would accept the teaching beliefs espoused in the teacher education institute. Most of them admitted they learnt the basic teaching principles and methodologies from the teacher education institute. The investigator trusted that the major teaching strategies the student teachers employed in teaching practice were learnt from the teacher education institute. In short, it was apparent that the teaching beliefs of the student teachers in the present study were closely related to their teaching behaviours in teaching ball games lessons.

Moreover, educators have suggested that the thought and decision-making process of teachers exerts influence on their actions in the classroom (Cater, Sabers, Cushing, Pinnegar & Berliner, 1987; Housner & Griffey, 1995; Graham, Hopple, Manross & Sitzman, 1993; Griffey & Housner, 1991; Tan, Fincher, Manross, Harrington & Schempp, 1994; Westerman, 1991). The findings in the present study

revealed that there were similarities and differences of thinking between the in-service and pre-service student teachers. Their thought and decision processes were strongly associated with their classroom practice.

With respect to their planning decisions, the in-service student teachers seemed to plan more thoroughly than did their pre-service counterparts. They considered more contextual factors, students' ability and past teaching experience when planning their lessons. By considering these factors, they were better able to anticipate and diagnose problems that might arise in real teaching situations. Alternative ways of carrying out the lesson and contingency plans might then be developed. This implied that their lessons were well prepared and more applicable to their teaching. Conversely, the pre-service student teachers mentioned that they had difficulties in planning the lessons. The investigator realized that the pre-service student teachers might plan their lessons superficially and only focus on the teaching activities. As the pre-service student teachers claimed that they would mostly teach according to their plans, they might face unanticipated problems when teaching. The investigator expected their teaching performance would not be as good as the in-service student teachers.

As both groups of student teachers believed the major purpose of games lesson was developing games skills, it was not surprising to find the student teachers designed different kinds of drills and game-like activities for their students as these activities enhanced skill development.

As mentioned previously, the analysis of the lesson planning of the student teachers revealed that they usually adopted a common lesson structure pattern. The

lesson structure was: warm up, skill learning, game-applied activities and close up activity. This common structure made the student teachers exhibit similar teaching behaviours in the classroom. As the student teachers used a direct instruction approach in teaching, they exhibited similar teaching behaviours in each lesson. These common teaching behaviours involved directing, organizing, demonstrating, informing, observing and providing feedback. In short, the teaching behaviours of the two groups of student teachers were very similar in teaching ball games activities.

For the interactive teaching, the findings in the present study revealed that the student teachers were reluctant to improvise away from the planned lessons. Comparatively speaking, the in-service teachers tended to teach to the script more frequently than the pre-service group when lessons were proceeding as planned. When a lesson was perceived as not progressing as planned, the in-service students tended to implement a new routine to resolve the perceived difficulties. In contrast, the pre-service student teachers tended to continue to teach without deviating from the planned routines. It was possible that the plans might be the only one known by the pre-service student teachers. Besides, the investigator also suspected that changing the routine might overload the student teachers and require them to devote more attention to the routine instead of the student responses. These might explain why the pre-service student teachers were inclined to follow their original plan even perceived as not progressing as planned.

Both groups of student teachers changed their teaching routines (Path 5) when alternatives were necessary and available. The data indicated the pre-service groups reported they altered the lessons more than did the in-service group. This might be

due to the fact that the pre-service student teachers had, or thought they had more problems. The actual and perceived magnitude of these changes might differ for teachers with a different level of experience or expertise. The investigator suspected that the in-service group had fewer real and perceived problems during interactive teaching than did the pre-service group. When problems were noticed, the in-service group was more likely to reject the necessity of immediate adjustment and continued their teaching routines unchanged. When immediate adjustments were considered necessary, they would make them directly. The pre-service group reacted quite differently, sometimes by making adjustments and on other occasions by continuing planned routines because they lack or were reluctant to initiate alternatives.

An interesting finding involved decisions that altered a lesson from the planned routines. Teacher instruction and teacher management were identified as antecedents most often in the in-service student teachers reported decision to change their behaviours, whereas teacher management was identified most often in the pre-service group reported decisions to change their behaviours. These suggested that both groups differed slightly in their perception of lesson events and the understanding of the flow of these events. Both groups focused on classroom management matters when they changed the routine, while the in-service group considered the instruction strategies as well when altering the lesson. It seemed that the student teachers mainly concentrated on their own teaching when perceiving the classroom events. Lastly, the frequency of the overall interactive decision making indicated that the in-service students made more decisions related to the students'

reaction than did the pre-service group. This implied that the in-service student teachers considered student responses when teaching.

For postactive evaluation and reflection, the two groups of student teachers focused on two specific aspects of students' performance in the lesson. They concentrated on games skills development and students' participation in the lesson. Indeed, games skills development was matched with the student teachers' lesson established goals and the teaching strategies employed. This all related to their basic beliefs of teaching physical education. However, the findings in the present study revealed that pre-service student teachers designed some inappropriate learning tasks and employed less effective teaching strategies in their games lessons, so it was not surprising to find that this meant some of their classes did not achieve the lesson objectives. Since they attributed the failure to their less effective teaching strategies, students' learning behaviours and the constraints of the school facilities and resources, this implied that they did not understand much about the teaching of games lessons and that they had responsibilities in conducting effective lessons. It seemed that the postactive reflection of the pre-service student teachers was superficial and did not allow them to identify the main problems of their teaching.

Keeping students "busy, happy and good" had been seen as successful teaching in teaching physical education in some American studies (Arrighi & Young, 1987; Placek, 1983; Placek & Dodds, 1988). The findings in the present study also indicated that the student teachers have this belief as successful teaching aside from achieving lesson objectives. This implied that the student teachers would plan to provide more practise time for their students. They would aim at keeping their

management behaviours time to the minimum. Their tasks presentation behaviours would be concise and precise. These strategies were to insure the maximum participation of students.

As both groups of student teachers reflected that they would consider students reactions and their teaching performance in the past teaching lessons when planning future lessons, it indicated they learnt something in each teaching lesson. By following this reflective process, as their teaching experience accumulates, their teaching development would progress.

Overall, the thought and decision process of the student teachers were closely related to classroom practice during teaching practice. Their beliefs and thinking had exerted influence and directed their planning and teaching behaviours in the games lessons.

4.2.10 How did the student teachers' knowledge with respect to subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games lessons influence their teaching?

Educators have suggested that teachers knowledge is important to good teaching and student understanding (Buchmann, 1982, 1984; Doyle, 1986b; Feiman-Nemser & Buchmann, 1987; Reynolds, 1992; Shulman, 1986). The different types of teachers knowledge that these educators identified are subject matter knowledge, pedagogical knowledge and pedagogical content knowledge. The findings in the present study

also confirmed that these types of teacher knowledge were crucial to the teaching of the student teachers and exerted influence on their practice during the teaching practice.

Subject matter knowledge includes the ideas, facts, and concepts in a field and represents a teacher's comprehension of the content to be taught. Student teachers are expected to be well equipped with this type of knowledge before they teach. However, physical education teacher educators indicated that student teachers might have problems in developing subject matter knowledge (Capel & Katene, 2000; Laker & Jones, 1998). Some student teachers in the present study also mentioned that their subject matter knowledge in games teaching was not well developed before they came to teaching practice. They admitted that they were not familiar with the game contents they taught. They did not have confidence in giving demonstration and feedback to students. Indeed, due to the nature of the subject contents in physical education, it is not uncommon to find that some student teachers might not possess sufficient subject matter knowledge in teaching physical education. In relation to teaching physical education, student teachers are required to have an extensive range of subject knowledge to enable them to teach. They are required to have successfully taught all different areas of activity (games, swimming, athletics, gymnastics, dance and fundamental movement and so on) within the school syllabus suggested by the Education Department to achieve Qualified Teacher Status. As there are many activities to cover, it seems logical that some areas might be less valued and less developed by the student teachers.

Moreover, the pre-service students admitted that they had more problems in planning the games lessons than did the in-service groups. This implied their curriculum knowledge related to games teaching was not well developed. It is logical that the deficiency of game curriculum knowledge might affect the quality of the planning of their games lessons. This helps to explain why the pre-service student teachers had chosen some inappropriate learning tasks which affected the learning of students in games lessons. As there were different supporting behaviours identified between the two groups of student teachers in a previous research question, the in-service group seemed to understand more about the learning of games skills and therefore could give more feedback to the students. It is likely that “the subject matter knowledge matters”.

Besides, the in-service student teachers seemed to demonstrate that they possessed better pedagogical knowledge than the pre-service group by exhibiting more effective and efficient pedagogical behaviours when teaching. As pointed out in a previous research question, the in-service groups were skilful in presenting the learning tasks and organizing the learning activities. They spent comparatively less time in these teaching behaviours. In practice, the lesson time of a primary physical education lesson is thirty-five minutes. They might understand that students practising time is important for student learning in physical education lessons. They need to minimize the management behaviour time as much as possible to save more learning time for the students. The knowledge of task presentation and activities organization have helped them to provide more students practising time. Conversely, the pre-service student teachers spent considerable time in organizing

activities and presenting tasks, and the students in turn had less learning time in the lesson. It is likely that insufficient pedagogical knowledge might affect the effectiveness of the lessons.

In a similar vein, the in-service groups employed more effective classroom management strategies and provided more feedback than did the pre-service counterparts. The in-service student teachers understood that good class management was important to effective teaching. By holding the belief that prevention is better than cure, they provided routine training starting from the beginning of the school term. Besides, they closely monitored and actively supervised their students by moving around in the lesson. It was no surprise to find that the class discipline and student learning behaviours of their classes were better than those of the pre-service student teachers. On the contrary, the pre-service group did not seem to possess pedagogical knowledge of detecting a classroom problem and recognizing the importance of offering feedback to help students learn. They were quite passive in giving feedback and handling classroom misbehaviours.

Lastly, the findings in the present study revealed that pedagogical content knowledge differentiated the teaching of the in-service student teachers and their pre-service counterparts. The in-service group seemed to possess better pedagogical content knowledge in teaching ball games activities. They were able to provide more appropriate progressive tasks for the students. They also used more refined and suitable application activities for learning games skills. This eventually helped the students capture game skills and achieve the lesson goals at the end of the lesson. On the other hand, the pre-service groups did not seem to possess this professional

knowledge and could not select appropriate application tasks related to the lesson objectives. This helps to explain why some of the pre-service student teachers' lessons' objectives could not be achieved.

The in-service group also exhibited their skilful organizational strategy in teaching games lessons. They demonstrated that they could effectively manage the students changing the application activities. This pedagogical content knowledge helped them to save more learning time for students. While the pre-service group did not seem to possess this knowledge and spent a long time handling the application tasks, this in turn caused extra time and minimized the learning of students.

In sum, the two groups of student teachers appeared to possess different subject matter knowledge, pedagogical knowledge and pedagogical content knowledge on teaching ball games activities. These differences in teachers' knowledge were likely to influence their classroom practice and might have contributed to the difference in their teaching behaviours in ball games lessons.

4.3 Overview of the Chapter

The results of the study were reported in this chapter. The chapter started with a general description of the participants and their background information which helped readers understand their teaching contexts. Then the results were presented in the order of the research questions. Both quantitative and qualitative analyses were conducted. With respect to the quantitative analysis, the specific teaching behaviours data of all student teachers, pre-service student teachers and in-service student teachers during teaching practice captured by the PETAI systematic

observation instrument were presented. These gave general pictures of how the student teachers, pre-service student teachers and in-service student teachers spent their time in different teaching behaviours in ball games lessons.

Furthermore, statistical analysis also revealed that in-service student teachers spent significantly higher percentages of time in response presentation and total time in class instruction than the pre-service group. The pre-service group had spent a significantly longer time on planned presentation, equipment management, activities organization, behaviour management and total time in class management than the in-service group. No significant differences between the two groups of student teachers were revealed in the percentage of time spent on monitoring, performance feedback, motivational feedback, beginning/ending class and other tasks not related to instruction.

Analyzing the qualitative data helped to give a better picture of how the student teachers taught and supplemented the understanding of the similarities and differences of teaching behaviours between the two groups of student teachers. It was identified that there were both common and contrasting practices between the two groups of student teachers. Their commonalities were teaching styles, collective behaviours and pedagogical settings in learning. Their contrasting behaviours were presentation, organization and supporting.

Moreover, the qualitative data also indicated that the two groups of student teachers employed common strategies and different tactics when teaching ball games activities. The common teaching strategies adopted by the two groups of student teachers were preventive management, equipment management and task presentation.

The two groups of student teachers however were identified using different teaching tactics in treating interactive class management, activities transition and learning tasks.

When looking into the thought and decision process of the student teachers regarding teaching, differences and similarities were found between the two groups during different stages of teaching in teaching ball games activities. Their common thinking and decision making characteristics were: how they prepared the lessons; how past physical education experience influenced their planning; they designed similar learning activities with a common lesson structure pattern; they tended to teach as planned and were reluctant to improvise; they made interactive decisions relating to their instruction and management matters; they adopted skill learning as the major lesson objectives and treated students' participation as the criterion of successful teaching performance; and they considered their past experience and performance in teaching when planning future lessons.

Their contrasting thinking and decision making features were: autonomy in deciding the teaching content; the attitudes of planning the lessons; the tolerance of perceiving things going poorly in class; the use of information when making in-flight decisions; and the factors considered when planning future lessons.

The interview data also revealed that the two groups of student teachers held similar beliefs and perceptions about teaching physical education and ball games activities. They held similar thinking and perceptions about the function of physical education teachers, good teaching and learning to teach issues. Although they held common beliefs and perceptions about teaching physical education, they appeared to

possess different teacher's knowledge when teaching.

The in-service student teachers seemed to have better subject matter knowledge as they had less games contents planning problems than did the pre-service groups. As the in-service student teachers exhibited more effective behaviours in terms of task presentation, organization, class management and feedback, they also seemed to possess better pedagogical knowledge. With respect to teaching ball games activities, the in-service student teachers employed specific organizational strategies in handling application tasks. They designed more appropriate games learning tasks with suitable progression than did the pre-service group. This implied that they possibly possessed better pedagogical content knowledge than the pre-service student teachers.

As teacher's beliefs exerted influence on classroom practice, it was not surprising to find that the teachings of the student teachers were related to their beliefs. Their classroom behaviours were mainly focused on how to help student learning games skills, as their lesson objective was skill development. The student teachers adopted a teacher-directed teaching approach and specific teaching strategies to ensure maximum student participation and learning in the lesson. They felt that the direct instruction method was the most appropriate and effective if they wanted to control their students and promote learning in a safe environment.

The thought and decision-making process of the student teachers were closely related to their practice in the classroom. With respect to planning, the in-service student teachers were identified planning their lessons more thoroughly. Their lesson plans seemed to be better prepared when compared to the pre-service group.

Thus, the teaching performances of the in-service student teachers were expected to be much better than those of the pre-service group. As the two groups held common beliefs about teaching ball games activities, they both designed common lesson structure patterns in each lesson. They also used drills and games-like activities to help the students gain games skills in the lessons. They both exhibited similar teaching behaviours as they adopted the direct instruction approach in teaching. For interactive teaching, both groups of student teachers were reluctant to improvise away from their planned lessons. The results indicated that the pre-service group reported that they altered the lessons more than the in-service group. This might be due to the fact that the pre-service student teachers had, or thought they had more problems and the in-service group had fewer real and perceived problems during interactive teaching. Besides, both groups of student teachers focused on their own teaching matters when they changed the routine. Overall frequency of decision making showed that the in-service student teachers considered more student responses than the pre-service group when teaching.

For postactive reflection, both groups of student teachers focused on games skills development and students' participation in the lessons. However, the postactive reflections of the pre-service group implied that they did not understand that they were highly responsible for the failure to achieve lessons' objective. As both groups held the belief that students' participation was a major part of successful teaching, the teaching strategies they employed would aim at ensuring maximum participation of students in the lesson. Fortunately, the findings indicated both groups actively reflected on their teaching performance in past lessons. It was

extra-curricular activities on physical education. Moreover, resources for physical education are not enough. Some equipment is very old. The school doesn't have enough money to buy new equipment, we can only use the old ones.

(Post-lesson Interview 1, p. 2).

Anyhow, the school provides two thirty-five minute physical education lessons for each class per week as suggested by the Education Department. The school has limited sports facilities with an open sports ground area and one covered playground for the physical education lessons. Most physical education teachers in the school are enthusiastic about their teaching. Although the open area for physical education lessons is not big, the physical education teachers have tried their best to make use of the sports facilities and Choi is no exception.

Yung – In-service Participant in a Non-Profit Organization Primary School

Yung is a 29 year old, married male who has taught in primary schools for three years. He has stayed in this subsidized primary school for the past two years. Within these three years of teaching, he also taught various levels of primary physical education with two lessons per week in each assigned class. Besides, he also taught mathematics and social studies in his present serving school.

With a concerned and positive attitude Yung continues to seek and provide a quality physical education curriculum for his students. Taking initiative is his strongest characteristic, and his pleasant and helpful personality makes him a valuable attribute to his school. His voluntary involvement with various school committees shows his genuine concern for students' progress. His dedication and

desire to bring out the best in his students has remained a consistent goal throughout his career. Yung attended a local university for his undergraduate degree in physics. After graduation he took up a teaching post in a primary school; he needed to seek a qualified teacher status to safeguard his future career. He found that being a primary school teacher is a suitable career for him. He then decided to take up physical education as his elective during teacher training. "I think it is a meaningful job, and its working hours are stable...I found that I am really suitable for being a teacher after I chose the PE training in IEd. I know that PE is what I am interested in" (Pre-lesson Interview 1, p. 1). Yung claimed that he chose PE training because of his interest in sports. Although he is not a sportsman or coach, he has been a regular sports participant since he was young.

I have liked sports so much since Primary 4. I went jogging and playing football with my friends when I was young. And I kept on doing this every week in my secondary school life...I always play table tennis, badminton and basketball. Before I got married, I still kept on playing these sports once every two weeks. I have represented my faculty in some sports competitions in the University. I have represented my primary school in the track events in athletic meets.

(Pre-lesson Interview 1, p. 1)

The primary school which Yung served was a co-educational school and located in the Hong Kong area. Although the school size was small with only 11 classes, it provided two thirty-five minute physical education lessons for each class of students. Yung feels that the school physical environment is not good and has some negative influence on his teaching physical education. "...the school has to share the

playground with another school” (Post-lesson Interview 1, p. 1). “There is a slope in the playground...I am very concerned with their safety” (Pre-lesson Interview 1, p. 3). He has to pay special attention to the students’ safety when teaching physical education. In fact, the school administrators supported the development of physical education subjects as well as the extra-curricular sports activities in school. “The school has provided financial support [in PE]...Every Friday, they [extra-curricular sports activities] are organized by the PE teachers” for the students (Post-lesson Interview 1, p. 1). Yung also pointed out that school administrators encouraged students to participate in inter-school sports competitions.

Yung thinks that other school teachers tend to treat physical education as a marginal subject in his school. He found that some of them always delayed the lesson time and in turn influenced his teaching “Other teachers have the habit of delaying the lessons in my teaching school. Therefore, I didn’t always have enough time for my PE lesson” (Pre-lesson Interview 1, p. 4).

Yung also describes his students as of low academic ability and with discipline problems “Their academic standards and discipline are not good” (Post-lesson Interview 1, p. 1), “...they mainly came from a lower class family. Many of them were new immigrants from Mainland China” (Post-lesson Interview 2, p. 2). However, Yung did not take these as difficulties or excuses in his teaching. During the interview, the investigator felt the enthusiasm and strong commitments of Yung in his teaching of physical education. Yung has been trying his best and overcoming all the difficulties in daily teaching.

Chu – In-service Participant in a Private Catholic Primary Girls School

Chu is a 24 year old, married female who has taught in primary school for seven years. She has taught physical education, Chinese, mathematics, social science and moral education in various primary levels for the past six years in a private Catholic primary girls school. She is a very friendly and pleasant individual, and has enjoyed her teaching duties in this school. This Catholic primary school in fact is a sister school of Choi's serving school. It is located in the east Kowloon region with a school size of 30 classes. The organization and administrative policies of the school is similar to Choi's school. The family background of the students is good. "It is a private, girl's primary school with 30 classes. Most students come from a middle class family and they are all very self-disciplined" (Post-lesson Interview 1, p. 1). Chu seemed satisfied with the classroom behaviours and learning abilities of the students. "[their learning abilities are] average. They all are self-disciplined" (Post-lesson Interview 2, p. 2). However, Chu felt that the school did not support the development of the physical education much. She commented that the school administrators were indifferent to the subject. Besides providing two regular physical education lessons per week, they did not encourage the development of extra-curricular sports activities in school. "No body makes any suggestions about [the organization of sports activities]...there is only a few [extra-curricular sports activities] in my school.are held on Saturday only which is once per month...Nobody cares [attitudes towards PE lessons] actually" (Post-lesson Interview 1, p. 1). Chu concluded that the school treated the physical education as an ordinary subject with no special demand on either teachers or students.

Similar to Choi's school, Chu's serving school has limited sports facilities and equipment. These may generate difficulties in teaching physical education. Chu pointed out that these in fact are common problems in her teaching "...the playground is too small for playing basketball...there are not enough basketballs in this school" (Pre-lesson Interview 1, p. 11). Facing this restricted teaching environment, Chu worked closely together with her colleagues. They shared teaching ideas among themselves. Chu and her colleagues showed enthusiasm and commitment in teaching physical education in the school.

To Chu, being a school teacher is regarded as a stable job. Chu claimed that she needed a secure job to support her living. This is the main reason for her to choose being a teacher as her working career. Besides, physical education was the only choice she had when compared to other cultural subjects in which she found no interest. After attending some part-time physical education teacher training courses, she became interested in teaching physical education.

Originally, Chu did not have much interest in sports activities. She credits this feeling to her negative experience in physical education during her own school days. Influenced by the teacher education programme, Chu started to generate interest in sports. "I thought that sports would make me very tired and have a painful feeling. So, I didn't have much interest in it...since I studied the IEd teacher education programmes, I started to find interest in sports when I got involved in these training programmes" (Pre-lesson Interview 1, p. 1). She is now a regular sport participant and plays badminton with her family member and friends as leisure activities.

Demographic information and teaching schools related to the in-service participants in the second phase of the study is presented in Table 4. Knowing the background of the participants helps to understand the general viewpoints and concerns of their teaching in physical education. Besides, the descriptions of their teaching schools also permit us to know more about the teaching contexts of the participants. This information is important when we look at their teaching behaviours in the ball games lessons.

Table 4

Demographic Information of the In-Service Participants in the Second Phase

Participants of In-Service Groups			
	Choi	Yung	Chu
Sex	Female	Male	Female
Marital Status	Single	Married	Married
Age	29	29	24
Education	HKAL	HKAL	BA
Teaching Unit	Volleyball	Basketball/Football	Basketball
Teaching Class	P. 6	P. 2, 4 and 6	P. 4
Class Time	35 mins	35 mins	35 mins
Students	Middle Class	Lower Class	Middle Class
Type of School	Private Catholic Primary Girls School	Subsidized Organization Primary Co-Ed School	Private Catholic Primary Girls School
School Size	30 Classes	11 Classes	30 Classes
School Location	Eastern Kowloon	Hong Kong	Eastern Kowloon
Coaching Experience	No	No	No
Teaching Experience in PE	6	3	7

4.2 Analysis of Quantitative and Qualitative Results

The quantitative data captured by the systematic observation instrument and the qualitative data gathered from the two pre-lesson interviews, non-participant lesson observations and the two post-lesson stimulated recall interviews were analyzed. The results presented in relation to the research questions were set out in a previous chapter. The results of the quantitative data addressed research questions one and two and the findings of the qualitative data tackled research questions two, three and four.

4.2.1 How did the primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?

Teaching Behaviours of the Student Teachers

Physical education teacher educators have been interested in knowing how physical education student teachers teach in the gymnasium or sports ground. The systematic observation instrument employed in the present study helps us understand what the student teachers were doing in their physical education lessons. The mean percentages and standard deviations of time spent in various teacher behaviours of the PETAI by the 32 student teachers across all 64 lessons are presented in Table 5. It can be seen that the student teachers spent 77.19% of their time in instructional behaviours and 22.81% of their time in managerial behaviours. Table 5 also shows that they spent 11.52% of their time giving performance feedback, 0.19% of the time providing motivational feedback, and 15.24% of their time helping students learn the

skills by emphasizing and reminding them of major teaching points. Moreover, they also allocated 12.98% of their time explaining and giving demonstrations of the skill introduced and game application, and 37.26% of their time passively observing student practice and learning.

The student teachers allocated much less time to management activities. The breakdown of the student teachers' managerial time indicates that they spent 10.44% of their time in equipment set up and handling, 0.17% of their time to begin and end classes, and 0.18% of their time to complete tasks other than instruction or management. Besides, the student teachers spent 0.67% of their time managing pupils' behaviours and 11.35% of their time organizing the class for learning.

Table 5 Percentages of Teacher Behaviour Time for the Thirty Two Student Teachers across all Sixty Four Lessons

Behaviour	Mean %	Standard Deviation	Low Score	High Score
Instructional Behaviours				
Planned Presentation	12.98	5.19	5.50	30.30
Response Presentation	15.24	8.43	3.10	32.60
Monitoring	37.26	9.07	20.40	57.20
Performance Feedback	11.52	6.32	2.70	30.80
Motivational Feedback	0.19	0.32	0.00	1.40
Teacher Instruction Time	77.19	9.58	52.90	96.30
Managerial Behaviours				
Beginning/Ending Class	0.17	0.43	0.00	2.1
Equipment Management	10.44	6.48	0.80	26.10
Organization	11.35	5.94	2.00	26.90
Behaviour Management	0.67	1.31	0.00	5.70
Other Tasks	0.18	0.62	0.00	3.50
Teacher Management Time	22.81	9.59	3.70	47.10

4.2.2 How did the pre-service primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?

Pre-service Student Teachers

The mean percentages and standard deviations of time spent in different instructional and managerial behaviours of the PETAI by the 20 pre-service student teachers across 40 lessons in the present study are shown in Table 6. Inspection of Table 6 reveals that monitoring behaviour received the highest percentage with 38.29% whilst motivation feedback had the lowest percentage with 0.23% within the instructional behaviours category. Of the managerial behaviours category, the pre-service student teachers spent most time on activities organization with 13.04%, whilst least time on beginning and ending class with 0.25%.

Table 6 Percentages of Teacher Behaviour Time for the Pre-service Student Teachers across Forty Lessons				
Instructional Behaviours	Mean %	Standard Deviation	Low Score	High Score
Planned Presentation	14.01	5.47	5.5	30.3
Response Presentation	10.32	5.12	3.1	25.6
Monitoring	38.29	8.44	22.2	56.1
Performance Feedback	10.33	4.69	2.7	21.7
Motivational Feedback	0.23	0.37	0	1.4
Teacher Instructional Time	73.18	9.14	52.9	92
Managerial Behaviours				
Beginning/Ending Class	0.25	0.49	0	2.1
Equipment Management	12.29	7.03	0.9	26.1
Organization	13.04	6.25	2.3	26.9
Behaviour Management	0.98	1.53	0	5.7
Other Tasks	0.26	0.76	0	3.5
Teacher Management Time	26.82	9.11	8.0	47.1

4.2.3 How did the in-service primary physical education student teachers spend the time in different behaviours in ball games lessons during their teaching practice?

In-service Student Teachers

The mean percentages and standard deviations of time spent in different instructional and managerial behaviours of the PETAI by the in-service student teachers across 24 lessons are shown in Table 7. Table 7 shows that monitoring behaviour received the highest percentage with 35.27% whilst motivational feedback had the lowest percentage with 0.14% within the instructional behaviours category. Of the managerial behaviours category, the in-service student teachers spent most time on activities organization with 8.82%, whilst least time on beginning and ending class as well as tasks not related to instruction with 0.06%.

Table 7		Percentages of Teacher Behaviour Time for the In-service Student Teachers across Twenty Four Lessons		
Instructional Behaviours	Mean %	Standard Deviation	Low Score	High Score
Planned Presentation	11.28	4.28	7.0	23.5
Response Presentation	23.06	6.64	8.2	32.6
Monitoring	35.27	9.92	20.4	57.2
Performance Feedback	13.53	8.08	3.7	30.8
Motivational Feedback	0.14	0.20	0	0.7
Teacher Instructional Time	83.28	6.23	69	96.3
Managerial Behaviours				
Beginning/Ending Class	0.06	0.26	0	1.3
Equipment Management	7.63	4.15	0.8	15.4
Organization	8.82	4.35	2.0	15.9
Behaviour Management	0.15	0.53	0	2.6
Other Tasks	0.06	0.21	0	1.0
Teacher Management Time	16.72	6.24	3.7	31.0

4.2.4 Did the two groups of student teachers exhibit similar or different teaching behaviours?

Statistical analyses revealed that the in-service group had significantly ($p < .05$, two tailed tests) higher percentages of time spent on response presentation as well as total time in class instruction than the pre-service group. Moreover, results also indicate that the pre-service group had significantly ($p < .05$, two tailed tests) higher percentages of time spent on planned presentation, equipment management, activities organization, behaviour management as well as total time in class management than the in-service group. The statistical differences between the percentages of teacher behaviour time of the two groups of student teachers are presented in Table 8. It can also be seen that there were no significant differences of percentages of time spent on monitoring, performance feedback, motivational feedback, beginning/ending class as well as other tasks not related to instruction between the two groups of student teachers.

With help from the analysis of the qualitative data, we can have a better picture of how the student teachers teach in their lessons. The analysis of the field notes data supplements our understanding of their teaching behaviours. The research questions guided the main categories for this study. Categories are represented by quotes from interviews and field notes. With regard to the instructional and managerial behavioural aspects, several major categories emerged from the analysis. The common thread in their classroom practice was teaching style, collective behaviours and pedagogical setting for learning. Their contrasting classroom

behaviours were presentation, organization and supporting.

Table 8 Percentages of Teacher Behaviour Time for the Pre-service And In-service Student Teachers in Sixty-Four Lessons

Behaviour	Pre-service N =40		In-service N =24		t	p
	Mean %	S D	Mean %	S D		
Instructional Behaviours						
PP**	14.01	5.47	11.28	4.28	2.09	0.041
RP**	10.32	5.12	23.06	6.64	-8.60	0.000
M	38.29	8.44	35.27	9.92	1.29	0.199
PF	10.33	4.69	13.53	8.08	-1.77	0.086
MF	0.23	0.37	0.14	0.20	1.07	0.285
TIT**	73.18	9.14	83.28	6.23	-5.42	0.000
Managerial Behaviours						
BEC	0.25	0.49	0.06	0.26	1.93	0.058
EM**	12.29	7.03	7.63	4.15	3.32	0.001
O**	13.04	6.25	8.82	4.35	2.90	0.005
BM**	0.98	1.53	0.15	0.53	3.15	0.003
OT	0.26	0.76	0.06	0.21	1.49	0.142
TMT**	26.82	9.11	16.72	6.24	4.99	0.000

N =64; * * p < .05

Common practice of the pre-service and in-service student teachers:

1. Teaching Style

Both the pre-service and in-service student teachers adopted a teacher-directed approach in conducting their physical education lessons. All the learning activities were teacher-centered. The student teachers dominated and initiated most of the classroom activities. They did most of the talking within the lessons. They structured the learning of the students by informing, directing and explaining. They also provided feedback and corrections to the students' performances. Students were seldom seen asking direct questions during the non-participant observations. A large fraction of teachers' behaviours was directed towards a group or the whole

class. From the analysis of the field notes, little genuine student initiating activity was recorded. In this sense, the student teachers adopted the command and practice styles of teaching (Mosston & Ashworth, 1994). They made all the decisions, directed and designated how students would practise. The following episodes reflected the directed teaching style of the student teachers:

Ling instructed the students to spread out for the stretching exercise...Ling demonstrated the dig technique with two hands in front of the class...she just requested them to follow and practised her introduced skills.

(Pre-service student teacher, Ling field notes 1)

Kei then demonstrated the dribbling technique and dribbled the ball to the other end of the group. Students started the practice immediately after the demonstration. After 1 minute, Kei stopped the class and emphasized the teaching points of the dribbling and ball receiving techniques. He allocated 20 seconds for the students to practise.

(Pre-service student teacher, Kei field notes 2)

Chu gave a demonstration and then asked a student to perform the skill technique in front of the class...all students then spread out quickly and had their own practice. Teacher walked around and gave feedback to the students.

(In-service student teacher, Chu field notes 2)

2. Collective Behaviours

Both the pre-service and in-service student teachers had shared teaching behavioural characteristics in classroom. These behaviours included informing, demonstrating, organizing, observing, providing feedback or correcting. The actual content of these the teaching behaviours appeared to be similar but the proportion of time spent in each category might differ. This collective behaviours may be attributed to the similar routine activities they provided in the lessons. Their lesson activities usually consisted of a warm up, some skill instruction and practice, game application and a closing activity. The student teachers usually exhibit certain classroom behaviours in certain designated learning activities. In other words, these

highly routinized activities made the student teacher produce similar teaching behavioural characteristics. The following excerpts taken from the field notes support this sub-category:

Ling used a whistle to stop the class and asked the students to sit down in front of her (*directing*)...She ordered the students to sit in 4's (*organizing*)...Ling demonstrated the next task with three students (*demonstrating*). She explained the requirements and teaching points in detail (*informing*)...Ling gave feedback and tried to correct their underhand dig technique (*providing feedback and correcting*). (Pre-service student teacher, Ling field notes 2)

Sze asked the boys to practise serving in the open area (*directing*)...She then instructed one student to demonstrate the serve and the other students tried to receive the serve at the other end of the playground (*demonstrating*)...She went to the open area and observed the serving performance of the boys (*observing*). After providing feedback, she also walked around and monitored the practice of the students (*monitoring*). (Pre-service student teacher, Sze field notes 2)

...Choi grouped the students into pairs (*organizing*). She then demonstrated and emphasized the teaching points of the dig technique with a student (*demonstrating*)...Teacher requested the students to space out and practice the technique at arms length (*directing*). While the students were practising, Choi helped and corrected the students individually (*correcting*). (In-service student teacher, Choi field notes 1)

Yung stopped the class and he demonstrated the inside foot pass technique with a student (*demonstrating*)...He instructed all the boys to get the balls for the practice (*directing*)...Yung walked around and gave feedback to the students (*providing feedback*). (In-service student teacher, Yung field notes 2)

3. Pedagogical Setting for Learning

Physical education teachers always try to maximize the learning opportunities of their students in their lessons. The student teachers in the present study are no exception. Due the nature of the lesson content, the student teachers had to make use of the balls to facilitate the students' learning of the related ball skills. The availability of space and balls has become one of the major considerations in ball game teaching. In reality, the opportunity of providing students with individual

practice in the ball games lesson is limited. Group practice becomes the common setting for the learning of ball skills in the lessons. The student teachers used partner and small-group practice settings in the game lessons. Moreover, they also offered station teaching settings for the final game learning activities. Two to three different modified games, lead up games or related skill practice were usually set up concurrently for their students to apply their learnt ball skills in the lesson. The following vignettes depict typical activities settings used by student teachers in their physical education classes:

...the practice setting was to practise in pairs using the underhand dig technique...She ordered the students to sit in 4's...The students were required to dig in a square setting and direction...Ling asked half of the class to practise in single line digging practice and other half practised the [2 vs 2] modified games.
(Pre-service student teacher, Ling field notes 2)

Kei asked students to sit down in groups of 4...he then spread out the groups to practise...Kei tried to refine the technique by requesting students to run to the opposite side and line up behind the receiver after the pass [in the same setting]...Kei asked two groups to practise the previously learnt activity, inside foot passing. He assigned two groups to play the 'monkey' game...
(Pre-service student teacher, Kei field notes 1)

Yung grouped the students in pairs...the students then spread out and practised the bounce pass...He then introduced the 2 vs 1 bounce pass setting to the class...Yung introduced the 3 vs 3 skittle hitting game to the whole class...He then brought the girls to the other side of the playground and introduced another applied-activity, the monkey game.
(In-service student teacher, Yung field notes 2)

Chu grouped the students in pairs...As Chu demonstrated the figure of eight dribbling with the students in the three's setting...her introduction of the first group-applied activity—the captain ball game...As the first two groups of students had started playing, Chu brought the rest of the class to the open area and introduced the second applied activity—dribbling relay.
(In-service student teacher, Chu field notes 2)

Contrasting behaviours between the pre-service and in-service student teachers:

1. Presentation

Providing information about learning activities to the students is one of the essential functions of teaching. Rink (1998) defines this process of providing the information about learning activities to students as task presentation. The skill of this presentation helps the students become familiar with the learning tasks provided. How the teachers present the learning tasks influences the learning of students. From the analysis of the field notes of the teaching, there were some differences in presentation behaviours between the pre-service and in-service student teachers in the present study. This supplements our understanding of why there were significant differences in percentages of time spent on planned presentation and response presentation between the two groups of student teachers. The in-service student teachers adopted a more efficient manner of task presentation. They explained the task in less time and also provided a short precise demonstration for the students. Most of the task information they provided is verbally and visually to help the students understand the performance criteria. Their expectations are clear and consistent. On the contrary, the pre-service student teachers used more time to explain the content of the lesson and did not even model the learning task for the students. Examples of the presentation behaviours exhibited by the student teachers are presented in the following citations from field notes.

Presentation Behaviours of the In-service Student Teachers:

He used a whistle signal to stop and let them to have the side step move. Yung's instruction is fast short...He introduced and demonstrated the two-handed bounce pass with a student to the whole class...His demonstration was clear and fast.
(In-service student teacher, Yung field notes 1)

She [Chu] gave a precise demonstration and also invited a student to demonstrate the skill...she spent short instruction time in each teaching skill...
(In-service student teacher, Chu field notes 1)

By using short clear instruction, students were pushed to group into three within a short time...As Chu demonstrated the figure of eight dribbling with the students in the three's setting, the students understood the organization easily.
(In-service student teacher, Chu field notes 2)

Presentation Behaviours of the Pre-service Student Teachers:

She [Ling] spent quite a lot of time in the introduction of the dig technique. In terms of time spent, she talked a little bit more.
(Pre-service student teacher, Ling field notes 2)

After minutes of practice, Sze stopped the students practice and asked them to watch the demonstration...She did not perform the technique herself...She again did not demonstrate the technique for the class. She only gave verbal instruction and mentioned the teaching points.
(Pre-service student teacher, Sze field notes 1)

Sze gave quite a long instruction and briefing...She explained the applied game activity to the students. She spent quite a lot of time in the explanation by providing too much information at one time.
(Pre-service student teacher, Sze field notes 2)

2. Organization

Efficient organization of learning activities will maximize the learning time of the students in the lessons. Since a certain amount of management, organization and transition time is necessary in physical education, it is critical for teachers to keep these times to the lowest possible amount so as to maintain optimal amounts of time in those segments that lead directly to learning. Pre-service student teachers exhibited different class organization behaviours to their in-service counterparts. They spent a greater time period in organizational detail both prior to and during activity. By contrast the in-service student teachers were more effective within this

perspective. They demonstrated good organization skills. They were better in equipment dealing and handled the apparatus well enough. Besides, the transition time between activities was shorter. Some of the equipment for the next task were always set up while the students were practising. They seemed to be effective classroom managers and little time was devoted to off-task behaviours. This may explain why the pre-service student teachers spent significantly greater percentages of time in activities organization than their in-service counterparts. The following episodes reflected the organizations behaviours of the student teachers in the physical education lessons.

Organization Behaviours of the Pre-service Student Teachers:

She [Ling] distributed the volleyball... She took some time for the organization and demonstration. (Pre-service student teacher, Ling field notes 2)

The students did not group as smoothly as the teacher expected. Sze took some time to settle this grouping. (Pre-service student teacher, Sze field notes 1)

Over three fourths of the students were queuing and waited for serving practice. This was not a good organization for practice. The time on tasks of the students would be low as most of them did not have enough time for practice. (Pre-service student teacher, Sze field notes 2)

...three fourths of the class were standing at the back waiting and watching the practice. It seemed that the organization was not good enough. There are too many students waiting for the practice. (Pre-service student teacher, Kei field notes 2)

Organization Behaviours of the In-service Student Teachers:

Within a very short time, all three groups had inter-changed their practising activities. This demonstrated the teachers' skill in class organization and management. (In-service student teacher, Choi field notes 1)

...all six groups had switched and rotated their participation in the different applied activities. This makes the whole class run smoothly without stopping all students to listen to the instruction and demonstration...this kind of class management strategy saves a lot of organization time.

(In-service student teacher, Chu field notes 1)

Yung tried to make use of every minute of the lesson; he quickly set up some cones on the playground. His intention was to prepare the introduction of the next applied game activity.

(In-service student teacher, Yung field notes 1)

While the students were practising, Chu quickly brought the hoops and set up the equipment for the demonstration of the next task. She was especially outstanding in handling the set up with small equipment.

(In-service student teacher, Chu field notes 2)

3. Supporting

Giving support to students while they are practising will facilitate their learning.

Field notes data indicated that in-service student teachers seemed to exhibit more supportive learning behaviours than did their pre-service counterparts. They were rather active in monitoring the students' performance. They always moved around and stayed close to the students in order to provide feedback. Proximity control and warm supportive behaviours were recognized. Students should sense that teachers are concerned and care about their learning. In addition, the in-service groups behaved more energetically and enthusiastically in their teaching. They can be described having good 'withitness' and were able to monitor class events while doing other things at the same time. On the other hand, the pre-service student teachers were comparatively passive in monitoring the students practice. They usually stood still and observed with less time supervising student performance. The following episodes reflected the supporting behaviours of the student teachers during the physical education lessons.

Supporting Behaviours of the In-service Student Teachers:

Yung moved quickly around and gave feedback to the students' performances. He stayed a while with the students who did not perform the technique properly...Students practised this refined drill and Yung kept on moving around and providing feedback to their performances. Yung was energetic and keen on his teaching. (In-service student teacher, Yung field notes 1)

She [Choi] also kept motivating the students by giving positive feedback on their performances as well as instructing them the proper techniques of stretching. She praised and encouraged the students' performances. (In-service student teacher, Choi field notes 1)

As it is hot and sunny, she asked all the students to sit in the shady area to listen to her introduction...Chu asked all students to gather under the shaded area and listen to her further instruction. She was concerned about the uncomfortable feelings of the students while practising under the hot sunny weather. She seemed care about her students. (In-service student teacher, Chu field notes 1)

Supporting Behaviours of the Pre-service Student Teachers:

Ling stood still and monitored the students' practice. She did not give feedback nor assist the under-performing students. (Pre-service student teacher, Ling field notes 1)

She [Sze] went out to the open area and observed the serving performance of the boys. After providing feedback, she also walked around and monitored the practice of the students...Sze spent all her time in the serving game activity by counting the scores of the students. She did not monitor how the students played the monkey game in the covered playground. (Pre-service student teacher, Sze field notes 2)

Three to four girls always stood around and rarely kicked the ball and seldom took part in the activity. Kei only walked and watched how the students participated in the dribbling relays. (Pre-service student teacher, Kei field notes 1)

On the whole, since the in-service student teachers demonstrated some efficient instruction and managerial behaviours in the lessons, the students practice time was maximized. They had more on-task movement behaviours. On the other hand, as the pre-service groups did not exhibit as much competent instruction and managerial

behaviours as the in-service student groups in the lessons, the students' activity time was less. They had more off-task organizational behaviours. Besides teaching behaviours, did the two groups of student teachers adopt different strategies to help their students learning in the lesson?

4.2.5 Did the two groups of student teachers use similar or different teaching strategies in ball games lessons?

To increase student learning, physical education teachers try to develop high levels of student engagement with the content. Engagement with the content is a necessary condition for learning and it is also a minimum criterion for effective teaching (Rink, 1998). To achieve high levels of student engagement in the learning activities, the teachers usually adopt a variety of teaching strategies to ensure the students are able to function within these strategies. Rink (1998) defines teaching strategy as a framework for instruction around which teaching functions are performed in a lesson. The selection of a strategy depends on the objectives of the teacher regarding instruction, the learning content, the characteristics of the students and contextual factors. Metzler (2000) categorizes teaching strategies into two main groups of operation: managerial and instructional. Each group of strategies contains specific actions that teachers complete in order to promote the learning outcomes within each.

After understanding more about the complexity of the teaching process, we learn that a teacher rarely stays with one single strategy in a single lesson. In reality, the

teacher will use different strategies for different purposes and in different contexts. It is expected the student teachers in the present study will adopt a variety of teaching strategies in their teaching. From the analysis of the interviews and field notes, several categories emerged with respect to the managerial and instructional strategies employed. The common strategies of the two groups of student teachers were preventive management, equipment management and task presentation. Their contrasting teaching tactics were interactive class management, activities transition, and learning tasks.

Common teaching strategies adopted by the pre-service and in-service student teachers:

1. Preventive Management

Good class management is essential to effective teaching. Effective physical education teachers usually introduce certain managerial strategies to prevent or reduce instances of managerial problems in complex physical education settings. Their main purposes are to minimize the likelihood of behavioural problems in class in order to increase time on task and student learning. The student teachers in the present study seemed to recognize the importance of preventing management problems occurring in class. Most student teachers said that they would establish rules and routines for their classes. They claimed that they would tell the students the class rules and their expectations at the first lesson. They trusted that reinforcing routines would help to minimize the opportunity for students misbehaviours. The following quotes from the pre-lesson interviews are examples of the management strategy that student teachers used to prevent classroom discipline problems:

To let the students know my [Sze] requirements in the first lesson. Otherwise I will punish them if necessary. (Sze Pre-lesson Interview 1, p. 6)

To state out my requirements and expectations clearly. I also set rules for the students to follow. (Kei Pre-lesson Interview 1, p. 6)

To teach and to train them how to behave properly in PE lessons at the beginning of the year. I also remind them again if they do not follow my instructions. (Chu Pre-lesson Interview 1, p. 9)

By the routine training. I have to tell the students how they should behave in the lesson clearly. (Yung, Pre-lesson Interview 1, p. 7)

Besides, from the non-participant observation of the teaching lessons, the investigator was strongly impressed by the instant activity introduced by the student teachers. The student teachers started their teaching as soon as they brought the students into the playground. The investigator trusts that the student teachers believe providing instant learning activities would reduce the opportunity for misbehaviour to occur. It is apparent that this deliberate action is a popular management strategy of student teachers at the start of class.

2. Equipment Management

Instructional time can be lost when teacher is spending much time in arranging equipment during the lesson. An improper way of equipment arrangement increases management time and loses lesson momentum as students wait for the next activity to be organized (Siedentop & Tannehill, 2000). If possible, effective teachers usually have their equipment arranged before students arrive at class. They place the equipment in close proximity to where they will be set up and have students assist in arranging it for use. Data of the field notes indicated that the student teachers in the present study have students assist with equipment dispersal and return. This reduces

management time considerably and keeps students involved in the flow of the lesson.

The student teachers gave clear directions and made this kind of transition quickly

and in an orderly fashion. The following episodes gave the examples of this

equipment management strategy:

She [Ling] requested the students to bring the basket of volleyballs out from the equipment room...She also asked one student to bring out ropes and play the 2 vs 2 modified games. (Pre-service student teacher, Ling field notes 2)

Kei asked some students to bring the cones from the equipment room for the setting up of the next activities...He asked the students to put away the cones and line up in the covered playground.

(Pre-service student teacher, Kei field notes 2)

He [Yung] instructed all the boys to get the balls for the practice. The students moved and got the balls in good order...Some students helped and collected the footballs to the equipment room.(In-service student teacher, Yung field notes 2)

Following the instruction, the students got the balls in an orderly fashion and quickly... She [Choi] then asked some students to put away the volleyballs.

(In-service student teacher, Choi field notes 1)

Choi asked some students to put back the balls while the others were having their warm down exercises... (In-service student teacher, Choi field notes 2)

3. Task Presentation

Teachers must provide information about the learning task before students can begin to pursue the task. Physical education teachers use different types of strategies for presenting tasks to students. Whatever strategy they use, they aim at providing the clearest task presentation information in the shortest amount of time that facilitates students' learning. Post-lesson interview data indicated that the student teachers in the present study preferred using a more directed type of presentation method, "tell and show" strategy. When they were asked their usual ways of presenting the teaching contents in the lessons, most of them admitted that

they used the direct instruction method by having explanation and giving demonstration as the common presentation strategy during teaching.

By verbal explanation and demonstrations. I [Kei] will also give them some instructions for what to do. (Kei Pre-lesson Interview 1, p. 4)

Mainly by demonstration and explanation. (Ling Pre-lesson Interview 1, p. 7)

Explaining how to do the skill first and follow by demonstration... (Chu Pre-lesson Interview 1, p. 8)

I will give the demo myself first. And then ask the students to try the skill themselves. Students would have deeper impression if they see the demos correctly. (Yung Pre-lesson Interview 1, p. 5)

It seemed that the student teachers believe providing verbal and visual information together will help students to capture the accuracy of the task presented. Besides, they also used attention signals, by hand or whistle, to get students to stop and pay attention to the teachers' further instruction. This is also one of the effective communication strategies that the student teachers employed to help students get ready to receive the information presented. Indeed, teaching episodes taken from the observation field notes also supported the evidence that student teachers used explanations, demonstration and attention signals as the major communication mode of presentation. For content presentation, they either demonstrated the techniques themselves or asked the students to assist the demonstration. In practice, most of them would supplement the demonstration with verbal explanation.

Ling used a whistle to stop the class and ...Ling demonstrated the next task with three students. She explained the requirements and teaching cues in detail...Ling whistled and asked the students to sit in front of her... (Pre-service student teacher, Ling field notes 2)

Kei then demonstrated the dribbling technique and dribbled the ball...Kei stopped the class and emphasized the learning cues of the outside foot dribbling technique. (Pre-service student teacher, Kei field notes 2)

She [Choi] then demonstrated and emphasized the learning cues of the dig technique with a student...she used hand signals to rotate the groups and inter-changed the activities again.(In-service student teacher, Choi field notes 1)

Chu used hand signals to assist her further class organization in groups gathering... Chu gave a demonstration and explanation to the students about the basic dribbling technique without movement...Chu gave a hand signal and gathered the students again. (In-service student teacher, Chu field notes 1)

Data of the field notes indicated that the in-service student teachers employed more teaching strategies than did their pre-service counterparts. The notable differences of the teaching strategies were as follows:

1. Interactive Class Management

Most class management strategies are planned before the lesson. However, teachers need to make some management decisions and actions within the lesson periods when they are teaching. These interactive management actions involve consideration of many things going on at the moment. The success of the lesson will depend on the teacher's effectiveness during these interactive managerial times. Effective interactive managerial strategies will minimize the disruption and maintain the momentum of the lesson. Data of field notes indicated that there were some differences between the two groups of student teachers in their interactive management strategies. Although there were not many discipline problems identified in the pre-service student teachers' lessons, the pre-service student teachers did employ some inappropriate and less effective interactive managerial actions during their lessons. They were not very aware nor did they take any immediate

action when students' misbehaviours arose. Time out for the misbehaving students and the class was the only immediate managerial strategy that was identified in the lessons observed.

Interactive Management actions of the Pre-service Student Teachers:

Some students were moving around but they did not practise in pairs as requested by the teacher...Ling did not take any immediate remedial action.
(Pre-service student teacher, Ling field notes 2)

Some boys misbehaved during the practising time. Sze was not aware of the students' misbehaviours and did not take any immediate action.
(Pre-service student teacher, Sze field notes 1)

He [Kei] stopped the class when he saw there were misbehaviours in the class. He reminded them of the practising procedure and the requirements of students' behaviours.
(Pre-service student teacher, Kei field notes 1)

Kei punished four students for their misbehaviours during the free running activity. They were asked to stand at the corner of the playground...Some boys were fooling around and did not line up properly. Kei did not notice and had not taken any action.
(Pre-service student teacher, Kei field notes 2)

Comparatively speaking, the classroom discipline and student behaviours were better in the in-service student teachers' lessons. Due to their effective routine training and active supervision with proximity control, students' off task behaviours was rarely seen in their lessons. The effective interactive managerial strategy of the in-service student teachers was to prevent students' misbehaviours from happening by active supervision and closely monitoring students' performance. They moved actively around and supervised student work as well as providing feedback during task engagement. Besides, the in-service student teachers would know their students better than their pre-service counter parts as they met and taught their students more regularly. By understanding more about their class students, the in-service student teachers could manage their classes more easily. This explained

why there were significant differences in percentages of time on behaviour management between the two groups of student teachers.

Interactive Management actions of the In-service Student Teachers:

...Yung kept on moving around and providing feedback to their performance...the class behaved very well and with good discipline. The students seemed to have good routine training.

(In-service student teacher, Yung field notes 1)

They [the students] seemed to behave very well and with good discipline. The students must have good routine training...Choi walked around and gave feedback and supported students learning.

(In-service student teacher, Choi field notes 1)

While the whole class was practising, Chu moved around to each group and gave feedback and assisted their learning...the smooth running of the class may be due to her excellent routine training...

(In-service student teacher, Chu field notes 1)

As she [Chu] found some students did not scatter and stayed together, she immediately went to the students and gave further instruction...Chu was still actively monitoring the class...She spent quite a lot of effort in training the students' class discipline.

(In-service student teacher, Chu field notes 2)

2. Activities Transition

Time management is important to physical education teachers. They aim at providing maximum learning time for students in their lessons. However, some amount of management and transition time is necessary in physical education lessons. Effective teachers will keep these times to the lowest possible amount. With regard to this aspect, the in-service group seemed to have done a better job than their pre-service counterparts. The in-service student teachers employed activities management strategy to minimize the transition time between learning tasks. They demonstrated that they could prepare for the next activity while the current one was going on. A "change of scenery" would be made quickly and safely without interrupting the flow of the lesson much. Besides, they also used special strategies

in organizing the group applied skill activities without interrupting the flow of the lessons. The following teaching episodes reflected the effective management strategy in organizing the group applied skill activities:

...he [Yung] quickly set up some cones on the playground. His intention was to prepare the introduction to the next applied game activity...Yung brought the boys groups to watch the monkey game played by the girls groups. He supplemented the requirements of the game activity. Then he instructed the boys and groups to interchange the applied group activities.

(In-service student teacher, Yung field notes 2)

Choi brought the first group to the watch circle setting group. She explained the requirements of the game. After the short explanation, Choi asked the first group to overtake the circle setting group and practise the dig game in the circle setting. She then brought the circle-setting group to practise rope skipping. Within a very short time, all three groups had inter-changed their practising activities.

(In-service student teacher, Choi field notes 1)

Chu was dividing the playground into districts by using skittles while the students were practising. She seemed to prepare the group-applied activities for the later stage. She was using every minute of the lesson...Chu brought the first two groups of students to watch the groups three and four students participating in the second applied activity. She supplemented with a brief explanation. Subsequently, she asked groups three and four to stop and leave all the equipment for group one and two. By using the same organizational strategy,...all six groups had switched and rotated their participation in the different applied activities. This makes the whole class run smoothly...

(In-service student teacher, Chu field notes 1)

On the other hand, data of field notes showed that the pre-service student teachers spent some time in the organization and management of the learning activities. Their activities transition time is comparatively longer. It involves considerable management time and in turn reduces the learning time of the students. The following were the examples of their less effective activities management during the lessons:

Ling intended to use the rope and set it as the net in the game...It seemed that there was confusion at this stage...Ling tried to use a rope to set up a 'net' for the students. It took her more than 3 minutes for setting up the net.

(Pre-service student teacher, Ling field notes 2)

Sze used a long rope to set up as a net for the game. There seemed to be some confusion at this moment...They [the boys] all stood still in the covered playground and waited for further instruction...After some time, the boys started the captain ball game activity. (Pre-service student teacher, Sze field notes 1)

Kei asked some students to bring the cones from the equipment room for the setting up of the next activities. It took the students some time to accomplish this task...While three groups of students were practising dribbling, Kei brought the remains of the class to the other side of the playground. He spent some time in class management again to settle down the students. He briefed the 5 vs 5 modified game activity to the students for about 2 minutes...he gave quite a long explanation... (Pre-service student teacher, Kei field notes 2)

As the two groups exhibited different abilities in employing different management strategies in the classroom, this supplemented why there were significant differences in percentages of time spent in organization and equipment management between the two groups of student teachers.

3. Learning Tasks

Appropriate learning tasks designed and chosen for student engagement are essential to student learning. Physical education teachers use appropriate strategies to ensure the chosen tasks facilitate the learning goals and provide students with the maximum amount of successful engagement. Rink (1998) pointed out that learning games sports skills is different from learning other individual motor skills. As games skills are open skills and they are needed to be applied in the game itself, teachers should adopt an appropriate teaching strategy to help students capture the ability to use sport skills in a game situation when teaching games lessons.

Therefore, the learning tasks of the student teachers in their games lessons should be

specific to games skills learning. Macfadyen and Osborne (2000) suggested that contextualized games activities of 2v1, 2v2, 3v2, and 4v4 are relevant for upper primary students to develop their games skills. The tasks selected should match students' abilities so as to give them a sense of competence. Learning activities should also include all students playing opponents which allows them to experience a range of challenges and degrees of success.

From the pre-lesson interviews, the investigator found that both groups of student teachers were not aware that they should employ special teaching strategies to help students learn games skills in the lessons. They claimed that they used the direct instruction method in teaching games just like teaching in other sports activities lessons. One student teacher stated that there would be differences in employing resources and facilities, "but in the teaching methods and arrangement, [they claimed] their differences are not so obvious" when comparing teaching games to other sports activities lessons.

Although such responses were obtained in the interviews, analysis of the field notes data indicated that the learning tasks chosen were slightly different in real practice between the two groups of student teachers. Some of the tasks selected by the pre-service students were inappropriate for games skills learning. The difficulties of their tasks did not match the students' abilities and some did not follow a logical progression extension. Some skill-applied games selected were also mismatched to the games contents. On the other hand, the in-service group used more suitable learning tasks for the classes. Tasks offered provided good sequence learning experiences and opportunities to apply games skills. There were more

appropriate modified and lead up games in their lessons. The following are examples of the inappropriate learning tasks of the pre-service student teachers:

The students were required to dig in a square setting and direction...The task might be too difficult for the students. Most students could not practise as instructed. The practice was inappropriate to the student abilities.

(Pre-service student teacher, Ling field notes 2)

Almost half of the class could not receive the serve. In fact, Sze did not prepare any progressive tasks for the learning of serve technique as well as receiving the serve with the dig...The boys were playing the monkey game with two defenders. The game was originated and usually used in the basketball teaching activity. The skills required in the game did not relate to the learning of volleyball.

(Pre-service student teacher, Sze field notes 2)

On the other hand, analysis of the observation field notes data showed that the in-service student teachers presented more progressive learning tasks for their students. They provided more refining, extending and application tasks. The following were extracts from the field notes which supported this sub-theme:

He introduced and demonstrated the two-handed bounce pass with a student to the whole class...he further demonstrated the progressive task related to bounce pass. The student was required to give a hand signal and move laterally and receive a bounce pass from his/her partner...He then introduced the 2 vs 1 bounce pass setting to the class. This practice required students to apply the learnt bounce pass technique in a game situation.

(In-service student teacher, Yung field notes 1)

She demonstrated the overhead volley pass with a student...She [Choi] then proceeded to another task. The volleyball was thrown to the right and left side of the receiver. The receiver was needed to move sideways in order to use the overhead volley pass to return the ball...Choi instructed the whole class to watch the group-applied game designed for them...By using 2 skittles and cane as net, the students played the 2 vs 2 modified game using dig and volley pass techniques.

(In-service student teacher, Choi field notes 2)

Chu then demonstrated another new skill technique to the students—high dribbling moving forward...After two minutes, Chu asked the students to practise and dribble a longer distance...She [Chu] introduced the extending task by requesting the students to dribble around the unmoved partner standing at the far end and return to the starting position.

(In-service student teacher, Chu field notes 1)

In all, the implementation of the teaching strategies is based on the teachers' abilities and performance. The qualitative data in the study revealed that the in-service student teachers adopted more effective teaching strategies than did the pre-service counterparts. It seemed that the two groups of student teachers possess different abilities in teaching, as teaching involves a chain of teacher decision making in different stages (Jackson, 1968) and a teacher's decision making will organize and direct his or her behaviours and form the context for teaching. Then did the two groups of student teachers make different decisions during teaching ball games activities?

4.2.6 Did the two groups of student teachers make similar or different decisions in teaching ball games activities?

Classrooms are complex environments which are characterized by great amounts of information and stimuli being emitted simultaneously. Based on this dynamic nature, a teacher needs to make decisions to keep the teaching schedules in good progress and maintain the class in harmony in order to meet the established lesson goals. Shavelson (1973) characterized decision making as a basic teaching skill and stated that it was closely involved in a teacher's professional practice. Jackson

(1968) depicted the complexity of the classroom and described how teachers made decisions before, during and after teaching as preactive, interactive and postactive respectively. The decisions that teachers make during different stages of teaching are of obvious consequence and directly influence the learning of the students.

Therefore, to study the thinking of the two groups of student teachers during three stages of decision making when teaching ball games activities: preactive or planning, interactive or teaching, and postactive evaluating and reflecting will help us understand more about their teaching during their teaching practice.

With the help of the data gathered in the pre-lesson interviews and stimulated recall interviews, the investigator examined how the student teachers plan, teach and evaluate in their teaching. As the data were analyzed and re-analyzed, the results revealed that there were similarities and differences of decision makings between the two groups of subjects during different stages of teaching.

Teacher Planning

During the process of teaching, physical education teachers need to decide and make a series of decision about their practice to facilitate the learning of the students. Mosston and Ashworth (1994) suggested that decisions about teaching practices in the classroom are made “preimpact” or before class. These teaching practices can either be retrieved from memory or created from scratch. Once the planned practices are developed, they seem to function as a mental script or plan that gets carried out during interactive teaching. They maintain the lesson flow and keep learner responses within tolerable limits. These planned practices indeed influence

what goes on in the interactive teaching environment. Yinger (1979) claims that “teacher planning is the major tool by which teachers manipulate the environments that later shape and control their own behavior” (p. 164). In other words, these preactive teacher decision makings influence interactive teaching behaviours to some extent. The data of the pre-lesson interviews indicated that notable differences and similarities in categories emerged between the two groups of student teachers in decision makings during the preactive stage of teaching: a) plan development, and b) plan usage.

a) Plan Development

The two groups of student teachers admitted that they all developed teaching plans before they teach. They seemed to treat this planning as important to their teaching and used all kinds of available resources to help their planning. When they were asked about the resources they would use to help their planning, reference books, lecture notes, videos and coaching materials were named as the usual resources used for the preparation. Besides, they also claimed they would consult lecturers, friends, classmates and senior teachers for advice and discussion about their planning.

I will read some reference books and the lecture notes from IEd...I may get some teaching experience from these courses. I will also seek advice from other teaching staff.

(Yung Pre-lesson Interview 1, p. 6)

I will read some reference books, notes from IEd, and the PE syllabus outline suggested by the Educational Department. I sometimes watch the related sports videos.

(Choi Pre-lesson Interview 1, p. 5)

These include reference books and notes from IEd. Advice from other PE teachers and friends are also important to me. (Kei Pre-lesson Interview 1, p. 5)

I looked up some reference books and seek advice from other teachers or classmates.

(Ling Pre-lesson Interview 1, p. 9)

When looking into the teaching contents prepared by the student teachers, the student teachers primarily relied on the physical education curriculum set by the school or took the syllabus suggested by the Education Department as major references. The pre-service student teachers claimed the schools allocated in their teaching practice allowed flexibility for them and they could choose whatever contents were suitable for their students. However the in-service student teachers seemed to have little autonomy in deciding the teaching contents for the classes. They had to teach according to the curriculum preset by the respective school subject panels.

I will take the curriculum guides proposed by the Education Department as references. Besides, I also personally choose some sports activities that are suitable for school children. (Kei Pre-lesson Interview 1, p. 4)

I will base it on the ability of the students, e.g. to primary students, I will teach them some basic sports skills. I will take the curriculum outline suggested by the Educational Department as reference. (Sze Pre-lesson Interview 1, p. 3)

It is [teaching content] based on the curriculum set by the school. (Yung Pre-lesson Interview 1, p. 6)

In the beginning of the semester, the head of PE in my school will coordinate the curriculum planning. The teaching contents are all referring to the PE curriculum suggested syllabus by the Education Department. (Choi Pre-lesson Interview 1, p. 4)

In practice, the student teachers needed to develop their own sequence of the contents and the learning activities within each lesson. There were some differences in planning these learning activities. The in-service student teachers were more serious and considered more variables that might influence their teaching. Numbers of students, school facilities and resources, weather and the teaching contents are

among these considered factors. They were more sensitive to the contextual factors in the actual teaching situation. They also took the students' ability and the past teaching experience of teaching the same content into consideration.

I will consider students' ability, the school facility and equipment.
(Yung Pre-lesson Interview 1, p. 6)

I have to know what I am going to teach, what resources I need, and have to consider which venue I will use. I also need to consider the weather.
(Choi Pre-lesson Interview 1, p. 5)

The in-service student teachers would adjust their planning according to the understanding of the students' ability based on their teaching experience.

I will adjust my objectives according to the ability of the students...I understand how students learn in a better way. I would take their ability into consideration.
(Yung Pre-lesson Interview 1, p. 9)

With past experience, I have confidence to teach them in a better way. I understand what they will do and I will emphasize the main points of the skill technique...As I have taught this content before, I know students will have difficulties in learning the technique...needs particular attention and strengthening their practising.
(Choi Pre-lesson Interview 1, p. 7)

Conversely, the pre-service student teachers did not mention many factors when planning. They admitted that they had problems and difficulties when preparing the lessons. Some of the difficulties they raised were choosing and organizing the learning activities, short lesson time and the use of the appropriate equipment. It seemed that they planned the lesson superficially and focused only on teaching content. They might not identify some contextual problems that arise in the real teaching situation. Here were some of the problems that the pre-service student teachers stated in their interviews:

I found some soft volleyballs have got wet. There will be fewer resources that I can use in the lesson.
(Sze Pre-lesson Interview 1, p. 8)

I spent much time on [preparing] the lesson contents because I hadn't taught this skill before.
(Sze Pre-lesson Interview 2, p. 1)

Lesson time is not enough...it is quite difficult for me to know their ability in football.
(Kei Pre-lesson Interview 1, p. 8)

It's really a difficult task for me. Firstly, I didn't know how to organize the teaching contents. Secondly, the teaching topic was difficult to select.
(Ling Pre-lesson Interview 1, p. 15)

Lastly, the data of the pre-lesson interviews indicated that the childhood physical education teachers of the student teachers and their experience of childhood physical education lessons had exerted influence on their planning of the teaching. What they experienced during childhood physical education lessons was closely related to their planning. The in-service student teachers said that they would not adopt the teaching strategies of their childhood physical education teachers as they gave them a negative experience. On the contrary, the pre-service group claimed that they would copy the teaching methods of their previous physical education teachers as they had pleasant feelings and a positive experience in the physical education lessons. They wanted their students to share the same positive feelings as they had during childhood. Here are some extracts of the interviews of the in-service student teachers on the negative experience of their childhood physical education lessons:

my childhood PE lessons were very harsh. I always felt tired after the PE lessons. Therefore, I will plan my teaching activities according to the students' abilities now.
(Chu Pre-lesson Interview 1, p. 10)

We had our PE lessons in a public playground outside the school...we didn't have enough time to learn and play. Therefore, I will try my best to provide more time for my students in their PE lessons now.
(Choi Pre-lesson Interview 1, p. 7)

...they have some negative influences on me. They help me understand that a good PE lesson should be well planned. (Yung Pre-lesson Interview 1, p. 8)

The following are extracts from the interviews of the pre-service student teachers on their positive experience of childhood physical education lessons:

As I enjoyed my childhood PE lessons, so I hope my students will also enjoy my PE lessons. (Kei Pre-lesson Interview 1, p. 7)

My secondary school PE lessons were very free. Students enjoyed the lessons very much...they were really happy. I also want my students to have this feeling in their PE lessons. (Sze Pre-lesson Interview 1, p. 7)

I copied some of the teaching methods from my past teachers...Past learning experiences were very important to me. (Ling Pre-lesson Interview 1, p. 13)

b) Plan Usage

The lesson plan preparation seemed to be an important part of teaching for the student teachers. The student teachers recognized the necessity of lesson preparation before they teach. However, both groups of subjects treated lesson planning differently when teaching. The pre-service students mentioned that they would discuss their planning with their friends, classmates and lecturers. They seemed to have no confidence in making preactive decisions. Moreover, they were more plan dependant and kept their plans with them when teaching. As Kei said, "I write a teaching plan first and I teach according to the plan" (Kei Pre-lesson Interview 1, p. 5). The relationship between preactive decision making and teaching in the classroom seemed linear. Their teachings were lesson plan driven.

Although the in-service student teachers had also the lesson plans prepared, they understood that they might need contingency actions during the real teaching

situation based on their past teaching experience. As Yung said, “My teaching will depend on the learning ability of the students. I will change the content accordingly” (Post-lesson Interview 2, p. 9).

Besides, the data of the field notes indicated that student teachers used different kinds of drills and game-like activities as their major learning activities in the game lessons. The main purpose of these learning activities was to help improve the skill techniques of the students. When they were asked about the main objectives of their games lessons, most of them admitted that they expected the students to capture the game skills at the end of the lessons. It is likely that their planning of the games lessons were rather technically oriented. Here were the examples of their stated lesson goals:

The students should capture the correct technique of the underhand dig and apply the technique to pass the ball once. (Ling Pre-lesson Interview 1, p. 14)

Students will be able to perform the technique of inside of the foot passing in 5-metre distance. (Kei Pre-lesson Interview 2, p. 1)

To perform the technique of volley pass. (Choi Pre-lesson Interview 2, p. 1)

Students can learn the skill of passing after straight line dribbling for 2-3 metres. (Chu Pre-lesson Interview 1, p. 11)

As mentioned previously, all the student teachers seemed to follow a similar lesson structure in planning their learning activities in games lessons. The learning activities provided in each lesson were in similar sequence and order. Data of the field notes indicated that the student teachers usually started with warm up activities and proceeded by skill learning and practice activities. Games application activities would follow and the lesson finished with a closing activity. One of the student

teachers described her planned practice as “students have to do warm-up first. I will divide the teaching contents into several parts and teach them in an orderly fashion. Students will apply the technique when they participate in the applied-skill activities afterwards.” There seemed to be a common pattern in the lesson structure of the class lessons.

Interactive Teaching Decision

Physical education teachers make interactive decisions when they implement planned teaching practices during classroom teaching. During classroom practice, the teacher usually uses structuring moves to elicit students’ responses. By monitoring the response cues and determining whether they match the performance criteria, the teacher emits reacting moves that offer feedback to the students. Within this teaching process, the teacher makes a number of decisions based on the responses of the students. Peterson and Clark (1978) state that interactive decision-making begins when the teacher initiates planned practice, monitors and evaluates the student and decides whether to continue the practice unchanged or make an “in-flight” adjustment. In the present study, the student teachers certainly made numerous decisions during their teaching. By analyzing the data collected in the post-lesson stimulated recall interviews and using the decision path analysis method, the investigator attempted to explore how the student teachers made decisions when teaching in ball games lessons.

The decision path analysis method required the student teachers to answer four specific questions in the stimulated recall interviews. Each reported decision can be

coded as a “yes” or “no” response. The combined responses fall into the five different interactive decision pathways options shown in Table 9.

Table 9
Responses Associated with Five Decision Paths during Interactive Teaching

Interactive Decisions	Decision Pathways				
	1	2	3	4	5
Cue in tolerance?	Yes	No	No	No	No
New routine necessary?	----	No	Yes	Yes	Yes
New routine available?	----	----	No	Yes	Yes
New routine initiated?	----	----	No	No	Yes

A description of both groups of student teachers’ interactive decision making is provided in Table 10. Pre-service and in-service student teachers reported a total of 51 and 56 interactive decisions in all observation lessons, respectively. Path 1 was the most frequent decision path, accounting for 29 (56.9%) and 44 (78.6%) of the decisions made by pre-service and in-service student teachers, respectively. This implies that both groups tended to teach as planned. The second most frequent decision path was Path 5 in which the pre-service group made 10 decisions and the in-service group made 7 decisions. This represented 19.6% and 12.5% of the decisions made by the pre-service and in-service student teachers, respectively. Path 5 illustrates an in-flight adjustment, where the student teachers actually initiate a new teaching practice during the lesson to bring student behaviours back to within tolerance. Path 2 decisions also occur in response to perceived problems, but changes in the lesson are not deemed necessary. Path 2 decisions were made 9 times (17.6%) by the pre-service student teachers and 5 times (8.9%) by in-service student teachers. Path 4 decisions were made 2 times (3.9%) by pre-service student teachers and not at all (0%) by in-service student teachers. This indicates situations

where problems are perceived and where alternative strategies are available, but changes are, nevertheless, not made. Finally, Path 3 decisions were chosen by pre-service and in-service student teachers once (2%) and not at all (0%), respectively. The data indicated that both groups of subjects tended to teach as planned in over 50% of the sample segments. When decision path 1 was not chosen, the groups differed in the decision they made. The in-service student teachers perceived things as going poorly but did not change their lesson (paths 2, 3 and 4) 8.9% of the time compared to 23.5% of the time by the pre-service student teachers.

Table 10
Number and Percentage Score for Interactive Decisions Taken by Student Teachers

Pathway	Pre-service	In-service
1	29 (56.9)	44 (78.6)
2	9 (17.6)	5 (8.9)
3	1 (2)	0 (0)
4	2 (3.9)	0 (0)
5	10 (19.6)	7 (12.5)

Answers to the post-lesson stimulated recall questions were also employed to investigate the antecedent thinking of the student teachers' reported interactive decisions. Two major thinking categories emerged as a result of the data analysis and re-analysis: a) students, and b) teacher. Student-related thinking was further categorized into four sub-themes: a) performance, b) compliance, c) safety, and d) enjoyment. This indicates antecedent thinking was mostly related to the performance of the students during the learning activities, the students' compliance within the tasks, the students' safety as well as the feelings of the students when learning. Teacher related thinking was further categorized into three sub-themes: a) instruction, b) management, and c) task. They are closely connected to the

instructional strategies, management strategies and the tasks presented in their lessons. Frequency scores were calculated for the antecedent thinking categories. In several cases, more than antecedent thinking was reported for a particular segment of a lesson. This is reflected in the interviews.

The antecedent thinking of the student teachers' reported interactive decisions are presented in Table 11. The in-service and pre-service student teachers' reported that interactive decisions were preceded by factors related to the teacher 54.8% and 81.1% of the time, respectively. Teacher instruction was reported most frequently by the pre-service students with 36.2% and by the in-service student teachers with 31.3%. Factors related to students were identified in 19% of the pre-service student teachers' antecedent thinking of interactive decisions and 45.3% of the in-service student teachers' antecedent thinking, respectively. The pre-service student teachers identified teacher management (41.7%) most frequently as the antecedent thinking decisions that altered lessons from the planned practice (Path 5 decisions), whereas the in-service student teachers identified teacher instruction (37.5%) and teacher management (37.5%) most frequently. It seemed that the pre-service student teachers tended to use information related to their management strategies to make interactive decisions, while the in-service student teachers tended to use information related to instructional strategies as well as management strategies.

The frequency of the interactive decision making revealed both groups of student teachers made in-flight decisions mostly related to their own teaching which either involved strategies in instruction or management. When inspecting Table 11 carefully, we can find that the in-service student teachers made more interactive

decisions related to the student's reactions in the lessons. They tended to use more information about student responses when making in-flight decisions. All student teachers appeared to be reluctant to improvise from their planned lessons. They seldom reorder, skip or change tasks. They made decisions based on their plan more than on the needs and interests of the students.

Table 11
Number and Percentage of Antecedent Thinking Decisions for Pathway Decisions as Reported by Pre-service and In-service Student Teachers

Reported by Pre-service and In-service Student Teachers						
Categories	1	2	3	4	5	Total
Students						
<u>Performance</u>						
In-service	18(36)	2(33.3)	0(0)	0(0)	1(12.5)	21(32.8)
Pre-service	3(9.4)	2(20)	0(0)	1(33.3)	1(8.3)	7(12.1)
<u>Compliance</u>						
In-service	2(4)	0(0)	0(0)	0(0)	0(0)	2(3.1)
Pre-service	1(3.1)	0(0)	0(0)	0(0)	0(0)	1(1.7)
<u>Safety</u>						
In-service	3(6)	0(0)	0(0)	0(0)	1(1.25)	4(6.3)
Pre-service	1(3.1)	0(0)	0(0)	0(0)	2(16.7)	3(5.2)
<u>Enjoyment</u>						
In-service	2(4)	0(0)	0(0)	0(0)	0(0)	2(3.1)
Pre-service	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Teacher						
<u>Instruction</u>						
In-service	15(3)	2(33.3)	0(0)	0(0)	3(37.5)	20(31.3)
Pre-service	16(50)	1(10)	0(0)	1(33.3)	3(25)	21(36.2)
<u>Management</u>						
In-service	8(16)	0(0)	0(0)	0(0)	3(37.5)	11(17.2)
Pre-service	8(25)	5(50)	1(100)	0(0)	5(41.7)	19(32.8)
<u>Task</u>						
In-service	2(4)	2(33.3)	0(0)	0(0)	0(0)	4(6.3)
Pre-service	3(9.4)	2(20)	0(0)	1(33.3)	1(8.3)	7(12.1)

Note: A total of 64 antecedent thinking decisions were reported by the in-service and pre-service student teachers, respectively.

Postactive Reflections

Training teachers to become reflective practitioners has become a major focus of many teacher education programmes (Goodman, 1991). As Dodds (1989) pointed out, continuous practice in making conscious choices about teaching and schooling and reflecting about the consequences of such choices provides teachers opportunities to become students of their own teaching, which is “the ultimate goal of effective teacher-training programs” (p. 101). Teacher educators thus encourage student teachers to make post-lesson reflections after their teaching during field experiences. There were no exceptions in the student teachers in the present study. The two groups of student teachers were advised by their institute supervisors to make postactive reflections during their teaching practice. Data of the post-lesson interviews indicated that there were some differences and commonalities of post-lesson reflections between the two groups of student teachers. Several categories emerged during the postactive stage of teaching: a) lesson objectives, b) lesson success, and c) future planning.

a) Lesson Objectives

The student teachers in the present study set skill development as the major lesson goals in their lessons. They claimed to evaluate their lessons by observing the skill performance of the students in the lesson. The in-service student teachers seemed to be happy and believed that they had accomplished the established lesson objectives. They stated that they achieved most of the lesson objectives:

I think I have achieved my lesson goal, but I was a little bit excited.
(Yung, Post-lesson Interview 1, p. 8)

Quite good, about 70% students could do the technique.

(Yung, Post-lesson Interview 2, p. 7)

I think so [achieved the lesson goal]. Most of them [students] could do the dribbling well.

(Chu, Post-lesson Interview 1, p. 12)

In contrast, the pre-service student teachers admitted that only half of their lesson objectives were achieved in the observed lessons. They attributed the failure to achieve the objectives to their ineffective teaching strategies, the students learning behaviours and the constraints of the school facilities and resources.

...most students did not capture the skills. Most of them were willing to practise but they couldn't grasp the skill at the end....I spent much time on managing the naughty students; routine training was insufficient; the playground was too small; resources were not enough; my explanation was not clear and my time control was not good.

(Sze, Post-lesson Interview 1, p. 12)

...students can't do the skills that I teach...Almost all are under my expectation except the students' behaviours.

(Kei, Post-lesson Interview 1, p. 9)

No. I don't think I can make it...The use of the playground and the lesson time. As my instructions were not clear, students sometimes didn't know what to do.

(Ling, Post-lesson Interview 2, p. 8)

b) Lesson Success

When the student teachers were asked about the success of the teaching, both groups were satisfied with their instructional performance. Aside from achieving the established lesson objectives, the student teachers focused mainly on student participation in the lesson as the criterion of success. They felt that getting students participating in the learning activities was their greatest success.

I was satisfied...They [the students] actively participated in the lesson and enjoyed the activities.

(Yung, Post-lesson Interview 2, p. 7)

It was acceptable and I was not disappointed...At least most of the students participated in the activities.

(Sze, Post-lesson Interview 1, p. 12)

I think I was successful in this lesson...They all actively participated in the learning activities. (Ling, Post-lesson Interview 1, p. 9 & 10)

c) Future Planning

The post-lesson reflections helped the student teachers to improve planning in future lessons. When they were asked whether they would change their teaching strategies and practices in future lesson planning, their responses were based on their experiences and teaching performance in the previous lessons. The in-service groups stated that they would also take students learning ability into consideration when planning future lessons. In response to student reaction in the previous lessons, some student teachers stated:

I will keep some teaching strategies...I will find some others to replace the existing ones [practising exercise]... I will change some [application tasks]. (Ling, Post-lesson Interview 1, p. 9)

I found that there were too many problems in this lesson... [I will keep] most of them [practising exercises], but not all of them. (Sze, Post-lesson Interview 1, p. 12)

The in-service student teachers would not give definite answers and they requested further information in planning their future lessons. They responded:

...because this teaching method is quite good, the students learn the skill step by step. But I will have different expectations for different classes...Many of them would be reused again...It will depend whether the students have learnt the skill before. (Yung, Post-lesson Interview 1, p. 8)

It depends on the progress of the students...It depends on the students' ability when learning. Maybe I will add more competitive games for them. (Chu, Post-lesson Interview 1, p. 13)

All in all, data from the present investigation of the planning, teaching, and post-lesson reflections of the two groups of student teachers revealed similarities and

differences in their thinking during stages of teaching. The similar student teachers' thinking was: they used whatever suitable resources to prepare lesson plans; their childhood school physical education experiences affected their lesson preparation; they designed similar patterns in lesson structure and learning activities in games lesson; they tended to teach as planned and were reluctant to improvise; the interactive decisions made were related to the student teachers' instruction and management strategies; they adopted skill development as the major objective in the lesson and used students participation as the criterion of their success in teaching; and they used their experience and performance in previous lessons for planning future lessons.

The different thinking features of the two groups were: autonomy in deciding the teaching contents of the lessons; the attitude of planning the lessons; the tolerance of perceiving things going poorly in class but did not change the lesson; the use of information about the student responses when making in-flight decisions; and the factors considered in planning future lessons. Since the two groups had different thinking characteristics when teaching and teachers' behaviours and decisions are believed to be guided by their personal beliefs, do they have different perceptions and beliefs about teaching physical education? This is one of the related issues that the investigator would like to look into in the coming section.

4.2.7 Did the two groups of student teachers have different beliefs and perceptions about physical education and teaching ball games lessons?

Doyle (1986a) argued that the act of teacher thinking involved selectively focused attention. A teacher's set of beliefs would indicate how they allocate attention during teaching. In this sense, having different beliefs about teaching affects how teachers practise in the classroom. Educators suggested that student teachers' beliefs about the purposes of physical education will probably influence the decisions about curriculum and instruction they make as teachers (Rovegno, 1993a; Weinstein, 1989). Therefore, it is necessary to examine what the student teachers in the present study believe about what it means to be a physical education teacher. As the quantitative data captured in the systematic observation instrument and the qualitative data gathered in the field notes observation in the present study revealed that there were some differences in teacher behaviours and teaching strategies employed between the two groups of student teachers, the two groups might possess different beliefs and perceptions of physical education and teaching. During the pre-lesson interviews, student teachers were asked about their beliefs about a) the purpose of physical education, b) effective teaching, c) roles of physical education teachers, and d) teaching in ball game lessons in order to understand their perception of teaching physical education. Several themes emerged from the student teachers' responses: a) the function of a physical education teacher, b) good teaching, and c) learning to teach.

a) Function of a Physical Education Teacher

The student teachers seemed to have common beliefs about what being a physical education teacher meant. They believed physical education teachers should help their students to gain physical education knowledge, capture sports skills and develop their interest in sports activities as well as understand how to cooperate with others. They considered these as the main roles of physical education teachers. Below were some of the responses of the student teachers on the roles of physical education teachers:

To make students have an interest in PE; to teach some basic sports skills to students and to let them learn how to co-operate with others through physical activities.
(Kei Pre-lesson Interview 1, p. 2)

I think a P.E. teacher should be just as what I previously said. But one point is very important: this is how to develop an interest in sports in students.
(Ling Pre-lesson Interview 1, p. 4)

To introduce different kinds of sports to students and to teach them sports skills. Also, we will provide some channels for students to take some PE courses outside school.
(Choi Pre-lesson Interview 1, p. 3)

To transfer knowledge, to enhance the students' interest in sports and help them to capture the sports skills and further their sports participation in daily life.
(Chu Pre-lesson Interview 1, p. 2)

Moreover, they believed the students would eventually gain multiple benefits from physical education lessons. The students would learn basic skills and knowledge of sports; they would like PE after PE lessons; they would learn how to cooperate with others; they would be more fit and healthy and develop positive lifestyles. Their beliefs of the purposes of physical education:

...students learn basic skills in sports...they will like PE after PE lessons. Moreover, through PE activities, students can play different kinds of sports and be healthy. By playing sports, students can learn the idea of teamwork and have a positive lifestyle.
(Kei Pre-lesson Interview 1, p. 2)

To introduce different kinds of sports to students, to train their fitness, and to teach them some PE knowledge. (Choi Pre-lesson Interview 1, p. 2)

Besides, both groups of student teachers admitted that they developed these basic beliefs either by the impact of their past school physical education experiences or the influence of the teacher education programme. The student teachers claimed that they established this perception “from IEd [teacher education programme]”, from their “previous primary and secondary school PE teachers” and “personal learning experiences”.

In order to achieve the above purposes and fulfill the roles of physical education teachers, the students believed that a physical education teacher should a) possess good subject knowledge, b) be able to perform different sports skills, c) understand their students, d) be enthusiastic and have a good attitude in teaching, and e) have sports participation and activities organizing experiences. The following were the characteristics of good physical education teachers as they described them:

should have a deep understanding of PE and sports... good communication skills with students, and understand how to treat special students and help them to join the sports activities... good voice in order to attract students during his teaching...has teaching experience or being an athlete and having experience in sports competitions... (Sze Pre-lesson Interview 1, p. 2)

should have abundant knowledge and skills in physical education...have experience in leading extra-curricular activities because most school PE teachers need to in-charge extra-curricular activities...is sincere and willing to teach...he will try to develop his career professionally and improve himself. (Ling Pre-lesson Interview 1, p. 4)

should have a clear concept about the beliefs of teaching...have enough PE knowledge and...have enthusiasm in teaching PE....good in many sports skills...have some sports playing experiences...[and]have more teaching experiences...should also know how to communicate with students. (Yung Pre-lesson Interview 1, p. 3)

b) Good Teaching

Providing good teaching to students is one of the major aims of physical education teachers. The student teachers in the present study appear to share similar views of good teaching by describing the major characteristics of a successful physical education lesson. Five major features of a successful lesson were: a) lessons well prepared, b) lesson goals achieved, c) involved student learning, d) students enjoyed and were happy in the lesson, and e) students actively participated in the lesson. The student teachers described a successful physical education lesson more than just having a “busy, happy, and good” orientation (Placek, 1983). They mentioned that the lesson ought to be well prepared. The students enjoyed the learning and learnt. The lesson objectives were achieved at the end. Below were some of their beliefs about successful teaching:

PE teachers have prepared their lessons well and students have learnt some skills in sports after the lessons...Students’ participation is very important. Moreover, students should find that they have learnt something after the lesson.

(Kei Pre-lesson Interview 1, p. 3 & 5)

Students should be happy and can learn something about PE... Students’ participating rate is high and teachers can achieve their planned goals. Lastly, students can have a happy and relaxed PE lesson.

(Sze Pre-lesson Interview 1, p. 3 & 5)

It should be well prepared. Teachers should achieve their planned goals and students should learn something in the PE lessons...

(Choi Pre-lesson Interview 1, p. 3)

Students can learn what you teach in the lessons...the lesson should achieve the teaching aims. Moreover, students should be given chances to practise the skills and their potential can be fully developed.(Chu Pre-lesson Interview 1, p. 5 & 9)

When the student teachers were further asked about the beliefs of teaching ball games lessons, the in-service student teachers thought that there was not much

difference between teaching ball games and teaching other sports activities. They only pointed out that they ought to teach in a larger area and use more resources. More accidents were likely to occur in this situation. The pre-service student teachers claimed that they preferred using the direct instruction approach in teaching ball games activities. They believed this approach was safer and more effective in teaching games activities. Here were the views of in-service student teachers on teaching ball games:

For ball games, the venue should be larger. I think ball games teaching is more dangerous. Students will easily get injured. But in the teaching methods and arrangement, their differences are not so obvious.

(Chu Pre-lesson Interview 1, p. 12)

More resources should be prepared and the playground should be larger for teaching ball games.

(Yung, Pre-lesson Interview 1, p. 10)

The following were the views of pre-service student teachers on teaching ball games activities:

For ball games, I can divide students into more small groups and teach them step by step...it is better to use the direct teaching method.

(Sze, Pre-lesson Interview 1, p. 8)

I think the main difference is the use of equipment in the lesson...I usually use the direct instruction method when teaching ball games, I will demonstrate the technique and ask the students to follow and practise.

(Ling, Pre-lesson Interview 1, p. 16)

Lastly, both groups of student teachers believed that a successful games lesson was similar to any other successful sports activity lesson as the lesson objective was achieved and students were happy in the lesson.

Students are not afraid of the ball after the lesson. Student can capture the skill technique and they are happy during the lesson.

(Choi, Pre-lesson Interview 1, p. 8)

Students should be happy and can learn something in PE lesson. Students should enjoy the lesson. Teacher can achieve her teaching goals.

(Sze, Pre-lesson Interview 1, p. 9)

c) Learning to Teach

Teaching practices are important events for student teachers. Student teachers develop much of their teaching skills during the teaching practice. There were no exceptions in the student teachers in the present study. The data of the post-lesson interviews revealed that they all treasured the experience of their teaching practice. They believed that they all learnt and understood more about their teaching during teaching practice. The teaching practice experience had offered them the opportunity to know their weakness in teaching and understand student learning. They also expressed that the teacher education programme, the institute supervisors, the cooperating teachers and school students all had played a part influencing their learning to teach. They maintained that the method modules within the teacher education programme were particularly useful to them. The comments and advice from the institute supervisors and cooperating teachers, the responses of the school students were all valuable information for reflection in order to improve future teaching. Here are the positive views of the student teachers on the effects of the teacher education programme and teaching practice:

I have an opportunity to apply what I learn from IEd. In the internship, I could learn and use some new teaching methods... We [I] learn the teaching skills and methods from the lecturers [teacher education programme].

(Ling, Post-lesson Interview 2, p. 9-10)

It helps me understand more about my weakness in teaching, and I can improve and correct them before going out to teach as a real PE teacher... She [PE teacher training] teaches us the basic teaching models and how to help students to learn.

(Kei, Post-lesson Interview 2, p. 8)

expected that they would learn and develop their learning to teach process.

The findings in the present study confirmed that teacher's knowledge of student teachers had exerted influence on their practice in ball games lessons. As the two groups of student teachers seemed to possess different subject matter knowledge, pedagogical knowledge and pedagogical content knowledge of teaching ball games activities, these differences might contribute to the differences in their teaching behaviours in ball games lessons. Then why did the two groups of student teachers possess different teachers' knowledge? The investigator would like to discuss this issue in next the chapter.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

This study sought to explore the teaching behaviours of pre-service and in-service primary physical education student teachers in ball games lessons. The goals were to describe and compare the pre-service and in-service primary physical education student teachers' teaching behaviours during their teaching practice as well as offering explanations for the differences and similarities in their teaching.

This chapter will discuss the major findings for each of the research questions. The chapter will share some perspectives on how the two groups of student teachers practiced in the teaching practise and will help our understanding of the differences and similarities in their teaching. This will be followed by a discussion of implications of the findings. The final section will present some recommendations for the teacher preparation programme as well as for future research in this area.

5.1 Teaching Behaviours of Student Teachers

Physical educators have realized that proper allocation of time spent in instructional and managerial behaviours will help student learning in physical education lessons. Curtner-Smith (1994) suggested that teachers who spent a relatively large proportion of lesson time in instruction and relatively less time in class management were more successful in terms of enhancing students' skill learning. Readers need to be cautioned that this causal relationship cannot be implied from correlational data, however, it is worth to note the intention of the researcher is to point out the significant influence of the teacher's teaching

behaviours on students' learning behaviours. Other physical educators also agreed if teachers could spend a minimum of time in managerial behaviour and make use of the time to provide short and explicit demonstrations with appropriate information, this would help students to have more time in skill practising and learning (Byra & Coulon, 1994; Silverman, 1991; Werner & Rink, 1989). Metzler (1989) after reviewing several research studies on sport pedagogy commented that most American physical educators spent a lot of time on non-instructional activities and allocated about 25 to 50% of their lesson time to management, passively observing and organizing. Relatively speaking, the student teachers in the present study demonstrated good teaching behaviours in terms of time spent on instructional and managerial behaviours. They allocated almost four fifths of their lesson time to instructional behaviours and only one fifth to managerial behaviours.

When comparing student teachers' behaviours with recent research using PETAI to investigate teacher behaviours (Aicinena, Steffen & Curtner-Smith, 1992; Curtner-Smith, Kerr & Hencken, 1995a; Lacon & Curtner-Smith, 1998; Laker, A, 1994; Smith, Kerr & Wang, 1993), the local sample in the present study spent relatively more lesson time in instructional behaviours and relatively less lesson time in managerial behaviours than all the other American and English physical education teachers (see Table 12). The percentage of time spent in both instructional and managerial behaviours by the local student teachers was very similar to the patterns of teaching behaviours of the American physical education teachers and British physical education student teachers.

However, the local student teachers spent rather less time in presenting their teaching materials. This might be due to the short lesson time in Hong Kong primary schools. The normal primary physical education lesson time in Hong Kong ranges from 30 to 35 minutes. In practice, the physical education teachers only have about 25 minutes to teach the lesson since they have to spend some time to bring the students to the playground as well as back to the classroom before the start of another subject lesson. It is unwise for them to have a long explanation and demonstration during the lesson. Short lesson time restricts them having detailed instructional behaviours. This is the major reason that Hong Kong physical education teachers usually adopt precise and concise presentation strategies. They reserved more time for other instructional purposes.

Table 12

Comparison of Teachers Behaviours with American and British Studies

	Percentage of Time in Instructional Behaviours	Percentage of Time in Managerial Behaviours
Aicinena, Steffen & Curtner-Smith (1992)	76.57 %	23.43 %
Smith, Kerr & Wang (1993)	70.89 %	29.11 %
Laker, A. (1994)	76.94%	23.06 %
Curtner-Smith, Kerr & Hencken (1995a)	72.15 %	27.85 %
Lacon & Curtner-Smith (1998)	72.16 %	27.84 %
Present Study	77.19 %	22.81%

Besides, the local student teachers also allocated relatively more time to response presentation and reasonable time to performance feedback. They tried their best to help the pupils enhance their skill learning. They kept repeating the teaching points and reminding the pupils as well as providing information in response to the skill performance of the students, which was always emphasized by the

supervisors in the teacher education institute. However, it was rather discouraging to know that they did not give much motivational feedback to their students. Motivational feedback is helpful to encourage student learning. The possible explanation for this is to their inadequate teaching experience as they are at the novice stage of teacher development according to the Berliner (1988a). The teachers were inflexible and labelled every task they had learnt from the teacher education institute. They might be too anxious about teaching during the lessons. They could only concentrate on contents presentation and neglected motivating individual students to learn. They might overlook the importance of giving motivational feedback. They paid too much attention to students' skill learning during the lesson. In fact, Ha (1996) also found similar results when she examined the teaching behaviours of 40 Hong Kong physical educators. The physical education teachers provided low rates of praise and little positive feedback when teaching physical education lessons.

Providing feedback to students is the major immediate task of school teachers. Educators after an overview of effective teaching studies indicated that providing regular feedback to students was among the most essential teaching practices of effective teaching (Brophy & Good, 1986; Rosenshine & Steven, 1986). Effective teachers usually allocate a large amount of time to helping students acquire skills by giving performance feedback, motivational feedback and response presentation (Phillips & Carlisle, 1983; Knop, 1986). It appeared that the local physical education student teachers spent considerable time in helping students to learn but gave less attention to the motivation of individual student learning.

Teachers usually spend some time observing student learning in class. Physical educators defined this kind of instructional behaviours as monitoring (Phillips, Carlisle, Steffen & Stroot, 1986). Evertson (1989) suggested the need for close monitoring of students in class because of the dynamic nature of the classroom situation. Kounin (1970) introduced the concept of “withitness” and “overlapping” in the area of teacher monitoring. Withitness was described as “a teacher’s communicating to the children by her actual behaviour... that she knows what the children are doing” (Kounin, 1979, p. 80). Overlapping was defined as the teacher being able to attend to two or more events in the classroom simultaneously. As physical education teachers are responsible for the learning taking place in class, they must ensure that the pupils are participating safely and according to the learning task. Mastering both “withitness” and “overlapping” skills in monitoring are essential and necessary for physical education teachers. Boggess, Griffey and Housner (1986) demonstrated that monitoring was a key tool used by physical education teachers in order to maintain class order.

It is assumed that the teachers are cognitively functioning to help the pupils while silently observing the learning environment. Recently Aicinena (2000) confirmed that the cognitive behaviours during this observing period was mostly concerned with the behaviour of students and performance when he studied a physical education student teacher’s thought during monitoring in twenty two classes. However, it was surprising to find that physical education teachers allocated as much as 57% of their lesson time in monitoring (Aicinena, Steffen & Curtner-Smith, 1992). Hastie (1994) showed that the less effective teachers spent more time observing.

Conversely, Behets (1997) demonstrated that more effective teachers spent significantly more time in observing during gymnastics activity time. He explained that this might be due to the content specific nature of the lessons. In the present study, the local sample on average spent 37.26% of lesson time in monitoring. Most monitoring occurred during game play or the practice of skills. As institute supervisors always encourage student teachers to allocate considerable time for skill application, the student teachers usually reserve over one third of the period time for game play or conditioned games. It is logical to find that the local student teachers had allocated almost 40 % of the lesson time to monitoring during games teaching.

It should be noted that the managerial time was commendably low. When comparing the managerial time of the present sample to the American and British physical educators, it is encouraging that the local student teachers also spent comparatively less time in class management. As Brophy (1982) pointed out, one of the characteristics of effective teachers was minimizing time spent on class management activities. Physical educators further demonstrated that helping teachers reduce management and student non-engagement time, in turn increasing motor appropriate responses to students, resulted in more students engaged in skill learning time (Landin, Hawkins & Wiegand, 1986). Most effective teachers would try to lessen time spent on nonacademic tasks, transitions between activities and dealing with disruptions. It seemed that the Hong Kong student teachers were doing a very good job in this regard.

5.2 Comparing Teaching Behaviours Between the Pre-service and the In-service Student Teachers

The in-service student teachers demonstrated that they were more effective than the pre-service group in terms of time spent in the lesson. They spent significantly more time in instructional behaviour and significantly less time in managerial behaviour than the pre-service student teachers.

Regarding instructional behaviours, the in-service group ($M=23.06\%$, $SD=6.64$) gave significantly more response presentation time than did the pre-service group ($M=10.32\%$, $SD=5.12$), $t(62)=-8.60$, $p<.05$ (two tailed tests). They emphasized giving teaching points and summarizing information relative to the skill learning activities. They gave more attention to student performance by giving more time to performance feedback than the pre-service group. Field notes data confirmed these in-service students' behaviours as they actively moved around and provided feedback to students. However, they did not exhibit positive feedback and allocated a low percentage of time to motivational feedback as did their pre-service counterparts. It was possible that the in-service student teachers were more concerned about individual student performance and moved into a more mature stage of teacher development. Having more in-field teaching experience seemed to be the only possible factor that helped the in-service group advance to this stage of development. As they have three to seven years teaching experience in physical education, according to Berliner (1988a), they might enter into the stage of advanced beginner and competence. Based on the classroom experience, the teachers were able to make conscious choices about their actions and be more flexible in teaching. They were more aware of student class performance. Instead of just presenting the skill

activities, they knew the importance of helping pupil learning by giving more skill related and student performance feedback.

Furthermore, the pre-service group ($M=14.01\%$, $SD=5.47$) spent significantly more time in planned presentation than their in-service counterparts ($M=11.28\%$, $SD=4.28$), $t(62)=2.09$, $p<.05$ (two tailed tests). This indicated that they spent more time in explaining and demonstrating their teaching contents than the in-service group. In fact, field notes data also captured these less effective teaching characteristics of pre-service student teachers. As there is limited time in primary school lessons, it is not advisable to allocate too much time to verbal information or demonstrations. Behets (1997) showed that the most effective teachers gave less instructional information and less time on demonstrations as well as their lessons being characterized by a lot of practice time. He demonstrated that good physical education teaching should be typified as “learning by doing”. The pre-service group was possibly not teaching as effectively as their in-service counterparts because they were talking a little more.

By observing the overall percentage of time spent in instructional behaviours, the in-service group ($M=83.28\%$, $SD=6.23$) spent more time than their the pre-service counterparts ($M=73.18\%$, $SD=9.14$), a statistically significant difference existed, $t(60.887)=-5.42$, $p<.05$ (two tailed tests). It was likely that the in-service student teachers could handle the class more wisely and allocate more time for instructional activities which in turn helped students learning in class.

In terms of class management, the in-service group seemed to have better class management skills than the pre-service sample as they spent less total managerial

time in class. The pre-service group ($M=26.82\%$, $SD=9.11$) spent significantly more time in managerial behaviours than the in-service sample ($M=16.72\%$, $SD=6.24$), $t(62)=4.99$, $p<.05$ (two tailed tests). Field notes data substantiated that the in-service student teachers had employed more effective management strategies and exhibited more skilful managerial behaviours. Physical educators agreed that effective teachers spent less time managing and more time instructing. Harrison (1987) pointed out that effective teachers minimized time spent on nonacademic tasks in order to increase academic learning time after reviewing studies of effective teaching in physical education. Siedentop, Herkowitz and Rink (1984) also claimed that a major goal of good teaching was to reduce managerial time. They pointed out that student teachers could develop into good class managers and spend no more than 10% in management time. Some student teachers could even keep their average class management time below 5%. Smith (1991) and Carlisle, Steffen and Phillips (1986) demonstrated that the management time of pre-service physical educators could be improved by employing intervention programmes. It seemed that most pre-service student teachers did not possess good class management skills at first. After listening to advice, practising reflection and gaining experience, they would improve their classroom management skills. In a study of 18 experienced physical educators, Phillips and Carlisle (1983) found the most effective teacher spent an average of 12.09% of class time in management, however, the least effective teacher allocated 43% of lesson time in management. Research results also indicated that primary school physical education teachers were ineffective in terms of time management and spent a large percentage of management time in class (Quarterman,

1977; Stewart, 1980). They found that primary physical educators on average allocated 37% of the lesson time to management and the least effective teacher even spent 52% of the lesson time to management in their studies. In the present study, in-service student teachers shared as low a percentage class management time as 16.72%. It seemed that they were managing the classes very well.

Teaching environments in physical education lessons are indeed dynamic and complex, they demand sophisticated classroom management from the teachers. Recently, Brophy (1999) further suggests that new methods of organization and management are required for the teachers to accommodate the expanding diversity of students and settings. Having more teaching experience would definitely put the in-service student teachers into a better position than the pre-service group when dealing with these new demands.

Besides, teaching experience has been viewed as a crucial element in the learning-to-teach process (Richardson, 1990). Clandinin and Connelly (1986) state that teachers gain practical knowledge through experience from the cyclic nature of schooling and classroom life. It is expected that the experienced in-service group in the present study has better knowledge in teaching physical education than their inexperienced pre-service counterparts do.

When inspecting managerial behaviours carefully, the in-service student teachers spent less time in equipment management ($M=7.63\%$, $SD=4.15$), organization ($M=8.82\%$, $SD=4.35$) and behaviour management ($M=0.15\%$, $SD=0.53$) than did the pre-service student teachers in these respective types of behaviours ($M=12.29\%$, $SD=7.03$), ($M=13.04\%$, $SD=6.25$), ($M=0.98\%$, $SD=1.53$). Statistically

significant differences were also observed in time spent between these managerial types of behaviours respectively, $t(61.997) = 3.32$, $p < .05$ (two tailed tests), $t(62) = 2.90$, $p < .05$ (two tailed tests), $t(52.826) = 3.15$, $p < .05$ (two tailed tests). It was likely that the in-service group was more efficient in handling equipment set up and distribution. They demonstrated active skills in organizing learning activities as well as managing students' behaviours. The analysis of qualitative data supported the proposition that the in-service student teachers possessed these management abilities. Wasting time in setting or handling equipment will minimize time spent in instructional behaviours. By gaining more in-field teaching experience the in-service student teachers would be more familiar to the instructional environments as they knew their students better and learned how to plan and handle the class more wisely. As Choi and Yung said, they understood the learning of students better after they had experience in teaching them. The in-service student teachers seemed to have more confidence in teaching after gaining in-field teaching experience.

Clark and Yinger (1987) reported that experienced teachers often had plans in their memory from previous teaching experience, while novice teachers might have plans that were not carefully thought out. Similarly, without much in-field experience, the pre-service student teachers in the present study might not plan their lessons thoroughly which would lead to them having problems in class teaching. This explained why the pre-service student teachers did not consider contextual factors when planning as they did not understand their teaching situations. Indeed, class planning and management are common problems of student teachers. Boggess, McBride and Griffey (1985) found that the planning aspects of teaching and the

development of discipline and management skills were two of the six main concerns of student teachers when they investigated undergraduates' concerns about teaching physical education. Similar findings were also obtained by Cruz and Chow (1999) when they studied the teaching concerns of Hong Kong primary physical education student teachers. The pre-service student teachers mentioned classroom discipline as their major teaching concern. Stimulated recall interview data revealed that the student teachers in the present study were also very concerned about class management matters during interactive teaching. This outcome is congruent with Fuller's model of teacher concerns (Fuller, 1970; Fuller & Bown, 1975; Fuller, Parsons, & Watkin, 1973) and corroborates information from studies regarding physical education student teachers placing priority on management and class control (Arrighi & Young, 1987; Placek & Dodds, 1988; Schempp, 1988).

Fernandez-Balboa (1991) showed that pre-service physical education teachers lack the experience needed to predict what would happen during lesson implementation and that they often planned without giving enough consideration to organization of students and equipment. Mawer (1995) pointed out that inexperienced teachers often underestimated the time it would take to complete a lesson component. Inexperienced pre-service student teachers might need extra time for handling equipment and organizing class activities. As the pre-service student group in the present study had less teaching experience than the in-service group, it was not surprising to find that they used much more time organizing learning activities when compared to their in-service counterparts. Mawer (1996) reported that pre-service student teachers mentioned class control, class and

equipment organization frequently as teaching difficulties in physical education lessons. Teaching behaviours displayed by the pre-service student teachers in the present study also confirmed this notion. It is likely that pre-service student teachers need some time to learn how to handle these classroom management problems. In short, the in-service student teachers in the present study might be better lesson planners and class managers when compared to the pre-service student teachers.

5.3 Teaching Experience and Reflection

The in-service group indeed had more opportunities to refine their teaching than did their pre-service counterparts. They had more chances to consult their colleagues' comments and more chances to share ideas for improving their classroom teaching performance in school. They received more teaching supervision advice from their institute supervisors during the past years as they were visited by the supervisors every year. Besides, they reflected that they benefited a great deal from the advice and comments of the institute supervisors. For teacher development, the in-service student teachers were usually asked and encouraged to make reflective practices after teaching. Educators have identified that teaching experience is educative only with reflection (Shulman, 1986; Anning, 1988). Teachers will improve their teaching practice as a result of their teaching experiences and reflection on those experiences. Cater and her associates (1987) also agreed and acknowledged the role of reflected-on experience in the development of teaching expertise.

In the field of physical education, Curtner-Smith (1996) and O'Sullivan and Tsangaridou (1992) found that pre-service teachers taught more effectively if they had the opportunity to reflect on their physical education teaching. Indeed, reflective practice is essential for teacher growth and development. Training student teachers to be reflective practitioners has been a major focus of teacher preparation programmes (Graham, 1991; Kirk, 1986). Biggs and Moore (1993) suggested that student teachers would benefit if they were allowed time for reflection and absorption of their teaching experience. As Dodds (1989) pointed out,

Continuous practice in making conscious choices about teaching and in reflecting about consequences of such choices enriches the impact of field experiences and gives trainees enhanced opportunities to become students of their own teaching—the ultimate goal of effective teacher-training programs.

(Dodds, 1989, p.101)

Since the in-service group had more opportunities for reflection on their teaching performances, it was reasonable they would refine and improve their teaching skills. Teaching experience, reflective practice and constructive teaching supervision advice seemed to enhance in-service student teachers' teaching performance in the present study.

Nevertheless, it is unwise to conclude that teaching experience and opportunities in reflective practice are the only factors that contribute to differences in teaching behaviours between the in-service and pre-service student teachers in ball games lessons. Other factors such as beliefs and perceptions about teaching, teachers' knowledge and the decision making process during lessons might also contribute to

the outcomes of the teaching differences. These factors will be examined in the coming paragraphs.

5.4 Beliefs and Perceptions of the Two Groups of Student Teachers

Pre-service student teachers are thought to formulate a belief system about teaching while receiving childhood education. Lortie (1975) described this as an “apprenticeship of observation”. This apprenticeship influences their conceptualization about effective teaching, student learning and teaching contents. Schempp (1989) applied Lortie’s model to physical education student teachers and he found that the experiences that prospective teachers recalled from childhood education had a continuing influence over the pedagogical practices and orientations of their teaching in physical education. He also found that there was not as strong an identification with this by physical education teachers as Lortie had found with teachers in general. He supposed this was due to shorter contact time. It seemed the apprenticeship influence in physical education might not be so strong and therefore the opportunity for teacher education to have a greater impact, given a more informed perspective, would be possible. The results in the present study appeared to substantiate Schempp’s findings.

Both groups of student teachers held common beliefs about the roles of physical education teachers and the purposes of physical education. Both groups appreciated and valued school physical education. There was unanimous agreement among the student teachers that physical education was an important subject in the school curriculum. They believed that school children would gain multiple benefits when

participating in physical education lessons. Besides, they also shared similar criteria of successful teaching. It was most probable that they learnt these basic principles of physical education and beliefs about teaching physical education from the teacher education programme. Indeed, the student teachers admitted that they developed these teaching beliefs and perceptions about physical education as a result of the influence of their childhood physical education experiences as well as the training of the teacher education programme. The in-service group mentioned that they were not happy with the way physical education was taught to them and would, therefore, like to teach it in a more purposeful manner, while the pre-service group indicated that their teaching was much influenced by their childhood physical education teachers. They would copy or consider those teaching strategies when planning and teaching during their teaching practice as they had pleasant feelings and positive experiences during their childhood physical education. As Dewar (1984) and Steen (1985) found, most students were expecting to reproduce the same types of experiences that they themselves had enjoyed when they were students. It was not surprising that the pre-service student teachers in the present study also wanted their students to share the positive feelings they had had in childhood. On the whole, it was possible that the teacher education institute's messages were perceived as reinforcing student teachers' own beliefs and operated on overt teaching behaviours. Nevertheless, the findings in the present study indicated that both the childhood physical education experience and teacher education had influenced the beliefs of the student teachers in teaching physical education.

Teaching practice or field experience represents a step between the formal teacher training programme and the reality of teaching. In all instances, teaching practices provide opportunities for student teachers to experience an “actual teaching setting”. Many physical educators suggest that student teaching is the most important part of student teachers’ training (Dodds, 1985, 1989; Mitchell & Schwager, 1993; Schempp, 1989) as it helps the student teachers to develop their values, beliefs and teaching skills during this experience. The student teachers also agreed and rated the student teaching experience as the most significant and useful aspect of professional preparation (Chepyator-Thomson & Liu, 2000; Geddis & Roberts, 1996; Zeichner, 1980). The student teachers in the present study also shared the same view and highly valued their experience during teaching practice. They expressed that they had learnt more about students’ learning and understood their own weaknesses in teaching despite experiencing some frustration during this period. They developed class management skills and experienced all aspects of teaching in the real world. They became aware of their own weaknesses, the reality of physical education in schools and consolidated their view of physical education teaching. It seemed the more in-field experience they had, the more they gained in learning to teach. It is corroborated in the literature that student teaching is critical to teacher development and to induction into the teaching work force.

Besides, the student teachers also pointed out that different participants within the teacher education programmes had contributed to their professional development. These reflections substantiated the importance of the institute supervisors, cooperating teachers and school students in affecting student teachers’ learning to

teach during teaching practice (Friebus, 1977; Graber, 1995; Templin, 1981; Tinning & Siedentop, 1985). As effective teaching develops gradually and must be nurtured by all participants involved in the teaching practice, it seems that teacher educators need to re-consider the roles of these participants when helping student teachers to learn during this period. Nevertheless, the findings of the present study demonstrated that the two groups of student teachers held similar education beliefs and perceptions about physical education. Their educational beliefs and perceptions were closely related to their practice in teaching. For example, the student teachers would design specific learning activities and adopt appropriate teaching strategies to help students gain games skills as they believed games skills development was the major objective of physical education lessons. They also employed the teacher-directed approach to control the learning of the students as they believed this method was a safe and effective way to maximize the students' participation as well as minimize the chance of students getting injured. This is consistent with the findings of some studies that teachers' beliefs affect teachers' teaching behaviours (Ennis, Ross & Chen, 1992; Johnson, 1992; Rupley & Logan, 1984; Wing, 1989). These findings explained why the two groups exhibited similar teaching behaviours during their teaching. As decision making processes and teachers' knowledge might also exert influence on the teaching of the student teachers, differences in the above two factors might supplement why different teaching behaviours were exhibited by the two groups.

5.5 Thought Process and Decision Making

Mosston and Ashworth (1994) describe teaching behaviour as a chain of decision making. In fact, teachers need to make many decisions during different stages of teaching. Jackson (1968) describes teacher decision making as preactive, interactive and postactive, that is, taking place before, during and after teaching. Studies in comparisons of experts and novice teachers have shown that they differ in their thinking and decision making (Berliner, 1985; Carter et al., 1988; Griffey & Housner, 1991; Housner & Griffey, 1985; Sherman, 1983). It seems that more teaching experience will make a difference to thinking and making decisions when teaching. As the in-service student teachers had more in-field teaching experience than the pre-service group in the present study, it was likely there would be differences in the thought and decision processes between the two groups.

Findings in the present study revealed that there were both similarities and differences in decision making between the two groups of student teachers during different stages of teaching. Graham, Hopple, Manross and Sitzman (1993) showed that student teachers were having problems in preparing their teaching lessons and mainly relied on books, classes and written resources to plan. They all had a written plan before they taught. Both groups of student teachers in the present study shared these common planning characteristics. They used reference books, lectures notes and coaching materials to help their planning. They even consulted lecturers, senior teachers and friends for advice. This was in fact one of the common practices of student teachers when planning teaching lessons that could also be found in other studies (Rovegno, 1992c). It seemed that they did not have much confidence or

knowledge about preparing their lessons. Interestingly, both groups designed a similar style of learning activities in their lessons. They employed drill activities with partners and game-like activities in group settings (Housner & Griffey, 1985). In fact, this planning was reasonable as they adopted a similar teaching approach (direct instruction) and set similar lesson objectives (skill development). However, in-service groups showed more concern and considered more contextual factors when planning. They also took their past teaching experience and students' abilities into consideration. They seemed to make use of more information and focused much more on managing activities during instruction, while the pre-service group did not mention these factors and admitted they had difficulties in planning the lessons. It is possible that the more experienced in-service student teachers were more familiar with the real teaching situation. They understood that they had to make judgments and decisions in an uncertain complex environment. They possessed more information in order to anticipate possible situations that could arise when teaching. In contrast, the inexperienced pre-service group was relatively new to their classroom context, it seemed logical that they could only focus on teaching contents when planning.

Furthermore, the in-service group seemed to be more flexible in their teaching when compared to the pre-service group as they considered the students' abilities and responses when planning. It was likely that they might prepare more contingency actions for teaching, while the pre-service group was more plans dependent and would teach according to their planning. The planning behaviours of the two groups indicated that the in-service group appeared to have advanced into more mature

stages of the skill development model (Berliner, 1988a), advanced beginner and competent performer. The pre-service group seemed to be still in the novice stage. Using the language of cognitive science as an explanation, the in-service group had comparatively more information-rich schemas that allowed them to represent the complexities of the classroom in a meaningful way. Having more schemas of concepts in memory and more relations among concepts means a greater capability for retrieving related concepts (Rumelhart & Norman, 1985). As they had a larger number of contingencies stored in their memory, they would be able to anticipate and handle possible situations that might arise during teaching. Calderhead (1981) also agreed as he found experienced teachers had a sophisticated knowledge of schools, students and teaching that enabled them to increase the predictability of classroom instruction, while as the pre-service group possessed less well-elaborated schema, they could not recognize problems when planning. As Berliner (1988b) suggested, novice teachers form mental presentations of the lessons that are too narrow or incorrect during planning and therefore lead to problems during teaching. This explained why the pre-service student teachers in the present study had problems in teaching since their planning was not well developed.

During interactive teaching, the in-service group tended to teach to the plan more frequently than the pre-service group when lessons were proceeding as planned. They were reluctant to improvise from the planned lessons. This finding is consistent with other studies in physical education (Sherman, 1983), where experienced teachers tended to teach to the script more than did the less experienced teachers when lessons were proceeding as planned. As the in-service student

teachers had more experience in teaching, they entered the classroom with strategies that had kept student responses within tolerable limits on previous occasions.

Students taught by the in-service group should also respond appropriately more often than those taught by their pre-service counterparts as the former were more used to the teaching of the experienced in-service teachers. It was also possible that the pre-service student teachers had ambiguous schema for evaluating student responses and were prone to report more intolerable cues.

When lessons were perceived as not progressing as planned, the in-service group tended to implement a new teaching routine to resolve the perceived problems. In contrast, the pre-service group tended to teach without deviating from their planned lessons. It is possible that the pre-service group had no alternative plan in mind. This result suggested that the pre-service group had fewer alternative teaching strategies in their memory to draw from to make in-flight adjustments as they had less in-field teaching experience. The differences identified in the interactive decision-making tendencies between the two groups of student teachers parallel the findings reported by other physical educators (Byra & Sherman, 1993). They found that less experienced pre-service student teachers tend to stay with their plans, even when students' behaviours were perceived to be problematic but not serious.

Both groups of student teachers changed their teaching routines when alternatives were necessary and available. The pre-service group altered the lessons more than the in-service group did. This might be due to differences in their problem tolerance and perception. As the pre-service group was not familiar with the teaching situation, they might perceive more errors than actually occurred. They

might also be more intolerant and sensitive to unexpected events arising in the lessons.

Teacher instruction and teacher management were identified as antecedents most often in the in-service group's reported decisions to change their behaviours, whereas teacher management was identified most often in the pre-service group's reported decisions to change their behaviours. This suggested that the two groups slightly differed in their perception of lesson events. It seemed that this difference might be attributed to the differences of schema development. Educators suggested that expert and novice teachers differed in how they perceived and interpreted classroom events (Berliner, 1986; Calderhead, 1981). The expert teachers were thought to possess comparatively richer schemata for meaningfully interpreting classroom events (Carter, Cushing, Saber, Stein & Berliner, 1988; Cater, Saber, Cushing, Pinnegar & Berliner, 1987). The in-service group in the present study having more experience might have developed slightly better elaborated schemas than did the inexperienced pre-service group which allowed them to monitor classroom situations, recognize problems and make decisions that solve the problems. Pre-service student groups, by contrast, might perceive many situations as intolerable and thus find it necessary to respond to them. The inability of pre-service student teachers to assess a problem situation accurately and plan optimal problem solutions matches accounts detailing their frequent decisions related to class management matters. Veenman (1984) examined beginning teachers' perceptions of problems in teaching from a cognitive developmental perspective and pointed out that teachers at different developmental stages perceived and processed classroom problems differently. The

experienced teachers would effectively use information from a wide variety of sources when they interpret classroom situations. As the two groups of student teachers seemed to be in different stages of teacher development, this explained why the inexperienced pre-service group focused on classroom management matters and the experienced in-service group could consider both instruction and management issues when they altered the routines.

Student teachers were encouraged to conduct post-lesson reflections as this might enhance their decision-making power and autonomy (Calderhead, 1989). The student teachers in the present study were also advised by their institute supervisors to make postactive reflections. Findings revealed that they adopted games skill learning and students' participation as their major foci of teaching evaluation. This was reasonable as these foci related to their beliefs about teaching physical education and games activities. Besides, the student teachers also stressed that their reflections were mainly concentrated with the students' responses and their teaching performances in past lessons. It seemed that the two groups of student teachers made postactive decisions in a similar manner. However, the in-service group requested more information about students who were about to be taught when planning future lessons. These responses were consistent with the findings from previous research (Byra & Sherman, 1993; Housner & Griffey, 1985), where the experienced teachers requested more information than the inexperienced teachers when planning. This suggested the in-service group understood more than the pre-service group about what needed to be known to develop an effective lesson. They knew that the responses of the previous class could be dramatically different

from the next. They could only rely on the experience of teaching different classes to know what would make them succeed with a given class. In fact, this repertoire of tasks and activities has been tested over the years with many classes (Borko & Livingston, 1989). Their teaching experience appears to help their decision making.

Obviously, differences and similarities of thinking and decision making processes between the two groups of student teachers were closely related to the differences and similarities in their teaching behaviours exhibited when teaching ball games activities. Westerman (1991) identified that the thinking of novice teachers was qualitatively different from the thinking of experts. She further suggested that the major developmental difference between expert and novice teachers was the way they used pedagogical and content knowledge. It seems that teachers' knowledge also played a part in influencing teachers' teaching behaviours.

5.6 Teachers' Knowledge

Shulman (1987) has identified content knowledge, pedagogical knowledge and pedagogical content knowledge as essential elements of the prototype of expert teaching. Findings in the present study revealed that there were differences between these teachers' knowledge and the two groups of student teachers.

Cater, Carre and Bennett (1993) suggested that teacher thinking and subject knowledge were important ingredients in a teacher education programme for improving teaching. It is generally expected that student teachers must develop sufficient subject matter knowledge before they graduate. However, physical educators showed that student teachers might have problems in developing subject

matter knowledge (Capel & Katene, 2000; Laker & Jones, 1998). Student teachers in the present study also were aware that their subject matter knowledge was not well developed for teaching. Some admitted that the game activity they taught was not covered in the teacher education programme. They were not familiar with the teaching contents and had no confidence in giving demonstrations and feedback when teaching. Indeed, the duration of the teacher education programmes and physical education training received were comparatively shorter and fewer when compared to those taking the four year Bachelor of Education Degree programme. The pre-service student teachers in the present study were taking the two-year full-time Certificate Teacher Education Programme and the in-service groups were pursuing the three-year part-time Teacher Training Programme. The short duration of the teacher education programme might be the major reason why their subject matter knowledge was not well developed in the study. This situation can also be found in Britain where physical educators studied the development of the subject matter knowledge of physical education student teachers taking the one-year PGCE course (Capel & Katene, 2000; Hardy, 1996). Due to the short training programme, the student teachers were found lacking knowledge in areas of activity in the National Curriculum for Physical Education. They felt vulnerable when planning for the range of National Curriculum for Physical Education activities as less time was spent on practical activities in the PGCE year and student's degree courses. Besides, due to the nature of the teaching contents in physical education which cover a wide range of sports activity, some areas might be less valued and thus less prepared by the student teachers. This is another possible reason why some student teachers lack

knowledge in some sports activities areas.

Moreover, the pre-service student teachers seemed to possess less subject matter knowledge than the in-service group as they had more problems in planning the games lessons and displayed less supporting behaviours when teaching. Differences in subject knowledge might impact on the teaching of the subject. DfEE (1998) suggested that secure knowledge and understanding enabled student teachers to teach their subject confidently and accurately and was of major significance in initial teacher education courses. The student teachers were more likely to plan lessons appropriate for the students. Feedback to students is more likely to be specific and corrective as well as positive and supportive. Classroom and behaviour management would be effective if subject knowledge was secure.

Rovegno (1992a) argued that even when content knowledge acquired from the perspective of a learner/athlete was strong, this knowledge was not differentiated enough in terms of teaching and how children learn and did not support generating appropriate feedback. This explained why Kei with a strong football experience background still had difficulties in developing his lessons. Kennedy (1991) found that majoring in an academic subject did not guarantee that teachers had the kind of subject knowledge that they needed for teaching. Clarridge (1990) demonstrated that teachers with a lack of pedagogical skills were lacking in abilities that were important for effective teaching. Despite having a high degree of content knowledge, these teachers failed in their delivery of subject matter content to their students.

The investigator suspected all in-service student teachers in the present study initially did not develop sufficient subject matter knowledge, however, by having more in-field teaching experience, they learnt and understood how the students learnt. This helped them in planning and teaching. That is why some in-service student teachers admitted that they did not demonstrate the skills well enough but they had no problem in planning and helping students to learn in the lessons.

It is assumed that student teachers learnt their pedagogical knowledge mainly from their teacher education programme (Zeichner & Gore, 1990). Physical educators indicated that the teacher education programme had exerted influence on the student teachers' beliefs and practice in their physical education lessons (Ashy & Humphries, 2000; Curtner-Smith, 1998; Woods & Earls, 1995). However, others also found that student teachers' teaching practice was based on personal experience and observations of other teachers rather than knowledge acquired in university course work (Calderhead & Miller, 1986). Findings in the present study revealed that the student teachers learnt their teaching from both their teacher education training and personal experience. Nevertheless, the in-service groups demonstrated that they appeared to possess better pedagogical knowledge than the pre-service groups as they exhibited more effective and efficient pedagogical behaviours in teaching. As both groups received the same methodology course training and their experience in ball games was not much different, the only possible explanation for the differences in their teaching was that they differed in teaching experience in physical education. The in-service student teachers had more opportunities to apply the teaching theories and principles learnt from the institute as they had to teach in

school every day. They might have developed their pedagogical knowledge through these additional field experiences. As Grossman and Richert (1988) suggested, coursework gave student teachers an image of what was possible in field settings; what the in-service student teachers in the present study learnt in coursework helped them know what to look for in additional field experiences and the meaning of what they were seeing in terms of larger educational goals and issues. It is possible that the in-service group learned to “see the big picture” through field experience teaching (Yinger, 1987). As Rovegno (1993b) concluded in her study, coursework gave student teachers a broader context for interpreting field experiences and served as catalyst for the power of learning through learning, whereas learning through doing substantiated and integrated theory learned at the teacher education programmes.

Indeed, studies have shown that student teachers improved their teaching if they had the opportunity to translate their learnt knowledge into action (Ashy & Humphries, 2000; Curtner-Smith, 1996; O’Sullivan & Tsangaridou, 1992). While the pre-service group had limited teaching opportunities, they had few chances to apply these learnt theories. Some of them even might have had problems with management and so did not teach in the way they wanted to teach. This might explain why the in-service group in the present study appeared to possess better pedagogical knowledge than the pre-service group.

Pedagogical content knowledge appears to be important for effective teaching (Shulman, 1986, 1987, 1988). Educators demonstrated that this type of professional knowledge was closely related to effective instructional practice (Gudmundsdottir, 1987b; Smith & Neale, 1989). Findings in the present study revealed that the

in-service student teachers seemed to possess slightly better pedagogical content knowledge than their pre-service counterparts. As educators suggested that field experiences could facilitate the growth of pedagogical content knowledge (Grossman & Richert, 1988), it might offer an explanation why the in-service group seemed to possess better pedagogical content knowledge as they had more in-field teaching experience. As Kei had strong football experience background but still found difficulties in planning his lessons and employing organizational strategy in changing the application activities, it seemed that subject matter knowledge as a necessary but not sufficient condition for the development of pedagogical content knowledge. On the other hand, without much difference of subject matter knowledge to the pre-service student teachers, the in-service student teachers demonstrated that they seemed to possess slightly better pedagogical content knowledge as they chose more appropriate learning tasks for the students and employing more skilful organization strategy in handling the application activities transition. Moreover, researchers also indicated that inexperienced teachers had incomplete and superficial levels of pedagogical content knowledge (Carpenter, Fennema, Peterson & Carey, 1988; Feiman-Nemser & Parker, 1990; Gudmundsdottir & Shulman, 1987) and pedagogical content knowledge ought to be developed within the field environment (Rovegno, 1992a) and become embedded in the practice of teaching (Sehren, 1995). Therefore, the pre-service teachers in the present study might possess inadequate pedagogical content knowledge from field experiences as they had limited experience in teaching. On the other hand, the in-service group might learn to understand and teach content in relation to students' learning as they accumulated their teaching experience. Over

the years, teaching and observing the students in their classes might facilitate the development of pedagogical content knowledge. This is similar to Elbaz's (1983) contention that teacher's practical knowledge both shaped, and was shaped by, practice. It is likely that teaching experience is closely associated with the development of pedagogical content knowledge.

All in all, the in-service group appeared to possess better pedagogical content knowledge than did the pre-service group as they had more in-field teaching experience. The differences in teachers' knowledge between the two groups of student teachers might lead them to exhibit different teaching behaviours during the teaching practice.

Nevertheless, it is unwise to conclude that teaching experience, teachers' thinking and decision process, and teachers' knowledge are the only factors that contribute to the differences in the teaching behaviours between the two groups of student teachers in ball games lessons. Other factors such as the sociocultural influence of teachers' teaching, teaching context, and students' characteristics might also attribute to the outcomes of the teaching differences. However, these variables are beyond the study of this investigation. The study of these factors may provide a direction for future investigation.

5.7 Implications of the Analysis

The findings from this study held several implications for the preparation of physical education teachers. The quantitative data in the present study revealed that both the pre-service and in-service student teachers did not give much motivational

feedback, while the qualitative data indicated that the pre-service student teachers provided less supporting behaviours to students. This has implications for practice in physical education teacher education. The information would help the teacher educators when teaching the methodology courses to remind student teachers to give more positive feedback and supply active supporting behaviours. Moreover, there is still room for the pre-service student teachers to improve their classroom management time. It seems that the pre-service student teachers lack of pedagogical skills relates to the classroom management. Field notes data showed that the pre-service student teachers were particularly weak in organizing learning activities and handling equipment when teaching. Development of these teaching abilities should be emphasized within the pre-service teacher education programme in future.

Field notes data also revealed that the pre-service student teachers had problems in choosing appropriate learning tasks and skill-applied games in games lessons. The development of competence of student teachers in games teaching and planning should receive much attention in physical education teacher education programmes.

Data generated also support the findings that in-service student teachers have a better teaching performance than their pre-service counterparts. This implies that teaching experience is vital for the development of effective teaching. These results are congruent with other research findings. Teachers' experience did influence how teachers behave in a classroom, such as their communication skills and higher level of flexibility (Stroot & Morton, 1989), presentation skills (Griffey & Housner, 1991; Westerman, 1991), class disciplining (Saber, Cushing & Berliner, 1991; Tam, 1997), and managing change (Westerman, 1991).

Graham (1990) maintains that there is no substitute for spending time with real children, in real schools and with real teachers. Other educators even point out that improved classroom practicum experience accelerated novice teachers' growth toward expert pedagogy (McDermott, Gormley, Rothenberg & Hammer., 1995). Thus, teacher educators in Hong Kong should revise the pre-service student physical education training programmes and extend their opportunities and experience in teaching physical education. In addition to organizing more peer teaching trials, the time duration and frequency of the teaching practicum should also be increased. Providing more chance of practice teaching may help to shorten the student teachers' journey from novice to a competent level.

However, the investigator in the present study has no intention to favour the adoption of the apprenticeship style "training" of the student teachers and neglect the "education" of the student teachers. I understand the improvement of classroom practicum experience will help to master a repertoire of teaching skills but it does not guarantee the student teachers will be able to make proper judgment about what ought to be done in a particular situation. The apprenticeship model of teacher training seems to be inadequate for preparing student teachers to teach in the complex unstable world of practice.

Nevertheless, with the increase of the classroom practicum experience I believe the student teachers will be benefited by having more opportunities in reflecting about their teaching practice. By active reflection process, the student teachers may construct their knowledge of teaching. As Rovegno (1992b) argues that the learning to teach process requires pre-service teachers to actively perceive and teach that

content.

Educators also point out that some of the teaching knowledge is needed to be learnt in situ. Feiman-Nemser and Parker (1990) claim, “teachers deal with particular content and particular students in particular settings, all that pre-service teachers need help ‘figuring out’ how to engage students in learning worthwhile content” (p. 42). It seems that the situated learning theories in physical education suggested by Kirk and Macdonald (1998) recently best describe the nature of learning of physical education student teachers during their teaching practice. The learning of the student teachers takes place in particular sets of circumstances, in time and space and it may also involve interaction between individual student teachers and others within this social settings. The learning of the student teachers is an active process involving individuals in interaction with their physical environment and with other learners. This opens up new research issue for the field of physical education teacher education.

The findings in the present study also show that the teaching performance of the pre-service and in-service student teachers is different, the teacher educators should re-think the nature of their graduates. They should consider the different needs and concerns of the pre-service and in-service student teachers in their teaching practicum. More appropriate advice could be given during their teaching supervision.

Moreover, there is no justification for saying “more instructional time must be better”, educators proved that allocating more instructional time did not equal more learning. The quality of time and instruction are more important than the “quantity”. Karweit (1988) demonstrated that spending more time on academic activities could

have adverse results if the instruction or resources are inappropriate. On the other hand, the students are also responsible for their learning outcomes. Some of them may be off-task even when they are engaged in academic activities. Effective teachers would try to minimize waste time in an effort to maximize time-on-task and student engagement (Wyne & Stuck, 1982). Good and Brophy (2000) further indicate that time-on-task instructional time should be allocated in relation to the importance of the academic task. It is likely “more” does not guarantee good in this respect.

It is encouraging to know that the development of education beliefs and the capturing of the basic teaching techniques of student teachers in the present study were partly influenced and learnt from the teacher education programme. With clear and strong consistent programmatic messages, the teacher education programme can exert an impact on student teachers in acquiring pedagogical principles and developing education beliefs. Therefore, multiple methods modules should be required in the teacher preparation curriculum. These modules should include the topics of management routines, subject matter content and teaching techniques and involve a practical element which allows the student teachers to have opportunities to apply their learnt theories.

Moreover, the student teachers also commented that different participants within the teaching practice had contributed and assisted them in learning to teach. Thus, physical education teacher educators should re-consider these roles and identify the responsibilities of these participants explicitly. Helping the participants better understand their duties and promoting teamwork among them would make the

student teaching experience more positive and effective for the student teachers.

Lastly, the findings of the present study indicated that teachers' knowledge influenced the practices of their teaching. The student teachers might not develop sufficient teachers' knowledge for their teaching practice (Graber, 1998). This holds implications for the physical education teacher educators to ensure their students are equipped with basic subject matter knowledge, pedagogical knowledge and pedagogical content knowledge before they teach. Providing coaching courses and extended programmes in the evenings and at weekends might help student teachers to gain subject matter knowledge, while the teacher educators might need to make the pedagogical knowledge and pedagogical content knowledge more explicit to student teachers during the methods course. By discussing the relation between contents, how students learn contents as well as how to teach and observe those contents might help student teachers develop pedagogical knowledge and pedagogical content knowledge.

As teaching is a complex dynamic activity occurring in a complex environment (Doyle, 1986a; Shulman, 1987), combining quantitative and qualitative data together could give a better account of the teaching behaviours of the student teachers. The findings from these data did provide some information on the teaching behaviours of student teachers in primary physical education and helped us understand how student teachers teach ball games activities during their teaching practice.

5.8 Conclusions

The following conclusions are based on the analysis of both quantitative and qualitative data collected in this study:

1. The student teachers in the present study demonstrated good teaching behaviours in terms of time spent in instructional and managerial behaviours.
2. The in-service student teachers demonstrated that they were more effective than the pre-service student teachers in terms of time spent in the lesson. They spent significantly more time in instructional behaviours and significantly less time in managerial behaviours than the pre-service student teachers.
3. The in-service student teachers gave significantly more response presentation time than the pre-service student teachers, as they provided more feedback and support to students.
4. The pre-service student teachers spent significantly more time in planned presentation than the in-service student teachers, as they took more time in explaining and demonstrating the tasks to students.
5. The in-service student teachers spent significantly less time in equipment management, organization and behaviour management than the pre-service student teachers, as they demonstrated active skills in organizing learning activities, handling equipment and managing students' behaviours.

6. Both in-service and pre-service student teachers held common beliefs about the roles of physical education teachers and the purposes of physical education. They admitted that they developed these teaching beliefs and perceptions about physical education by the influence of their childhood physical education experiences as well as the training of the teacher education programme.
7. Institute supervisors, cooperating teachers and school students were found to be helping the student teachers' learning to teach during teaching practice.
8. There were both similarities and differences in decision making between the two groups of student teachers during different stages of teaching.
9. The in-service student teachers seemed to possess better subject matter knowledge, pedagogical knowledge and pedagogical content knowledge than the pre-service student teachers.
10. Differences in in-field teaching experience between the two groups of student teachers seemed to be the major reason that led to the differences in their teaching behaviours. More teaching experience provided the in-service group with more opportunities to refine their teaching by means of reflection in order to develop different types of teachers' knowledge for teaching.

5.9 Recommendations

This section presents recommendations for teacher preparation programmes as well as recommendations for future research in the area of studying the teaching behaviours of student teachers. Based on the results and conclusions of this study, the following recommendations are made for teacher preparation programmes:

1. As neither group of student teachers gave much motivational feedback and as the pre-service student teachers provided less supporting behaviours to students during their practice, physical education teacher educators in Hong Kong Institute of Education should remind students of, and emphasize, these perspectives when teaching the methodology courses.
2. As pre-service student teachers showed that they were weak in organizing learning activities and handling equipment when teaching, physical education teacher educators in Hong Kong Institute of Education should emphasize these skills and help the student teachers equip themselves with these pedagogical skills.
3. As the pre-service student teachers demonstrated that they had problems in choosing appropriate learning tasks and skill-applied games activities in games lessons, physical education teacher educators in Hong Kong Institute of Education should revise their teacher education programme so as to develop student teachers' competency in teaching and planning games lessons.

4. As teaching experience was demonstrated to be an important element in the development of effective teaching, physical education teacher educators in Hong Kong Institute of Education should revise the pre-service students physical education training programmes and extend students' opportunities and experiences in teaching physical education.
5. As different participants were shown to have different levels of helping the student teachers learning to teach during the teaching practice, physical education teacher educators in Hong Kong Institute of Education should recruit appropriate cooperating teachers, provide structure and detailed guidelines of student teaching experience to student teachers, and coordinate them to work actively with the institute supervisors.
6. As the pre-service student teachers appeared to be lacking sufficient teachers' knowledge for the teaching practice, physical education teacher educators in Hong Kong Institute of Education should provide extended programmes for developing subject matter knowledge as well as putting more emphasis on helping student teachers in learning pedagogical knowledge and pedagogical content knowledge during the methods course.

Recommendations for future research:

1. As the small sample makes generalizations from this study difficult, there is a need to replicate the study with an adequate sample size of pre-service and in-service physical education student teachers to allow for sufficient power in examining the difference of their teaching behaviours.
2. As the sample in the present study was delimited to one teacher education institute, there is a need to replicate the study with a sample from different teacher training institutes.
3. As the sample in the present study was delimited to final year students of a two-year full time certificate programme in primary education and final year students of a three-year part time in-service course of training for teachers in primary school, there is a need to replicate the study with a sample from other teacher preparation programmes, such as Full-time Post Graduate Diploma in Education and Part-time Post Graduate Diploma in Education programmes.
4. As the teaching behaviours examined in the present study was delimited to ball games activities, there is a need to replicate the study by examining teaching behaviours in other sports activities during the teaching practice.
5. Future studies should also involve examining the influence of other potential factors, such as the sociocultural aspects of the teachers' teaching, teaching contexts and students' characteristics, on the teaching behaviours of physical education student teachers.

5.10 Overview of the Chapter

The results of the quantitative data showed that there were significant differences in instructional and management behaviours between the primary physical education pre-service and in-service student teachers. In terms of time spent, the in-service student teachers seem to perform better than their pre-service counterparts. The findings of the qualitative data also indicated there were differences in teaching behaviours, teaching strategies as well as decision making during different stages of teaching between the two groups of student teachers even though they held similar teaching beliefs and perceptions about physical education. Such a difference might be attributed to the in-service subjects having more in-field teaching experience and opportunities for reflective practices. With these reflection experiences, the in-service subjects might develop better teacher knowledge for teaching. This supports the notion that in-field experience is a vital component of effective teaching. There is no short cut from novice to expert. However, there is still a need for us to further examine what other factors might well contribute to the differences in their teaching behaviours. If we continue to gain more insight and information about the teaching performance of the pre-service and in-service student teachers in ball games lessons, we may be able to establish the shortest route to developing teaching competence in ball games for student teachers in the near future. All in all, the findings in both the quantitative and qualitative data are invaluable to teacher educators when they develop teacher education programmes as well as supervising student teachers during their teaching practice.

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Appendix 1

Outlines of the Two Teacher Education Programmes

Course Title	Certificate in Primary Education (Two-year Full-time) Course	In-service Course of Training for Teachers in Primary School (Three-year Part-time)
Course Aim	To prepare graduates to become qualified teachers in primary schools	To provide initial teacher education for in-service primary school teachers who, although suitably qualified academically, do not possess the basic professional preparation and qualifications, which would make them eligible for classification as “Qualified Teachers”.
Course Structure	Five Domains: 1. Academic Studies 2. Curriculum Studies 3. General Education 4. Professional Studies 5. Practicum	Five Domains: 1. Elective Studies 2. Primary Studies 3. General Education 4. Professional Studies 5. Practicum

Adapted from Hong Kong Institute of Education (1999a) Programme handbook:

Certificate in primary education (Chinese) Two-year Full-time programme. Hong Kong:

School of Foundation in Education and Hong Kong Institute of Education (1999b)

Programme handbook: In-service course of training for teachers in primary schools

(Three-year Part-time). Hong Kong: School of Foundation in Education.

<p>Domains Modules offered:</p>	<p><u>Academic Studies</u></p> <ul style="list-style-type: none"> • Skills Proficiency I • Skills Proficiency (Lower Primary) • Skills Proficiency II • Sports Science • Knowledge of Language I • Knowledge of Language II • Stylistics analysis and Writing • Special Topics on Language Studies • Culture and Society (Hong Kong Studies) I • Introduction to Mathematics • Science for Primary Education <p><u>Curriculum Studies</u></p> <ul style="list-style-type: none"> • PE Curriculum • Teaching Techniques in PE • Primary Curriculum in HK • Understanding Primary Curriculum • Personal and Social Education • Teaching of Primary Chinese • General Studies: Primary Curriculum and Teaching I • Primary Mathematics Curriculum and Teaching I • Primary Mathematics Curriculum and Teaching II <p><u>General Education</u></p> <ul style="list-style-type: none"> • Foundations of Information Technology in Education • Lifeskills • Basic Putongua <p><u>Professional Studies</u></p> <ul style="list-style-type: none"> • Human Development: Childhood and Adolescence • Learning and Teaching • Instructional Design and Strategies for Effective Teaching • Classroom Teaching Skills • Productive Human Relationships in School • Design and Developing Instructional Media • Sociological Foundation of Education • Philosophical Foundation of Education <p><u>Field Experience</u></p> <p>This includes a range of practicum seminars, school visits, attachments, trial teaching, co-operating teacher scheme, and block teaching practice. It is intended to provide students with necessary experiences in primary schools and link up these experiences with theories through reflective discussions</p>	<p><u>Elective Studies</u></p> <ul style="list-style-type: none"> • PE Curriculum • Teaching Techniques in PE • Skills Proficiency I • Skills Proficiency (Lower Primary) • Skills Proficiency II • Sports Science <p><u>Primary Studies</u></p> <ul style="list-style-type: none"> • Teaching Methods in Primary Chinese Language I • Learning and Teaching Mathematics • Primary Studies (General Studies) • Teaching Methods in Primary Chinese Language II • Concepts in Primary Mathematics • Primary Studies (General Studies II) • Teaching Methods in Primary Chinese Language III • Learning and Teaching Mathematics III <p><u>General Education</u></p> <ul style="list-style-type: none"> • Basic Putongua • Integrating Information and Communication Technology in Education • Implementing Civic Education in School <p><u>Professional Studies</u></p> <ul style="list-style-type: none"> • Primary Curriculum in HK • Modern Trends in Teaching and Learning • Human Development: Childhood and Adolescence • Roles and Relationship in School • Current Issues in Primary Teaching • Organizational Change for primary School Teachers (Optional) • Application of Information Technology in Teaching and Learning (Optional) • Foundations of Education (Optional) • Personal and Social Education (Optional) • Psychology of Learning (Optional) • Design and Developing Instructional Media (Optional) <p><u>Practicum</u></p> <p>This includes lesson planning, lessons for analysis, the actual teaching and the post-lesson reflection and evaluation. Practical teaching by student teachers in their schools is supervised throughout the three-year programme.</p>
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Appendix 2

Definitions of the Teacher Instructional and Managerial Behaviours Categories Coded by the Physical Education Teacher Assessment Instrument.

Instructional Behaviours

Planned Presentation (PP): The time utilised to present planned instructional material to the pupils. Examples: (1) "The subject of today's lesson is ..." (2) "Today we will begin work on the forehand drive."

Response Presentation (RP): The time utilised to restate, emphasize, or summarize information relative to the aspects of a performance. Example: (1) "Let me explain the main teaching points to you again..." (2) "Remember everyone, keep your eye on the ball."

Monitoring (M): The time utilised to observe the learning environment. This may include some incidental talk. Examples: (1) The pupils are engaged in a practice and the teacher watches the whole class from the side of the playing field. (2) The teacher watches one pupil throw a javelin.

Performance Feedback (PF): The time utilized to provide information relative to the aspects of a performance that is specific to the immediate execution of a skill. Examples: "Make sure you pick the bat before the bowler releases the ball." (2) "Your decision to move to the net following that approach was correct."

Motivational Feedback (MF): The time utilized to provide general responses to a skill attempt. Examples: (1) "Well done." (2) "Brilliant attempt."

Teacher Instructional Time (TIT): The total time the teacher utilizes to present, monitor, and provide feedback to the pupils and the sum of PP, RP, M, PF, and MF.

Managerial Behaviours

Beginning/Ending Class (BEC): The time utilised to begin the lesson, record tasks, and to end the lesson. Examples: (1) The teacher checks that all the pupils in the class are present. (2) The teacher sends groups of pupils into the changing room at the end of a lesson.

Organization (O): The time utilised to organize for skill development or game play. Examples: (1) The teacher organizes the class into groups for a new practice. (2) "Get into pairs as quickly as you can."

Equipment Management (EM): The time utilized to obtain, set up, distribute, or collect equipment. Examples: (1) The teacher passes out tennis balls to the pupils. (2) The teacher places cones on the playing field in order to mark areas for the practice of different skills.

Behaviour Management (BM): The time utilized to provide feedback relative to pupil behaviour. Examples: (1) The teacher reprimands a pupil for off task behaviour. (2) The teacher speaks to a pupil who arrives late for a lesson.

Other Tasks (OT): The time utilized for purposes other than class management or instruction. Examples: (1) The teacher stops monitoring the class to converse with the headteacher. (2) The teacher attends to a pupil who has been injured.

Teacher Management Time (TMT): The total time the teacher is engaged in class organization, not directly related to teacher instruction time and the sum of BEC, EM, O, BM, and OT.

Appendix 3

Instructions for Videotaping the Lessons

The following guidelines have been provided to assist you in videotaping your physical education classes.

1. Please select two classes ranged from primary 3 to primary 6. Videotaping one class on one day and the other class the following day if possible. The content of the lessons can be anything within the ball games curriculum for primary schools suggested by the Hong Kong Curriculum Development Council (Curriculum Development Council, 1995).
2. The camera should be placed in a spot from where the entire teacher's teaching behaviours can be seen. Moreover, this should be a safe spot and should not interrupt the teaching of the lessons.
3. The camera should be placed in the playground one lesson before the actual recording of the lesson. Tell the students the purpose of the recording. The purpose of this is to minimize the reaction to, and effects on the student of, the videotaping procedure.
4. Have an assistant operate the camera for you if possible. The use of a tripod is highly recommended. Remember to turn on the microphone before the lesson begins and ensure the audio recording of the teaching during the lesson.
5. The recording commences when the teacher and the first pupil enter the playing area and continues until the pupils are dismissed.
6. Re-charge the battery of the video camera overnight. Typically, batteries last for about 45 to 60 minutes of videotaping. Check the function and battery of the video camera before the lessons.

Appendix 4

Pre-lesson Interview Guides

Warm Up

- Thank you and welcome introduction; Explain the purpose of the interview
- Assure confidentiality
- Ask permission to audio-tape and make notes
- Their right to stop and the need for further clarification

Gaining knowledge of participants: background information; concepts of teaching physical education; preparation and planning for teaching.

Background

- Tell me some of your past experiences in physical education and sports?
- Why do you want to be a physical education teacher?
- What are the significant events or people that made you choose physical education training?
- How many years have you taught primary physical education including this year?
How long have you been teaching in this school? What grade levels are you currently teaching physical education? What other subjects do you teach?
- Where did you graduate in your secondary education/ tertiary education?

Concepts of Teaching Physical Education

- What is/are the purposes of schooling? What is/ are the purpose/s of physical education? What are the significant events or people that made you have these responses?
- What is/are the roles of teacher? What is/are the roles of physical education teacher? What are the significant events or people that made you have these responses?
- What knowledge does a physical education teacher need in order to fulfill his/her roles in school? Why?
- Besides knowledge, what skills does a physical education teacher need in order to fulfill his/her roles in school? Why?
- What experience should a physical education teacher possess in order to fulfill his/her roles in school? Why?
- Other than knowledge, skills and experience, what are the elements that a physical education teacher needs to possess in order to fulfill his/her role in school?
- What would you consider as good physical education teaching? Why?
- What would you consider as the most difficult part in teaching physical education? Why?

- What do you think of “what to teach” and “how to teach” in physical education? How do you start a physical education lesson? How do you organize the student learning in physical education lesson? How do you present your teaching content? How would you end your lesson? What are the significant events or people that make you to have these responses?
- What kind of instructional strategies do you usually employ in teaching physical education? Why?
- Describe how you prepare your lesson planning in physical education teaching? What kind of activities will you include in the lesson? What resources will you need or use during this planning? What are the significant events or people that influenced your lesson planning?
- What would you consider as a successful physical education lesson? What are the significant events or people that made you have these responses?
- What are the differences between the classroom and gymnasium/playground settings in terms of teaching environment? What are the significant events or people that made you have these responses?
- Describe the most difficult discipline/management problem you can think of? How do you tackle it? What are the significant events or people that made you have these responses?
- What strategies would you use to control the students in class? What are the significant events or people that made you have these responses?
- How do you motivate your students to learn in physical education lesson? What are the significant events or people that made you have these responses?
- Did you enjoy teaching physical education?
- What were the main effects of your former physical education teacher?
- What were the main effects of your experience in sport?
- What were the main effects of your experience as a student in physical education classes?

Instructional Planning

- Have you taught this particular lesson content before? How often?
- Describe your knowledge of the chosen content?
- Describe your own experience of the sport that you choose to teach.
- What content are you going to cover in this lesson?
- What are the differences in planning when compared to your first teaching of this content? Why did you change the planning?
- What do you expect to accomplish in this lesson? What are the objectives of the lesson?

- What factors would you consider may hinder you in the accomplishment of the lesson?
- What difficulties did you have when you taught this content to the same grade level students last time?
- What regular routines and regulations have you already put in place for your students?
- What difficulties did you have when you prepared this lesson?
- What are the differences between teaching games lesson and teaching other topic areas in physical education lesson?
- Are there any differences in teaching strategies?
- What do you expect your students to gain from the lesson?
- How do you expect your students to behave in the lesson?
- How would the students be evaluated in the lesson?
- Tell me something about the class you choose to teach. Have you taught them before? How well do you know them?
- Are there any important points that I have not asked about regarding your preparation in teaching this lesson?

Appendix 5

A Sample of Pre-lesson Interview of Sze

Q: Do you participate in any sports?

A: Yes, I was the volleyball team member in primary school and played school team basketball and table tennis in secondary school. I've been coach of Taekwando and table tennis for a long time. Moreover, I was once selected as HK Team of Taekwando, but I didn't represent HK to take part in any competitions.

Q: Have you taken part in any sports competitions?

A: I have played inter-school basketball matches for my secondary school and I have taken part in the Tsuen Wan District Table Tennis Competition.

Q: Why do you want to be a PE teacher?

A: I am an active person and I'm interested in sports. Being a PE teacher seems to be the career that I want.

Q: Did any special events / people influence you to make this choice?

A: During my secondary education, my PE lessons were very free. The negative teaching methods of the PE teachers gave me the impression that being a PE teacher was very comfortable.

Q: When did you find yourself having an interest in sports?

A: During my secondary education, I represented my school to take part in the Taekwando competition. I started to love sports.

Q: How many years (including this year) of primary school PE-teaching experience did you have?

A: Several weeks, counting from the start of this teaching practice.

Q: To which classes are you teaching PE in this school?

A: Primary 4 & 6.

Q: Are there any other subjects you need to teach?

A: Teaching Primary 2, 3 and 4 Chinese, Mathematics and General Studies.

Q: Which Secondary School did you graduate from and at which University are you studying now?

A: TWGH Wu Yuk Yue Memorial College and the HKIEd.

Q: What are the main objectives of education?

A: To learn more things; to enlarge social intercourse because we can meet many people in school. Students can ask what they don't understand, and I think being a teacher can set a good model for students.

Q: Then what are the main aims of PE?

A: To enhance students' health and fitness development; to make the PE lesson not a boring lesson and to teach PE knowledge to students.

Q: Are there any special events / people that gave you these ideas?

A: Although my secondary school PE lessons were so free, I found that I could learn some basic skills in sports. Students could play what they liked. These experiences gave me these ideas.

Q: What are the major roles of schoolteachers?

A: Students' listeners; to help students when they have problems and to educate them.

Q: How about the major roles of PE teachers?

A: I think it is just the same as other schoolteachers.

Q: Are there any special events / people that gave you these ideas?

A: My personal experience did. During my secondary education, students would find teachers to help if they had problems, instead of their parents.

Q: What prerequisites does a PE teacher need to have in order to fulfill his role and carry out his duties in school?

A: He should have a deep understanding of PE and sports. He should have good communication skills with students, and understand how to treat special students and help them to join the sports activities. PE teachers should have a good voice in order to attract students during his teaching.

Q: What experiences should a PE teacher have in order to help their teaching?

A: It would be better if he has teaching experience or being an athlete and having experience in sports competitions. These experiences can indirectly benefit their students too.

Q: Any other skills that PE teachers should have in school?

A: They should have to understand various skills in sports, because they have to give demos to students and they should have the ability to correct students' mistakes when learning sports techniques.

Q: How do you describe a "good" PE lesson?

A: Students should be happy and learn something about PE. Students are enjoying the lesson. Teacher can achieve his lesson teaching goals.

Q: Why do you think so?

A: That's what I learnt from IEd during PE teacher training.

Q: What difficulties do you have when teaching PE in this school?

A: As I'm not good at every sports skill, I sometimes can't do the demo well. I even can't identify and correct the students' mistakes when they are practising. Therefore I lose my confidence in teaching.

Q: How do you choose the teaching content and the teaching methods of the lessons?

A: Based on the guides provided by the school. I hope that students can learn something when participating in the activities.

Q: How about if the teaching content is decided by yourself?

A: I will base it on the ability of the students, e.g. to primary students, I will teach them some basic sports skills. I will take the curriculum outline suggested by the Educational Department as reference.

Q: How do you start a PE lesson?

A: Students have to do warm-up first. I will divide the teaching content into several parts and teach them in an orderly fashion. Students will apply the technique when they participate in the applied-skill activities afterwards.

Q: What kind of warm-up activities do you usually arrange for your students?

A: Students need to run around the playground and have stretching exercises related to the teaching content.

Q: How do you organize your students to learn in the PE lesson?

A: Firstly, I will gather all students to sit down and listen to what I introduce. Then I will divide them into several small groups to practise. Lastly they will form bigger groups to apply the learnt technique.

Q: How do you present the contents?

A: By giving demos or detailed explanation.

Q: How do you end up a PE lesson?

A: I usually choose students to do some demos in front of the class. By taking this opportunity, I re-emphasize the major points of the techniques based on their performance.

Q: Are there any special events / people that gave you these ideas?

A: From what I learned in IEd, and I also think it is useful when I am in internship.

Q: What teaching method are you using now?

A: Direct instruction method. I will introduce the tasks and ask the students to follow and practise.

Q: Why do you choose this method?

A: As a PE lesson has only 30 minutes. In order to save time, it is the most direct and efficient method for students to learn.

Q: Have you tried other methods?

A: Not yet in this internship.

Q: How do you prepare and plan for the PE lesson?

A: Write a brief teaching plan of the lesson first. Follow by considering the time, the teaching steps and equipment I need. I will also find some references to help my lesson planning.

Q: What kind of teaching activities will you arrange for your students?

A: Those activities that involved many students learning at the same time.

Q: Other than books, what kind of resources do you use for your lesson preparation?

A: Some videos and VCD.

Q: Have you found someone for help in lesson preparation?

A: Yes, I have found friends, classmates and lecturers for help if necessary.

Q: Are there any special events / people that gave you these ideas?

A: As I have to teach badminton in this internship. However, I'm not very good at badminton. So I find my friends to teach me badminton before my internship starts. He really helps me a lot and I can do the demo properly during the lessons.

Q: How do you describe a "successful PE lesson"?

A: Students' participating rate is high and teachers can achieve their planned goals. Lastly, students can have a happy and relaxed PE lesson.

Q: Are there any special events / people that gave you these ideas?

A: That's what I learned from IEd.

Q: What do you think are the major differences between teaching in classroom and in playground?

A: In the classroom, the space is limited and there are many obstacles. But the playground is larger. It is easier to have PE lessons on the playground than in the classroom.

Q: Are there any special events / people that gave you these ideas?

A: In my secondary education, we had to stay in the classroom to do some academic revision for the PE lessons during rainy days. The major reason for this arrangement was due to the space of the classroom not being enough for the PE teacher to teach sports skills.

Q: What is your biggest problem in students' discipline and classroom management?

A: Students sometimes are very noisy and I hardly know how to control them. Students may have accidents and get injured when they are not in your control.

Q: How do you solve these problems?

A: To let students know what my requirements are in the first lesson. I will punish them if necessary.

Q: Are there any special events / people that gave you these ideas?

A: I think it is better to treat students in a strict way at the beginning.

Q: What methods do you use to control students' discipline?

A: To embarrass the naughty students in front of the whole class; to scold them immediately when they misbehave in order to let them know the teacher has noticed their misbehaviours.

Q: How do you enhance the students' learning incentive in PE lesson?

A: Introduce and arrange more interesting activities for them.

Q: Are there any special events / people that gave you these ideas?

A: From my childhood experience in PE lessons.

Q: Do you enjoy teaching PE?

A: Yes, until now, I do not have many problems in teaching. Students are not naughty.

Q: What satisfaction do you get from teaching?

A: I get respect from my students and I teach them PE knowledge.

Q: Did your previous PE teachers have any influence on your teaching now?

A: My secondary school PE teachers put much emphasis on after school training. This makes me understand that more practice can help students to get better results in the inter-schools competitions. The relationship between the PE teachers and students was very good. That's why I like PE.

Q: Does your experience in sports have any influence on your teaching now?

A: As I have participated in ball games and Taekwondo competitions, I know the rules of these sports very well. This helps my teaching. Being an athlete before can also help me to give advice to students to lessen their anxiety in sports competitions.

Q: Do your childhood PE lessons have any influence on your teaching now?

A: My secondary school PE lessons were very free. Students enjoyed the lessons very much. Although students might learn some basic sports skills only, they were really happy. I also want my students to have this feeling in their PE lessons.

Q: Then why don't you use this teaching method?

A: It is because students could not learn many skills in their PE lessons. Therefore, in my PE lessons, more skills teaching will be introduced.

Q: What is the content of the volleyball lesson you are going to videotape?

A: The main theme is volleyball. I want students to learn digging in the lesson.

Q: Have you taught this skill before?

A: No.

Q: How much do you understand about the content of this lesson?

A: I have some practical experience in volleyball. I've played volleyball for my secondary schools. I also took part in volleyball activities during my teacher training in IEd.

Q: What achievements do you expect your students to have?

A: Students will learn the technique of digging in volleyball.

Q: What is your objective in this lesson?

A: Students can use digging to hit the ball 5 times.

Q: What factors may hinder you from achieving your lesson objective?

A: The PE resources are very limited. There are not enough volleyballs. Students' discipline may also affect today's lesson.

Q: What routine training do you give your students in the lessons?

A: I will ask them to sit down quietly and pay attention to my demonstration. I will assign 4 students to help me to get the equipment for the lesson. Students have to keep quiet when they are queuing up.

Q: Is it successful?

A: Yes.

Q: Did you find any problems when you prepared today's lesson?

A: I found some soft volleyballs had got wet. There will be fewer resources that I can use in the lesson.

Q: Did you have any problems with the teaching content and the teaching method of today's lesson?

A: As I have not taught volleyball before, I need some time to think of the class organization and the arrangement of my teaching content.

Q: Are there any differences when you teach ball games and other sports activities, such as gymnastics, dancing, and track and field?

A: For ball games, I can divide students into more small groups and teach them step by step. For other sports, such as gymnastics, it will be more dangerous if students are learning in small groups.

Q: Is it easier for you to teach ball games lessons?

A: Yes.

Q: Are there any differences in your teaching methodologies between ball games and other sports activities lessons?

A: For ball games, it is better to use the direct teaching method. However, the inquiry method can also be used. Therefore, students will have more opportunities to practise.

Q: How about other sports activities?

A: I think using the inquiry method to teach other sports activities will cause more accidents

Q: Other than the direct teaching method, have you tried other teaching methods in ball games lessons?

A: Not yet.

Q: Why?

A: I'm afraid that using other methods may mean spending more time than in the direct teaching method as I have only 30 minutes in each PE lesson.

Q: Will you try other methods in the future?

A: I think I will try later.

Q: How do you describe a "successful ball games lesson"?

A: Students should be happy and can learn something in PE lesson. Students should enjoy the lesson. Teacher can achieve her teaching goals.

Q: What difficulties do you have when you plan a PE lesson?

A: The limited facilities and resources and unexpected bad weather.

Q: What benefits can a student get from your PE lesson?

A: I hope that they can learn how to use digging to hit the ball and enjoy the lesson as well.

Q: How do you expect your students to behave in this lesson?

A: They may be noisy, but I think they will follow the instructions that I give.

Q: How do you evaluate the results of your students?

A: Whether the students can use digging to hit the ball 5 times continuously, or based on their performances during applied-skill activities.

Q: Can you tell me something about your students in the coming volleyball lesson?

A: They are Primary 6 students with 32 pupils, 17 girls and 15 boys. They are not very naughty, but girls are more passive than boys.

Q: Have you taught this class before?

A: Yes, only one lesson.

Q: How well do you know them?

A: Not very, just getting some information from the regular PE teacher.

Q: Have you taught them volleyball before?

A: Yes, because of the time problem, I could not teach them all the skills that I planned in the previous lesson.

Q: Are there any differences between the content of the previous lesson and today's lesson?

A: Not too much. As students didn't have enough time to grasp what I taught last time, I need to follow up what I introduced in the previous lesson.

Q: Did you find any problems with the teaching content in the previous lesson?

A: As there was a long school announcement in the last PE lesson, it delayed 15 minutes lesson time. That's why students didn't have enough time to learn.

Q: How about today's lesson?

A: I think students will have sufficient time to learn today.

Appendix 6

Post-Instruction Interview Guides

Background

- Age
- Length of class period
- Information about the school (size, socio-economic make up)
- Administrative support for PE in school

Evaluation of their Teaching Performance

- Did you achieve your objective in the lesson?
- Which part of the lesson went on as you expected? And which did not? Why?
- What are the factors that influenced your planned task? (Students, Equipment, Time, Space and Others)
- What do you feel about your teaching in the lesson? (Success, Disappointment, Challenge) Why?
- If you were going to teach the same content again, would you teach the same way? Why? Would you use the same drills/tasks? Would you change the games (skill applications)? How?
- How did the students feel about the lesson? Did they enjoy it?
- How did the students perform during the lesson? How did you evaluate their performance?

Comments on the Teaching Practices

- How do you describe your practicum in PE/ teaching this year? What are you most satisfied with? What are you most concerned with and need to improve in future?
- Describe how your practicum/ two/three years teaching PE under supervision influenced your teaching in future? Is there any significant incident or teaching event that was significant to you?
- What would you do differently (Teaching) compared to how you started your practicum 10 weeks ago/teaching PE under supervision 2-3 years ago?
- How did your practicum supervisor influence your PE teaching in future? Is there any significant incident or teaching event that was significant to you?
- How did the students influence your PE teaching in future? Is there any significant incident or teaching event that was significant to you?
- What were the conflicts between your PE teaching and the school culture during your practicum/ teaching under supervision? How did you resolve these conflicts?
- How did you improve your teaching performance?

- In what way did the teacher education programme in the institute help you learn to teach?
- How do you feel about the teaching practice within the teacher education programme?
- List the advantages and disadvantages of the teaching practice.
- Were there any constraints within the school context that you teach? What were they?
- In learning to teach, what is the most important factor within the school context that helped your teaching development?

Appendix 7

Stimulated Recall Interview Guides

1. What was happening during this segment?
2. What were you thinking at this moment?
3. Did the lesson proceed as planned?
4. If not, was a new routine necessary?
5. Did you have one in mind?
6. Was a new routine introduced?
7. What were they?
8. Did you face any unusual problems or circumstances during this segment?
9. If so, what caused them?
10. What factors influenced your decisions about the choice of actions?
11. Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

Appendix 8

A Sample of Post-lesson Stimulated Recall Interview of Yung

Q: How old are you?

A: I am 29.

Q: What is the duration of this lesson?

A: 35 minutes.

Q: What is the background of this school?

A: It has 11 classes with 35 students each.

Q: How are the students' performances in class?

A: Their academic and discipline are not very good.

Q: Does the school that you are teaching now support PE?

A: Not too much, but it may be hindered by the school environment e.g., the school has to share the playground with another school.

Q: How about the resources in PE?

A: The school has provided financial support. However, the school has no place to store the newly bought equipment.

Q: Does your school encourage students to participate in inter-school sports' competition?

A: Yes.

Q: Does your school provide regular extra- curricular activities involving sports?

A: Yes, on every Friday, they are organized by the PE teachers.

Q: Which class did you teach in this lesson?

A: Primary 4.

Q: What was the content of this lesson?

A: Bounce pass in basketball.

Video show

Q: How much do you remember? What was happening during this segment?

A: Students were doing some warm-up exercises, moving left and right. Those are the moving skills of basketball.

Q: How are students' performances?

A: Not many students could perform the technique well.

Q: What were you thinking at that moment?

A: I thought that I should teach this skill in the next lesson.

Q: Did the lesson proceed as planned?

A: No.

Q: If not, was a new routine necessary?

A: No.

Q: Did you face any unusual problems or circumstances during this segment?

A: No.

Q: What factors influenced your decisions about the choice of actions?

A: The moving skills were not the main theme of the lesson and I did not want to put much time into learning them.

Q: Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

A: My personal decision.

Video show

Q: How much do you remember? What was happening during this segment?

A: As I wanted them to practise more basic skills, I arranged students practising bounce pass. And I did the demo for them, and I also asked a student to do a demo. Then I asked them to pair up and went to get the basketball balls.

Q: What were you thinking at that moment?

A: I was thinking that if I could give them clearer instructions, they would have paid more attention to me and they would like to play basketball. Also, I was thinking what's the next progressive step in teaching.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you find any difficulties at that moment?

A: Too many students went to get the balls. There was a little bit of confusion.

Q: Did you change your teaching method at that time?

A: As there was no big problem and I wanted the lesson to be smoothly run, I didn't change it. But I thought I had to improve my teaching next time.

Q: Where did you learn this teaching strategy?

A: From the lecturers and advisers in IEd.

Video show

Q: How much do you remember? What was happening during this segment?

A: I was teaching them the skills of sliding steps and ball passing. I was observing their performance and reminding them the teaching points of the techniques.

Q: How are the students' performances?

A: Almost up to my expectations.

Q: What were you thinking at the moment?

A: A little bit happy because students were enjoying themselves.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you find any difficulties?

A: The space was too small and there was a large number of students. I was afraid they would get hurt and injured.

Q: Did you change your teaching method?

A: I just reminded them to be more careful in the lesson.

Q: What made you come to this decision?

A: That was my past teaching experiences and I learnt from IEd. Teachers had to be much concerned with students' safety.

Video show

Q: How much do you remember? What was happening during this segment?

A: Students were continuing the practice.

Q: What were you thinking at that moment?

A: I was thinking whether the exercises were too difficult? But all seemed quite good. I would change my teaching strategy if I found problems.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you face any unusual problems or circumstances during this segment?

A: No.

Q: What factors influenced your decisions about the choice of actions?

A: The students' performance.

Q: Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

A: I learnt it from my teaching experience.

Video show

Q: How much do you remember? What was happening during this segment?

A: Students had just finished practising the skills. I was reminding them some important points of the previous skill techniques. And then I explained the applied game that was the 3 on 3 basketball match. And I asked one group of students to do the demo for them.

Q: What were you thinking at that moment?

A: I wanted the lesson to run more smoothly, and I was observing whether they had learnt the skills or not.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you find any difficulty?

A: No.

Q: What factors influenced your decisions about the choice of actions?

A: The time factor and the students' performance.

Q: Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

A: My own teaching experience.

Video show

Q: How much do you remember? What was happening during this segment?

A: The students were playing two modified games. One was the 3 on 3 basketball match; and the other one was the monkey game.

Q: What were you thinking at that moment?

A: I was concerned about how they were playing in the games. If they did it wrongly, I would remind them.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you face any unusual problems or circumstances during this segment?

A: No.

Q: What factors influenced your decisions about the choice of actions?

A: The students needed some time to apply their learnt skill in the game situation.

Q: Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

A: I learnt this from the lecturer in IEd.

Video show

Q: How much do you remember? What was happening during this segment?

A: These two groups switched their games, and I explained the rules again because I wanted the lesson to run more smoothly.

Q: Did the lesson proceed as planned?

A: Yes.

Q: Did you find any difficulties?

A: No.

Q: What were you thinking at that moment?

A: I hoped everything could follow my teaching plan.

Q: What made you having this teaching strategy?

A: The teachers of IEd.

Video show

Q: How much do you remember?

A: The students were playing their games and I was observing the students playing the games. When I found some were not playing properly, I would go and give feedback to them. After the game, I asked them to do some cool-down exercises.

Q: Did the lesson proceed as planned?

A: Yes, it was faster than I expected.

Q: Did you face any unusual problems or circumstances during this segment?

A: No.

Q: What were you thinking at that moment?

A: I thought that students' performance in this lesson was acceptable.

Q: What factors influenced your decisions about the choice of actions?

A: The students' performances and I just wanted to help them learn.

Q: Where did you develop or learn these strategies? What were the significant events or people that influenced your decisions and actions?

A: I learnt it from IEd.

Q: On the whole, did you achieve the goal in this lesson?

A: Yes, students could do what I asked them to do. And I found the planned activities matched the applied games.

Q: Which part of this lesson came up to your expectations?

A: The sliding steps.

Q: Which part of this lesson was below your expectations?

A: Few students did not follow my instructions in the game play.

Q: What factors affected your teaching in this lesson?

A: Students' ability was quite good; time and space were enough; and I had used some smaller balls instead of real basketballs, this made it easier for students to handle.

Q: How was your teaching performance in this lesson?

A: I think I have achieved my lesson goal, but I was a little bit excited.

Q: If you are going to teach the same content later, will you use the same teaching method?

A: Yes, because this teaching method is quite good, the students learn the skill step by step. But I will have different expectations for different classes.

Q: If you are going to teach the same content later, will you use the same practising activities?

A: Many of them would be reused again.

Q: How about the games and the application activities?

A: It will depend on whether the students have learnt the skill before.

Q: Did students enjoy this lesson?

A: Yes.

Q: How were the students' performances?

A: They were active enough.

Q: How did you assess your students?

A: By observation.

Appendix 9

A Sample of Field Notes of Chu in Teaching P. 4 Basketball

Teacher instructed the students to spread out in the playground. She gave the instruction in a clear and loud voice. Students followed the instruction and quickly spread out. They then watched and listened to the teacher for further instruction. The whole class was in good order and well disciplined. Every student settled within a few seconds. It seemed that they had good class routine training and practice. Chu used hand signals to assist her further in class organization into groups gathering. The students responded quickly according to her signal.

Chu gave a demonstration and explanation to the students about the basic dribbling technique without movement. All students watched the demonstration quietly and attentively. After watching the demonstration, the students spread out in pairs as instructed by the teacher and practised the dribbling. Their movement was fast and they looked as if they were eager to learn and practise the dribbling skill. The students without the ball also participated in the learning process by helping the others with the main learning cues of the dribbling technique. They seemed to enjoy this learning process and understood they were responsible to help their classmates learn. At this moment, Chu wandering around and gave feedback to the students.

Chu gave a hand signal and gathered the students again. Students responded and gathered in front of the teacher within a few seconds. Chu asked one student to demonstrate the dribbling technique in front of the class and she emphasized the main learning cues again. It seemed that she tried to give a deep impression of the correct dribbling technique to the students. Chu then demonstrated another new skill technique to the students—high dribbling moving forward. All students after watching the demonstration spread out quickly and practised the newly instructed dribbling technique. Chu kept on reminding the class about the learning cues of the dribbling technique. After two minutes, Chu asked the students to practise and dribble for longer distances. The whole class actively participated in the learning activity, the lesson seemed to have high activity and on task time. While the students were practising, Chu moved around and corrected the students' technique individually. Up to the present moment, Chu provided a long class instructional time. She gave precise demonstrations and also invited a student to demonstrate the skill. It looked like this was one of her teaching techniques in helping students to learn. Besides, she spent a

short instruction time in each teaching skill and fully used the playground for her teaching.

Chu gave another demonstration with the help of a student. She introduced the extending task by requesting the students to dribble around an unmoving partner standing at the far end and return to the starting position. After only one minute of demonstration, Chu instructed the students to spread out and practise.

While all students were spread out in the playground and practising, Chu divided the playground into districts by using skittles. She seemed to be preparing the group-applied activities for the later stage. She was using every minute of the lesson.

Chu then gathered the students and gave a concise briefing on the group-applied activities for skill application. Chu demonstrated and explained the first applied activity to the students. This was fast dribbling in a straight line and return to the original position. She further divided the two groups of students into four smaller groups to practise. She intended to give more dribbling opportunities to the students. She then requested a few students to demonstrate the applied activity to the class again. She seemed to make sure the whole class understood what the activity was. Chu then asked two groups of students to practise the first introduced applied activity. She explained and demonstrated the second applied activity to the rest of the class. The remaining four groups of students listened to her quietly. This was a group-dribbling relay, which required the last group member to hit down the skittle at the far end with bounce pass. This game activity required cooperation of group members as each member needed to dribble for a certain distance before she passed the ball to her group member. After the explanation, Chu requested another two groups of students to take part in the second applied activity. She further introduced the last activity to the last two groups of students. The last group activity is a conditioning exercise that required the students to throw the basketball to a certain distance. The purpose of this exercise is to develop arm strength of the students. As mentioned previously in an informal interview, the school principal wanted the PE teachers to spare some time helping the students to improve their health and fitness condition.

All students actively participated in their own assigned activities. They seemed to enjoy the activities prepared by the teachers. After two or three minutes, Chu brought the first two groups of students to watch the group three and four students participating in the second applied activity. She supplemented with a brief explanation. Subsequently, she asked groups three and four to stop and leave all the equipment for

groups one and two. By using the same organizational strategy, she brought the group three and four students to watch how groups five and six practising the basketball throwing exercise. After a short explanation, Chu then requested groups five and six to rotate and participate in the first applied activity. By leaving the basketball throwing to groups four and five, all six groups had switched and rotated their participation in the different applied activities. This makes the whole class run smoothly without stopping all students to listen to the instruction and demonstration. There were at least two thirds of the class participating in the assigned activities. This kind of class management strategy saves a lot of organization time. It in turn increases the instructional time and provides more time for the students to practise and learn.

While the whole class was practising, Chu moved around to each group and gave feedbacks and assisted their learning. After a while, Chu blew the whistle and used her hand signal to instruct the groups to rotate and change their applied activities. Within 30 seconds, all groups changed their positions and stood by for further instruction. The students seemed to be used to this kind of changing group procedures. Once again, after receiving Chu's signal, they started their activities again. All students were actively participating in the activities and looked to be enjoying them. However, all the applied activities designed by Chu seemed to be skill practising oriented. She did not prepare any modified games activities for them. No matter what activities Chu assigned, the students still looked to be enjoying them and actively participating.

After changing the groups twice, Chu instructed the whole class to put away the basketball and gather in front of her. She asked two students to demonstrate the dribbling technique again to the whole class. Chu highlighted the main points of the technique and gave appreciation to the students' brilliant performances. Chu lastly spread out the students and led them to doing various warm down stretching activities. After several short warm down activities, students were instructed to line up in pairs and went back to the classroom. Students quickly responded accordingly. The time management of Chu seemed to be perfect! The smooth running of the class may be due to her excellent routine training of the students and her precise and concise demonstration and instruction.

Appendix 10

Definition of Terms

Ball Games Activities: The ball games activities suggested by the CDC (1995) to teach in the primary physical education curriculum in Hong Kong. In the present study, the ball games activities are confined to basketball, football and volleyball activities.

Beliefs: An individual's judgment of the truth or falsity of a proposition, a judgment that can only be inferred from a collective understanding of what human beings say, intend, and do (Pajares, 1992, p. 316).

Content Knowledge: This refers to the knowledge that teachers possess about an area as well as knowledge of its structure (Shulman, 1986).

Effective Teaching Behaviours: The artistic orchestration of highly developed skills exhibited by teachers to meet the specific demands of a learning setting (Siedentop, 1991, p. 4).

In-service Primary Physical Education Student Teachers: Full-time primary school teachers who are currently teaching physical education but without qualified teacher status. In the present study, in-service primary physical education student teachers are those who are the final year students of a three-year part time in-service course of training for teachers in primary schools taking physical education as an elective at the Hong Kong Institute of Education.

Observation: Viewing an actual class lesson either in person or from a video tape. In the present study, the class lessons are restricted to primary physical education lessons.

Pedagogical Content Knowledge: Teachers' presentations and representations of content that blend knowledge of content, pedagogy, and students, through the verbalization and progression of tasks and feedback interactions (Shulman, 1987).

Pedagogical Knowledge: Principles and strategies that guide teachers' managerial and instructional practices intended to promote specific student learning.

Pre-service Primary Physical Education Student Teachers: Prospective primary school physical education teachers. In the present study, pre-service primary physical education student teachers are those who are the final year students of a two-year full time certificate programme in primary education taking physical education as an elective at the Hong Kong Institute of Education.

Stimulated Recall: Comments and responses to a series of questions after viewing video lesson segments of their own teaching in order to provide information about their explanations of and reasons for pedagogical decisions made during teaching. In the present study, the procedure of the stimulated recall session was modified from the study of Byra and Sherman (Byra & Sherman, 1993) investigating the decision making of pre-service physical education teachers when teaching lacrosse.

Teaching Behaviours: The instructional and managerial behaviours exhibited by the student teachers during their teaching practice. These behaviours are categorized by the Physical Education Teacher Assessment Instrument (PETAI) (Phillips, Carlisle, Steffen & Stroot, 1986) (See Appendix 2).

Teacher Education Institute: Institute whose primary purpose is to prepare teachers. In this study, the teacher education institute is confined to Hong Kong Institute of Education.

Teaching Practice: Part of student teachers' professional training that involves professional growth through experience and practice teaching in real school settings.