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TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE
AND PEDAGOGICAL THEORIES OF CONTENT

DISSERTATION

Presented in Partial Fulfillment of the Requirement for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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*****
The Ohio State University
1997

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ABSTRACT

The purpose of this study was to describe and examine two experienced teachers' pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions and practice of teaching. The focus of the study was on the instructional tasks and how they were communicated to students. Two research questions guided this study: (a) What instructional practices do experienced physical education teachers employ in teaching the target content (i.e., volleyball)? and (b) What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

Participants in the study were two experienced elementary school physical education teachers each of whom taught a unit of volleyball to one class of fourth- and one class of fifth- and/or fourth and fifth combined-grade students. Systematic observations of all classes, formal and informal interviews, and field notes were data sources. The case and cross case methods were employed for the analysis of data.

Findings indicated that the two teachers chose mostly different tasks to teach similar content, but each teacher assigned similar learning tasks to her students in the two grade levels. The teachers varied the task characteristics in terms of focus and organizational arrangements to adjust the content to individual needs and improve the quality of performance. Some of the tasks did not appear to advance efficiently authentic performance capabilities. Both
teachers used a wide repertoire of dynamic and alternative verbal and visual representations to communicate content to the students.

While the task choices, progressions, and alternative representations of content were based on and reflected the teachers' pedagogical content knowledge, the teachers' decisions concerning the inclusion and/or exclusion of content and sequence of skills were based on their pedagogical theories of content. The analysis showed that central to pedagogical content knowledge of physical education teachers are the task choices and progressions the teachers use in teaching to enhance the content understanding and authentic performance capabilities.
Dedicated to my family
for their love and support
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CHAPTER 1
INTRODUCTION

A current trend in educational research is characterized by the tendency to include subject matter related variables in the designs of pedagogical studies. Part of the reason for this trend is the evidence that content variables (i.e., structuring, coverage, etc.) appear to have considerable effect on student achievement (Brophy & Good, 1986). This finding was characterized by Doyle (1992) as ironic, possibly because, as he explained, historically, the pedagogical research was primarily conceptualized as being founded on the discipline of psychology. It may be argued that the absence of interest in the role and nature of content variables in the study of teaching (Shulman, 1986) reflected the conceptual and interpretive frameworks employed in pedagogical research. As a consequence, programs of research on teaching developed and evolved as if pedagogical and curricular or subject matter issues were unrelated to one another (Brophy & Good, 1986; Doyle, 1992).

In theoretical and empirical approaches to the study of teaching, however, there were 'signs' that subject matter or content variables had to be considered for a better understanding of teaching practices. Gage (1978), for example, in considering the role of subject matter in pedagogical effectiveness, maintained that both general and curriculum-specific teaching variables should be included in research on teaching designs. He wrote that "if different kinds of things are learned in different ways, different subject matters and curricular objectives
should call upon different kinds of learning and teaching. If this be so, we should look at the properties of different subject matters and objectives” (Gage, 1978, p. 78).

There is little doubt that, in the recent years, a considerable number of studies on teaching consider the role of teachers' subject matter knowledge and how it influences their teaching practices. The critique Shulman (1986) offered of the various teaching research traditions regarding the lack of attention to the role of teachers' subject matter knowledge and the purposes for which it is taught, did not go unnoticed by educational researchers. Shulman's (1987) article entitled "Knowledge and Teaching: Foundations of the New Reform" gave important impetus to this direction of research on teaching. Of the seven categories of knowledge considered to form the knowledge base of teaching, the category of "pedagogical content knowledge", which was conceptualized as the category of teachers' knowledge that "most likely [was going] to distinguish the understanding of the content specialist from that of the pedagogue" (p. 8), appeared to generate great research interest.

Pedagogical content knowledge, according to Shulman (1987), "represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are originated, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction" (p. 8). Pedagogical content knowledge is viewed as the capacity of a teacher to either adapt general pedagogical principles to particular subject matter (Marks, 1990) or to 'transform' the content knowledge into powerful pedagogical representations appropriate for the characteristics of the learners (Shulman, 1987). In the processes of transformation, the subject matter knowledge provides the central point (Wilson, Shulman, & Richert, 1987). Powerful pedagogical representations
of content are typically described as examples, analogies, metaphors, explanations or demonstrations a teacher may use to present content to students. Moreover, Doyle (1986) maintained that the tasks teachers design for students constitute forms of teachers' representations of content. These content representations have consequences for students' learning (Doyle, 1992).

Since the conception of the term, several frameworks have attempted to illustrate the nature and elements of the concept. For example, Grossman (1989), conceptualized pedagogical content knowledge as, a) knowledge and beliefs about the purposes for teaching a subject at different grade levels, b) knowledge of students' understanding, conceptions and misconceptions of particular topics in a subject matter, c) curricular knowledge, and d) knowledge of instructional strategies and representations. Cochran, DeRuiter, and King, (1993) conceptualized pedagogical content knowledge as knowledge of, a) environmental contexts, b) pedagogy, c) subject matter, and d) students. Although the models at first glance do not differ, the authors place different emphasis on the different elements. For example, Cochran, DeRuiter, and King, (1993) approach pedagogical content knowledge from a constructivist perspective by placing emphasis on the teacher's understanding of, a) students' ability to learn, their motivation, and their prior conceptions of the subject matter, and b) the social, political, cultural, and physical contexts that characterize the teaching and learning process. The constructivist perspective supports the assumption that students and their understandings create and shape the learning environment (Cochran, DeRuiter, & King, 1993). Grossman's (1990) framework of pedagogical content knowledge, on the other hand, tends to accept the assumption that the primary purpose of teaching is
academic in nature. For example, she wrote that pedagogical content knowledge "commits researchers to investigating the content of instruction" (p. 9) which centers around the role of subject matter in teaching. Although pedagogical content knowledge constitutes a distinct type of knowledge for teaching (Shulman, 1987), the fact that it includes other types of knowledge (i.e., content knowledge, pedagogical knowledge, knowledge of context) sometimes gives rise to confusion regarding its nature (Marks, 1990). Grossman (1990) and Marks (1990), for example, expressed concern about whether they had to interpret certain teacher comments as indicators of content knowledge or pedagogical content knowledge. Despite some ambiguities that can arise when interpreting teacher actions or comments, it appears that pedagogical content knowledge can exist and be treated as a specific type of teacher knowledge (Grossman, 1990; Marks, 1990; McDiarmid, Loewenberg, & Anderson, 1989). Researchers consider that this line of research is important because "it focuses on a neglected body of knowledge about teaching and attempts to capture the collective understanding and traditions of the profession about how subject matter is to be represented in classrooms" (Carter, 1990, p. 306). Subject matter representations, in turn, have consequences for students' learning (Doyle, 1992).

Considerable theoretical attention has also been paid to the role of teachers' value orientation and beliefs toward the content they teach. Brophy (1991) referred to teachers' orientations toward particular subject matters as the beliefs teachers hold about why they teach what they teach. Grossman, Wilson, and Shulman (1989) argued that teachers' beliefs about the subject matter influence considerably their teaching decisions and practices. Grossman (1990), Gudmundsdottir (1990a), and Wilson (1988) reported that the teachers' beliefs about the content affected their decisions about what and how they taught.
Doyle (1992) suggested that teachers have powerful theories of content, that are, "conceptions of what the content is, what it means to know that content, and what goals one is accomplishing when one is teaching the content" (p. 507). These theories of content "are grounded in knowledge of and beliefs about content and in conceptions of students' learning and motivation" (p. 509).

The teachers' theories of content appear to be important because the teachers enact them during the processes of subject matter transformation into powerful representations of content, that is, pedagogical content knowledge. An issue that has not been empirically addressed sufficiently, within the pedagogical content knowledge literature, in real classroom settings is the role of teachers' theories of content in their practices. Gudmundsdottir (1990a) pointed out that an important part of educational values which "has been ignored in most educational research is teachers' conceptions of the subject matter they teach" (p. 46). In addition, Fang (1996) stated that researchers almost neglected teachers' theories of subject matter or the role these theories may play in planning, and the interactive process of teaching and student learning. In the area of Mathematics, Ball (1991) stated that "in teaching, teachers' understanding and beliefs about mathematics interact with their ideas about the teaching and learning of mathematics and their ideas about pupils, teachers and the contexts of classrooms" (p. 21). In the field of physical education, the role of content or subject matter orientation affects the teaching and learning process (Siedentop, 1991). However, empirical evidence on pedagogical theories of content is almost non-existent in the field of physical education.

The concept of pedagogical content knowledge in physical education has been recognized as an important area of study. Siedentop, (1989), wrote that "pedagogical content knowledge is the 'main stuff' from which effectiveness and
expertise in teaching and coaching derives" (p. 2). Moreover, Rink (1990) asserted that "research efforts to understand teaching can no longer disregard the role of content in the design of studies and teacher preparation programs must begin to focus on ways to give students both content knowledge, as well as pedagogical content knowledge" (p. 4).

In recent years, several empirical efforts have been made toward studying and understanding the concept of pedagogical content knowledge and its role in teaching physical education. A pioneer investigator in this line of research, Rovegno, (1990, 1991, 1992a, 1992b, 1993, 1994, & 1995) attempted to describe the status and development of pedagogical content knowledge of preservice teachers and the role it played in their teaching practices. Additionally, studies by Graber (1995), Fortin, (1993), Rink, French, Lee, Solmon and Lynn, (1994), Rosenberg (1990), and others indicated that the amount and nature of pedagogical content knowledge influence teachers' understanding and instructional practices in physical education. However, the conception of pedagogical content knowledge, its role, and its manifestation in physical education teaching practices is in need of further empirical investigation.

Statement of the Problem

The purpose of this study was to describe and examine two experienced teachers' pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions and practice of teaching. The goal was to provide descriptions of experienced physical education teachers' classes teaching volleyball to students in different classes. The focus was on the instructional tasks and how they were presented to students.
Research Questions

1. What instructional practices do experienced physical education teachers employ in teaching the target content (i.e., volleyball)?
   1.1. What is the nature of the content and how is it structured and delivered through learning tasks?
   1.2. How do the teachers communicate the tasks to the students and interact with them?

2. What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

Significance of the Study

Shulman (1986) argued that pedagogical content knowledge is the form of knowledge that most clearly defines the special body of knowledge teachers possess and use to teach subject matter to students in ways that they understand and learn. Moreover, Brophy (1991) stated that "information about teachers' pedagogical content knowledge and related knowledge and beliefs will be needed about each major topic taught in schools..." (p. 362). This study investigated teachers' pedagogical content knowledge and their pedagogical theories of content as described by the teachers and manifested in their teaching practices in physical education teaching environments. It is hoped that this study will contribute to a better understanding of the role of pedagogical content knowledge in teaching and that it will offer an empirical base on which further studies may develop. If pedagogical content knowledge and its manifestation in the classrooms are what distinguish teachers from other professionals and make them unique and experts in their field, (Siedentop, 1989; Shulman, 1987), then this study was a worthy undertaking and more examples should follow.
Limitations of the Study

This study was limited in terms of the number of subjects and their selection. Two teachers participated in the study and the results will apply only to these subjects. Due to their selection as experienced and learning-oriented teachers working in suburban schools, the results of the study may not generalize to other teachers or settings.

Another limitation of the study concerned the content the teachers taught to their students. The teachers were studied teaching the same content (i.e., volleyball). Consequently, the teachers' pedagogical content knowledge and theories of the target content might not be generalizable to other content areas.

Definition of Terms

**Content Knowledge**: Knowledge of "the technical aspects of the skills involved [in a specific sport], the strengths and weaknesses of various strategic approaches to the sport, the training implications for improved performance within the sport, the developmental considerations, the norms, values, and traditions of the sport and the role it does and should occupy in local and national sport cultures, and developing technologies within the sport, and the psycho-social considerations associated with individual and group dynamics of players, and the ethical/moral dilemmas posed by competition" (Siedentop, 1989, p. 12).

**Instructional Representations**: Demonstrations, examples, or analogies the teachers use to present content to students, describe the tasks, and provide feedback.

**Instructional Task**: Learning activities teachers assign to students related to content taught.
**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 that guide teachers' managerial and instructional practices intended to promote specific student learnings.

**Pedagogical Theories of Content:** The teachers' pedagogical values (principles and beliefs that guide teachers' actions) about a particular content when teaching it to students (Doyle, 1992).

**Teacher Interactions:** Teachers' verbal or non-verbal exchanges with the students during the lesson.
CHAPTER 2
REVIEW OF LITERATURE

The purpose of this chapter is to provide a review of literature focused on related research and theory on the concepts of pedagogical content knowledge and theories of content. The review of the literature is divided into four sections. The concept of pedagogical content knowledge is introduced and explored in the first section. In the second section, research studies conducted in the general education field are described. The third section provides an account of empirical studies in physical education settings. The final section presents and discusses teachers' pedagogical theories of content and their role in teachers' practices.

Overview of Pedagogical Content Knowledge

Research in teaching in recent decades has produced important findings generating a knowledge base for teaching. The increasing body of empirical work regarding teachers' knowledge and practices has helped to differentiate among various types of teachers' knowledge and expanded the conceptual and practical approaches to the study of teaching. As Feiman-Nemser and Floden (1986) noted, "Understanding the organization of teachers' knowledge refines our appreciation of uses by showing how different forms of knowledge permit different kinds of performances" (p. 513). To better understand and describe teachers' knowledge, several attempts have been made to organize it into separate categories and models. Shulman (1987), in his article "Knowledge and
Teaching: Foundations of the New Reform," itemized the knowledge base providing an organizing theoretical framework of teachers' knowledge. He classified teachers' knowledge into seven distinct categories: content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts, and knowledge of educational ends. Among these forms of teacher knowledge, 'pedagogical content knowledge' has received most attention from educational researchers. According to Shulman (1986), pedagogical content knowledge

... embodies the aspect of content most germane to its teachability. Within the category of pedagogical content knowledge I include, for the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations -- in a word, the ways of representing and formulating the subject that make it comprehensible to others... [It] also includes an understanding of what makes the learning of specific concepts easy or difficult: the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning. (p. 9)

In plain terms, pedagogical content knowledge means knowledge of how to teach a particular subject matter. "It represents the blending of content and pedagogy ..." (Shulman, 1987, p. 8). 'Content' in pedagogical content knowledge concerns the organization of the subject matter while 'pedagogical' refers to instructional and management techniques utilized for the transmission of content knowledge (Gudmundsdottir, 1987). Pedagogical content knowledge implies the adaptation of subject matter knowledge to the characteristics of the learners for pedagogical purposes (Shulman, 1986, 1987). At another level of sophistication, pedagogical content knowledge refers to the particular knowledge teachers possess about how to teach specific subject matter, knowledge of curricular materials and their structure in content area, knowledge of instructional processes or strategies for teaching particular subject matter, and
knowledge of students' understanding of subject matter (Grossman, 1989; Marks, 1990; Wilson, Shulman, & Richert, 1987).

While the 'pedagogical' component of the equation has very often been the focus of studies in the teacher effectiveness research, interestingly, the 'content' component has not (Carter, 1990; Feiman-Nemser & Floden, 1986; Loewenberg-Ball & McDiarmid, 1990; Shulman, 1986). In addition, "the nature of the relationship between pedagogical and content knowledge has evaded researchers on teaching" (Gudmundsdottir, 1991, p. 265). Shulman (1986) referred to subject matter as the 'missing paradigm' in educational research. The basic argument was that teachers' subject matter knowledge affects their efforts to help students learn subject matter. Based on the conviction that teachers' forms of subject matter representation reflect not only theirs but also their students' knowledge and understanding of subject matter, Shulman and his colleagues initiated a line of research which has in the recent years evolved as a major research endeavor.

The term pedagogical content knowledge originated from other types of knowledge, for example, content or subject matter knowledge and general pedagogical knowledge. There is no doubt that a central task of a teacher involves exploring and communicating subject matter. This requires knowledge of the subject matter which "does not exist independently of the deeper structures of a discipline" (Grossman, Wilson, & Shulman, 1989, p. 29). These structures are referred to as substantive and syntactics structures (Grossman, et al., 1989). Substantive structures of a discipline include facts, concepts, principles, and ideas of a domain and the relationship(s) among them. Syntactic structures of a discipline, on the other hand, refer to the knowledge of the methods of inquiry a discipline employs to generate and evaluate new
knowledge (Grossman et al., 1989; Kennedy, 1990; Wilson, et al., 1987). While acquisition of substantive knowledge will help teachers explain, represent, and use examples to meaningfully communicate subject matter to students, acquisition of syntactic knowledge will help teachers learn new information and critically evaluate new theories and interpretations in their fields (Grossman, et al., 1989). Teachers' knowledge, or lack of knowledge, of the subject matter is critical not only in selecting structuring and teaching it, but also in developing pedagogical content knowledge (Grossman, 1990; Grossman et al., 1989; Gudmundsdottir, 1987; McDiarmid, Ball, & Anderson, 1989; Shulman, 1986; Wilson, et al., 1987).

Even though knowledge of subject matter is critical to transforming it, its mastery is not a sufficient condition for meaningful and effective teaching. To this end, as well as for pedagogical content knowledge to develop, general pedagogical knowledge is required as well. General pedagogical knowledge usually refers to all these theories, principles, practices, and processes underlying teacher behaviors during actual teaching, as well as knowledge of learners (Doyle, 1990; Wilson, et al., 1987).

**Pedagogical Content Knowledge in General Education**

In the field of general education several studies examined the existence or nature of pedagogical content knowledge. In this section a sample of such studies from different disciplines - English, Social Studies, Mathematics, and Geography - are reviewed.

Gudmundsdottir (1987) conducted a study to describe how beginning teachers bridge the gap between the discipline they studied in college and the high school subject they had to teach. The subjects were two young
anthropologists who were learning to become teachers. Data were collected for a period of 12 months, during which the subjects participated in a teacher education program. Interviews, observational data, and documents were the data sources. The subjects were interviewed seven times in planning cycles. These cycles consisted of pre-observational interview, observation, and post-observational interview. It was found that the subjects in this study initially based their teaching on their syntactical structures of their discipline and tried to restructure the content and make it pedagogical. This process of restructuring resulted in the development of pedagogical content knowledge and was facilitated by the professional preparation program (Gudmundsdottir, 1987).

Gudmundsdottir (1990b) designed a study to describe and compare the pedagogical content knowledge of experienced and novice social studies teachers. More specifically, the study investigated how two novice social studies teachers and two experienced teachers used the idea of a story to create meaning in the curriculum they taught. Findings of the study showed that there were differences among the four teachers in expertise and curriculum style in curriculum story making. The curriculum stories that the two experienced teachers used were economical and powerful in their nature. They were economical since they enabled the teachers to hold in mind large items of information. According to Gudmundsdottir (1990b),

... this is important, because in teaching good stories simplify the steps teachers need to take in processing information to show students how ideas or events are related to a larger set of issues. The curriculum stories are powerful because they enable teachers and their students to connect ideas and facts that on the surface seem to have very little in common. Powerful stories enable teachers to move back and forth between classroom activities and their story to illustrate a point and move the story plot along (p. 116).
It was also found that the experienced teachers' curriculum stories had a central idea which was strong enough to shape the events that contribute to the plot of the stories. The novice teachers' stories did not have this element. Based on the findings of the study, the investigator concluded that "curriculum stories help teachers manage complex ideas and make them accessible for students" (p. 117).

The curriculum stories were central to the pedagogical content knowledge of the two experienced teachers. The novices teachers, however, were in the process of building their pedagogical content knowledge. "Their attempts at storymaking and storytelling demonstrate the importance of their content knowledge in the development of pedagogical content knowledge" (p. 117).

In another study Gudmundsdottir (1991) used a case study methodology to describe the pedagogical content knowledge of an excellent high school English teacher who had 20 years of teaching experience. Data collection strategies included: 5 transcribed interviews, 20 transcribed classroom tape recordings, field notes of 20 observations, and documents. Results of the study showed that the teacher had a model of English, where she broke reading skills into levels/categories, which she used extensively during the teaching and learning process. The model was a hierarchical one "where interpretation begins with category one questions and then moves to categories two and/or three" (p. 416). The teacher used the specific model to enhance her own literary experience when reading all types of literature and she also used it in all her teaching of literature, no matter what type of class or kind of text. The teacher seemed to have analyzed the broad skills needed for reading and interpreting literature and managed to incorporate them in a model which she employed during her teaching. The ideas of the model originated in the classroom throughout her 20 years of experience. The investigator concluded that the teacher's "pedagogical
model of the subject matter she teaches is the centerpiece of her pedagogical content knowledge and influences all aspects of her teaching" (p. 416).

Grossman (1989) also used a case study methodology to describe the role of subject-specific components of teacher education in the development of pedagogical content knowledge. Her design involved six case studies of first-year English teachers. Three of the subjects had attended a teacher education program which emphasized strong subject-specific preparation in the teaching of English. The other three had not attended any teacher preparation program, but were well prepared in their subject and had elected to enter teaching. Three of the subjects taught in suburban public schools and three in independent schools. Two of the subjects taught in the same school and the fact that one teacher had and the other had no teacher preparation experience allowed for cross-case study analysis. All of the subjects taught high school students. The investigator interviewed the subjects five times and observed five of the six teachers for one unit of instruction. In addition she interviewed the subjects before and after the period of observation. Additionally, data included interviews with the professor who taught the curriculum and instruction course and the supervisors of the program, as well as hand-outs, syllabi, readings, and student work from the courses they had taken.

The analyses of the data showed that the two groups of teachers differed in curricular choices. The teachers without formal teacher education planned to organize their course around literature while the other group organized the course around writing. The teachers without teacher education based their choices on their knowledge of literature while the teachers with formal pedagogical background based their choices on what they knew about their students. In addition, the group of teachers without teacher preparation had
difficulty anticipating students' previous knowledge, held high student expectations, and did not easily adjust the content to students' needs. On the other hand, the graduates from the teacher education program anticipated better the students' needs and interests and exhibited instructional behaviors that fitted students' understanding. The investigator pointed out the importance of the educational courses which helped the teachers not to generalize from their own experiences to students.

Carpenter, Fennema, Peterson, and Carey (1988) investigated 40 first-grade teachers' pedagogical content knowledge of children's solutions of addition and subtraction word problems. The investigators used a highly structured problem-solving framework for analyzing teachers' pedagogical content knowledge. On the basis of that analysis, the researchers examined the status of teachers' pedagogical content knowledge and the relationship between their knowledge and student achievement. The strategies used for collecting data in this study were mostly quantitative. In measuring the teachers' knowledge, the researchers divided the teachers' knowledge in three major categories and: a) teachers' knowledge of distinctions between problem type, b) teachers' general knowledge of the types of strategies children used to solve different problems, and c) teachers' ability to predict the performance of specific students in their classes on different problems. Four instruments were used in collecting data regarding the teachers' knowledge. In addition, the investigators administered two performance tests to all students in the participating teachers' classes.

Results indicated that most teachers in the study were successful in identifying many of the critical distinctions between problems and the main strategies their students employed in solving addition and subtraction.
It was also indicated that the teachers' knowledge generally was not organized into a coherent network that related differences between problems, children's solutions, and problem difficulty to one another. That most of the teachers did not focus on these relationships was not surprising since it took researchers many years to specify them clearly. Carpenter et al. (1988) also found that the teachers' knowledge of whether their own students could solve different problems was significantly correlated with student achievement. The teachers' ability to predict the strategies that their students would use was not correlated with any of the two achievement measures used in the study.

Marks (1990) interviewed six experienced and two novice fifth-grade teachers of mathematics. One of the purposes of the interviews was to describe pedagogical content knowledge in mathematics. His analysis of the interviews revealed that pedagogical content knowledge consists of four elements highly integrated. The four elements were: a) subject matter for instructional purposes, b) students' understanding of the subject matter, c) media for instruction in the subject matter (i.e., texts), and d) instructional processes for the subject matter (Marks, 1990, p. 4). Marks (1990) suggested that there were instances in teaching mathematics where adaptation of general pedagogical principles to particular subject matter contexts occurred. He used the term "content-specific pedagogical knowledge" to characterize the case (p. 7).

A study in mathematics secondary education designed by Even (1993) examined teachers' subject-matter knowledge and its interrelations with pedagogical content knowledge related to two essential features of the concept of function, arbitrariness, and univalence. This study had two phases. The goal of the first phase was to gain a general picture of the prospective teachers' subject matter knowledge and pedagogical content knowledge. The second phase aimed
at clarifying this picture and adding more details. Participants in the study were 162 prospective secondary mathematics teachers. Data were collected in two phases. More specifically, a questionnaire was administrated to 152 prospective teachers who participated in the first phase of the study. Ten subjects participated in the second phase in which they completed the same questionnaire and were interviewed in depth.

Results of the study showed that many of the subjects did not have a modern conception of function. Also, they were missing an appreciation of the arbitrary nature of functions, and very few prospective teachers could explain the importance and origin of the univalence requirement. This limited conception of function influenced the subjects' pedagogical thinking. It was also found that when explaining functions to students, many prospective teachers used their limited concepts image and tended not to employ modern terms. Furthermore, many of those prospective teachers chose to provide students with a rule to be followed without concern for understanding.

Based on the findings, Even (1993) concluded that "an important step in improving teaching should be better subject-matter preparation for teachers. ... Teachers need to have learning environments that foster powerful constructions of mathematical concepts" (p. 113). In addition, Even (1993) pointed out 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).

Ormrod and Cole (1996) conducted a study to assess the effectiveness of the Alliance Summer Geography Institutes (ASGI) model in promoting both content knowledge and pedagogical content knowledge of participating teachers.
The study focused on nine 2-week summer institutes in seven states. The institutes were for teachers with minor or no background in geography and aimed at enhancing participants' content knowledge and pedagogical content knowledge. Eight of the institutes had 22-30 participants and the ninth had 39 participants. Most of them had very little coursework in geography or geography education.

Data collection strategies included: a) on site questionnaires which solicited impressions regarding the usefulness of content and strategies presented each week; b) follow-up questionnaires which included questions addressing perceived strengths and weaknesses of the institutes, specific changes teachers made in the subject matter they taught or pedagogical methods used, etc.; c) telephones interviews of a random sample which included questions similar to the follow-up interviews; d) on-site inservice evaluations which included questions related to the clarity and organization of the presentations, etc.; and e) follow-up questionnaires for inservice participants which included questions regarding whether if the teachers made changes in their teaching practices. Results indicated that the quality of the nine summer institutes were very positive. The strengths of the institutes were more than the weakness. Data also showed that the summer institutes had the impact they were designed to have. The majority of the participants who returned the follow-up questionnaire reported that they made changes both in what they teach in geography and how they teach it. The investigators indicated that "the changes in classroom practice that respondents described reflected sophistication in pedagogical content knowledge" (pp. 39-40).

Ormrod and Cole (1996) concluded that "our data clearly indicate that a 2-week summer institute can be an effective way of enhancing teachers' content
knowledge and pedagogical content knowledge" (p. 40). However, the investigators pointed out that "our data are derived solely from self-report instruments. It is possible that some of our respondents told us what they thought we wanted to hear rather than what actually transpired in their classrooms" (p. 41).

Pedagogical Content Knowledge in Physical Education

The concept of pedagogical content knowledge, although almost unexamined in the field of physical education, can be considered a promising line of research. Prominent physical education teacher educators have recognized the educational importance and value embodied in pedagogical content knowledge. Siedentop (1989), for example, stated that "Pedagogical content knowledge is the 'main stuff' from which effectiveness and expertise in teaching and coaching derives" (p. 2). Moreover, Rink (1990), commenting on future research efforts for professional preparation, noted that:

What is clear is that research efforts to understand teaching can no longer disregard the role of content in the design of studies and teacher preparation programs must begin to focus on ways to give students both content knowledge, as well as pedagogical content knowledge. (p. 4)

Apparently, teacher educators should consider pedagogical content knowledge as a useful concept. To be able, however, to use it appropriately and effectively, studies that will address the concept in various content areas in physical education should be undertaken. Because of the distinct nature of the physical education content, simple adoption of the concept, the findings, and implications from research in general education may not be appropriate.

Little empirical evidence exists today in the physical education pedagogical content knowledge literature. In this section research studies which
took place in the physical education are reviewed. In recent years, a line of research on pedagogical content knowledge in physical education was conducted by Rovegno.

To establish how prospective teachers restructure knowledge, Rovegno (1991) described what seven students learned during a field-based elementary physical education methods course and how their knowledge developed. During the semester the preservice teachers discussed aspects of what they learned and how they learned it. Data collection strategies included: field notes, informal interviews, formal interviews (3 with each student), and documents (lesson and unit plans, dialogue journals, exams, class handouts, and class notes). Data were analyzed using interpretive research methodologies. Findings of the study showed that preservice teachers considered knowledge restructuring as a silent aspect of field-based learning. Participants in the study "portrayed the process of restructuring and their new ways of knowing as positive and welcome—their old way as inadequate" (p. 210).

Drawing from the same data base, Rovegno (1991) examined two other questions: a) what knowledge did the preservice teachers describe as salient? and b) how did this knowledge develop? Rovegno (1992a) interpreted from an ecological perspective, the development of pedagogical content knowledge in this study [which] meant coming to know content from the new perspective of a teacher and discovering the relations among teaching, content, how children learn, context, and individual teaching capabilities and goals (i.e., individual/task/environment relations). (p. 73)

Findings indicated that all seven participants considered the development of pedagogical content knowledge as a salient factor in learning to teach. Development of pedagogical content knowledge was described as increased differentiation in terms of individual/task/environment relations. Using the
individual/task/environment as the basic unit of perception, action, and learning, this study found that the way children learn, the preservice teachers' capacity to teach, and the ability to observe and teach movement content, played important roles in the development of pedagogical content knowledge. Based on the findings of her study, Rovegno (1992a) concluded that pedagogical content knowledge "functioned like a tool that was used in perception and action and developed with use" (p. 78). In addition, the investigator 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 seven student teachers were able to make careful plans for observing and teaching content, they "could not perceive economically how children were learning that content. Nor did they know how to efficiently prioritize attention, goals, or decisions. They all spoke about being overwhelmed and, at times, unable to adequately observe or act" (p. 80).

Rovegno (1992b) conducted another study to describe how preservice physical education teachers acquired content knowledge. In her study Rovegno defined "content knowledge" to be "what Shulman (1986) called curricular knowledge and pedagogical content knowledge" (p. 254). Participants in the study were eight seniors enrolled in a K-8 physical education program focused on a movement approach to elementary physical education. "Learning this approach necessitated the acquisition of new content knowledge that was both complex and often highly discrepant from the traditional physical education content and methods experienced in traditional K-12 sport oriented programs" (p. 254). Results from the study suggested that the participants used knowledge acquisition mechanisms to oversimplify content and attended to aspects of the
movement approach that were most relevant to novices' capabilities. The investigator noted that for these preservice teachers, "learning about content for use in field experiences was inextricably connected to learning to teach that content" (p. 261). She concluded that "content knowledge acquisition is a complex process that occurs over considerable time" (p. 262).

In a follow-up study Rovegno (1993) examined what and how K-8 physical education teacher education (PETE) majors learned about the movement approach. More specifically, this study focused on what and how PETE majors learned about a movement approach to game play/strategy and mechanisms of advanced knowledge acquisition that contributed to confusion about this topic. Participants in the study were 12 PETE majors. Field notes, informal and formal interviews, and documents were used for collecting data. Data analysis included analytic induction and constant comparison strategies. Results of the study revealed that PETE majors accurately and easily understood and applied many aspects of the movement education approach, but indicated some problematic aspects relative to their pedagogical content knowledge of game play/strategy. Based on the findings Rovegno (1993) suggested that "students may have benefited from more in-depth instruction about game play/strategy or instruction based on content analysis frameworks that put game play/strategy in a more central position" (p. 67). She went on to point out that "the need to simplify complex content is self-evident. The goal is to simplify temporarily in ways that foster continued learning or at the very least do not hamper acquiring a deeper understanding" (p. 67).

In continuing the delineation of the nature of pedagogical content knowledge, Rovegno (1994) conducted another study where she aimed to refine our understanding of how aspects of pedagogical content knowledge emerge
and persist in context. In this investigation, case studies of two student teachers' pedagogical content knowledge of task content and sequencing across an elementary games and high school sport units (i.e., basketball and volleyball) were examined. Data were gathered using participant observation methods, interviews, and documents. Findings of the study indicated that both student teachers in the elementary school tried to use informing, extending, and refining tasks. One of the participants used nine and the other four application tasks (i.e., modified games) designed to teach skills and strategies to children. Both of them consistently provided group and individual feedback to children. During the games both participants stopped the class to give instructions about skill and strategies and none of them allowed the pupils to just play games.

In the high school setting the two student teachers initially tried to use an approach similar to the elementary schools' sequence of informing, extending, and refining tasks. However, as soon as they started to interpret particular aspects of the high school culture, they quickly retreated to a "curricular zone of safety" which meant shifting to mostly application tasks with pupils playing games. At this stage, one of the student teachers did not use any feedback and the other one used individual feedback exclusively. "Both viewed this dramatic change in their approach to content as negative for pupils and for their education as teachers" (Rovegno, 1994, p. 272).

This study is unique for two reasons. First the investigator defined the nature of pedagogical content knowledge as "the student teachers' construction of meaning" (p. 272). Secondly the analysis, attempted "to refine our theoretical understanding by illustrating the situated nature of pedagogical content knowledge and showing how aspects of the school culture can come to constitute how teachers know content" (p. 272).
In a more recent study Rovegno (1995) examined one student teacher's pedagogical content knowledge and his decisions about task content and task progressions across an elementary and high school unit. The participant taught a nine-lesson volleyball unit for one third-grade and one fourth-grade class in a rural K-8 school. He was also observed teaching a 5-week, two to three lesson per week badminton unit for 11th and 12th graders in a rural high school. The content, organization, and progression of each task; the explanations, demonstrations, and feedback; and when it was possible, the children's verbal and motor responses were recorded in the form of field notes.

The investigator found that across the nine-lesson volleyball unit at the elementary school, the student teacher taught the bump, underhand serve, and modified volleyball games and used 3 informing tasks, 2 refining tasks, 1 extension task, and 18 application tasks. There were far fewer tasks taught in the high school badminton unit and the content was almost exclusively tournament play.

The participant in the study justified his content selection and decisions by referring to aspects of his pedagogical content knowledge of teaching volleyball and badminton, drawing upon his conceptions (knowledge) of how students learn, and how to divide and sequence skill and game content. It was found that his conceptions were related to two issues: a) the biomechanically efficient body position, and b) play game. Results indicated that the student teacher's conceptions and decisions "about teaching the biomechanically efficient body position and his progression from having learners practice isolated skills to playing games represent a molecular view of knowledge and learning. His conceptions and decisions about teaching games were somewhat more holistic" (Rovegno, 1995, p. 292).
One of the major questions asked in a study conducted by Rink, French, Lee, Solmon, and Lynn (1994) was related to the differences in knowledge structures between experts and teacher trainees. Twenty-four physical education teacher trainees from two universities were the subjects for the study. The "ordered tree technique" was utilized for the collection of data. The subjects were trained to utilize the technique, and were asked to express the concepts they could associate with effective teaching. Then, they were asked to organize the concepts into meaningful categories. The teacher trainees' categories were compared with those of the expert teachers' categories. According to the results, the experts displayed superior depth and organization of knowledge of structures. The importance of the study lies in the belief that awareness and understanding of the experts' knowledge structures can result in teaching novice teachers specifically to this understanding. This, in turn, may result in promoting teacher trainees' understanding of pedagogical knowledge.

Rosenberg (1990) conducted a study which focused on how individuals learn to teach the content of physical education, and how formal training and experienced affect acquisition of teaching knowledge. Subjects in the study were four formally trained and four untrained physical education teachers. All eight subjects had previously experience with volleyball. The subjects were first asked to view a volleyball lesson and talk about what was happening in the lesson as they were watching a video. Then the subjects viewed the lesson a second time and were interviewed regarding teaching knowledge. The source of data was the interviews. In order to evaluate pedagogical content knowledge of the subjects, Rosenberg (1990) established six criteria which were: "(1) proper technique, (2) common performance error, (3) correction procedures, (4) learning progression, (5) developmental levels, and (6) appropriate practice activities" (Rosenberg,
1990, p. 42). Results revealed that formally trained teachers exhibited a greater alertness for general teaching principles, while the untrained teachers directed their attention mostly toward content. One of the conclusions was that the lack of pedagogical knowledge of the untrained teachers may have a negative impact on the development of pedagogical content knowledge.

Fortin (1992) examined the pedagogical content knowledge of two experienced dance teachers in an academic/half professional setting. The central focus of the study concerned the way the two experienced dance teachers think about the teaching of modern dance and the relationship of this to their teaching practice. Data collection sources included: observations, semi-structured interviews, stimulated recall, documents, students' questionnaires, and reflective journal. Data were analyzed inductively using case study methodology. Findings of the study indicated that although the two teachers have been through formal study of movement sciences, their well organized body of knowledge resulted from the blending of dance and different subject matters peripheral to the discipline of dance. The investigator found that "the two teachers were not taught to organize their content knowledge the way they did. In these two cases, pedagogical content knowledge is highly idiosyncratic. ... [The two teachers'] knowledge and beliefs about dance teaching were deeply rooted in their own biographies" (p. 272).

Results of the study also revealed that the two participants represented their content knowledge through a series of tasks related in a meaningful way. Both teachers were able to explain what content was manifested within the tasks and why the content was important. Fortin (1992) concluded that "having proficient content knowledge background is a necessary but not sufficient condition for having pedagogical content knowledge (p. 276). Based on the
findings, the investigator indicated that the two teachers "had the capacity to expertly transform their content in a variety of instructional representations. A wide repertoire of instructional representations is a central feature of pedagogical content knowledge since it allows for adaptation to different learners and teaching situations" (p. 276). Fortin (1992) found that the two teachers' "conceptual content knowledge, informed mainly by body therapies and movement sciences, assisted them to develop a wide repertoire of instructional representations. They had abstract theory that could be applied to a variety of situations. They were able to generate metaphors, alternative explanations, and clarifications of the same principles" (p. 276).

Fortin (1992) also indicated that beside having a proficient knowledge base, the wide repertoire of instructional representations of the two teachers was related to their teaching experience. Both teachers "were free-lance teachers who developed instructional representations over time as a result of experience in many different settings. As free-lancers they had many occasions to tailor the representation of their content knowledge to different groups of students" (p. 277). Based on the two case studies Fortin (1992) concluded that "teaching can be understood and enacted from different orientations, which derive from a proficient knowledge base and from accumulated wisdom of practice, wisdom that has emerged during experience with many students in many settings" (p. 277).

Chen and Ennis (1995) examined how teachers transform content knowledge in the process of making curricular decisions in physical education. Participants in the study were three middle-school master physical education teachers whose teaching experience ranged from 14 to 32 years. The investigators collected data using participant observation, formal interviews,
knowledge importance evaluation, and the Pathfinder concept mapping. Volleyball was chosen as the content knowledge base for the students because it was the instructional unit taught by the teachers. Results of the study indicated the content was similar to all three schools and consisted of basic skills and knowledge of volleyball. The three teachers covered the bump, set, underhand serve; basic rules taught included the scoring system, side-out, and position alignment (zones). None of the participants taught game strategies or patterned play. It was also found that although the teachers operated from a common content knowledge base, their pedagogical content knowledge was idiosyncratic in nature. Additionally, it was found that the enacted curriculum was linked to the teachers' pedagogical content knowledge base. Finally, the teachers' curricular decisions were based on their perceptions on student learning capacities.

Walkwitz and Lee (1992) conducted a study attempting to gain insight into the nature of pedagogical content knowledge in physical education. The main focus of the study was on how knowledge veteran teachers have about the mechanical aspects of throwing is transformed and used during classroom instruction. Participants in the study were eight kindergarten classroom teachers with high generic teaching skills competence. Four of the teachers were randomly assigned to a 4-hour knowledge training program. The other four teachers served as a comparison group and did not receive any training. All teachers subjects taught a 6-week overhand throwing unit to their intact classes. The teachers were videotaped three times during the throwing unit and a stimulated recall interview conducted after every videotaped lesson. The stimulated recall data were used to describe and compare the thoughts and knowledge concepts expressed by the two groups of teachers. The throwing
practice experienced by the students in all eight teachers' classes were analyzed for frequency of opposite foot stepping.

Findings of the study indicated that the knowledge gained during training was associated with different patterns of skill observation. The knowledge concepts the teachers acquired during the 4-hour knowledge training program formed the basis of many of their thoughts and were reflected during the instructional procedures. Students in the knowledge-trained teachers' classes demonstrated more than twice as many opposite foot throws during the unit than students who were in the comparison teachers' classes.

Barrett and Collie (1996) designed a study to describe pedagogical content knowledge discovered within the context of children learning lacrosse from experienced teachers learning to teach a new unit of instruction. More specifically, participants in the study were four physical education teachers who had no experience in teaching lacrosse but they participated in an 8-hours workshop on lacrosse taught by the investigators. The participants' teaching experience ranged from 3-12 years. The source of data were 16 videotapes from subsequent lessons taught by the four teachers to their 4th and/or 5th graders. The analysis focused only on the students' movement patterns and teachers' actions related to the vertical cradle, one of the four skills taught during the entire unit. Data analysis included inductive strategies and constant comparison.

The investigators interpreted the findings based on a theoretical model consisting of three concepts: a) developmental sequences, b) the 3-factor constraint theory (i.e., interaction among organism, environment, and task characteristics), and the idea that the learning situation can be set in such a way as to elicit the desired response. To judge qualitative changes in student
performance of the vertical cradle in relation to teacher actions, the researchers
developed a hypothesized developmental sequence of the skill of cradling
consisting of seven components each of which had several steps.

The investigators presented their findings in terms of links between
student movement patterns and teachers' actions concerning the teaching and
learning of the cradling technique. These links were interpreted as representing
the teachers' pedagogical content knowledge about the particular lacrosse skill.
In synthesizing the findings from their study, Barrett and Collie (1996) concluded
that the teachers with pedagogical content knowledge specific to lacrosse and
particularly to the skill of cradling should be able to help children learn the skill
by taking advantage of, a) the natural opposition of arms and legs when running,
b) the influence of their running speed on the range of movement, and c) the
important role played by the stick positions, top-hand grip, hand placement, and
available space. They stated that, if students are to progress toward the more
advanced stages of performing the vertical cradle, their teachers need to be able
to use effectively their pedagogical content knowledge specific to lacrosse. When
considering the theoretical framework in light of these findings, the researchers
suggested that teachers should use their pedagogical content knowledge to
observe and recognize the effect of the relationships and interactions among the
developmental characteristics of the learner, the environment, and the features of
the task have on the children's movement patterns, and when necessary, change
the task and/or the environment to elicit the desired student outcomes.

Kutame (1997) examined the influence of teachers' content and
pedagogical content knowledge on student acquisition of the cartwheel.
Participants in the study were seven experienced elementary physical education
teachers. A total of 16 lessons, ranging from fifteen to thirty minutes long, were
taught by the seven teachers. Data collection included systematic observations, field notes, semi-structured interviews, and a survey. Data were analyzed using a cross-case methodology. Findings showed that there were differences among the teachers' content knowledge of the cartwheel. In terms of the participants' pedagogical content knowledge of the cartwheel, it was found that the teachers were more alike than different. Kutame (1997) found that there was a relationship between teacher pedagogical content knowledge and student learning, since student learning seemed to be mediated by teachers instructional practices. "When the teachers knowledge was strong the students were most successful in learning the cartwheel, but when the teachers knowledge was weak, the students were less successful" (p. iii).

Teachers' Pedagogical Theories of Content

In their historical review article, Clark and Peterson (1986) classified teachers' thought processes into three categories: a) teacher planning, b) teachers' interactive thoughts and decisions, and c) teachers' theories and beliefs. The authors pointed out that the third category, teachers' theories and beliefs, "represents the rich store of knowledge that teachers have that affects their planning and their interactive thoughts and decisions" (p. 258). Discussing the term "theories of professional practice" Argyris and Schon (1974) stated:

Theories of professional practice are best understood as special cases of the theories of action that determine all deliberate behavior. ... Theories are theories regardless of their origin: there are practical, common-sense theories as well as academic or scientific theories. A theory is not necessarily accepted, good, or true; it is only a set of interconnected propositions that have the same referent -the subject of the theory. Their interconnectedness is reflected in the logic of relationships among propositions: change in propositions at one point in the theory entails changes in propositions elsewhere in it. (pp. 4-5)
Evidence in the literature suggested that teachers have theories about the students, curriculum, pedagogical methods, and subject matter (Clark & Peterson, 1986; Doyle, 1992; Fang, 1996; McNamara, 1991; Shulman, 1987). Ross, Cornett, and McCutcheon (1992) emphasized that there is a general agreement among the educators that "teachers' personal theories and beliefs serve as the basis for classroom practice and curriculum decision making, yet the nature of this relationship is not well understood" (p. 3).

Clark (1988) indicated that teachers' theories "affect perception, interpretation, and judgment and therefore have potentially important consequences in what teachers and students do and say" (p. 7). Pajares (1992) also pointed out that the theories teachers hold "influence their perceptions and judgments, which, in turn, affect their behavior in the classroom" (p. 307).

Nespon (1987) observed that:

In spite of arguments that people 'beliefs' are important influences on the ways they conceptualize tasks and learn from experience, relatively little attention has been accorded to the structures and functions of teachers' beliefs about their roles, their subject matter areas as they teach, and the schools they work in. (p. 317)

An issue that has not been empirically addressed within the pedagogical content knowledge literature is the role of teachers' theories of content in their practices. Gudmundsdottir (1990a) pointed out that "one important area of values in education that has been ignored in most educational research is teachers' conceptions of the subject matter they teach" (p. 46). Doyle (1992) also indicated that "teachers have their own curriculum theories which influence in profound ways the experienced curriculum. More attention needs to be given to these theories of content and how they are shaped by classroom experiences" (p. 499). According to Doyle (1992), evidence suggested that "teachers have very
robust theories of content that they use to author and direct curriculum events in classroom. We are only beginning to understand the nature of these content theories and how they are acquired and shaped by experience” (p. 509).

In a recent review article on teacher beliefs and practices Fang (1996) pointed out that the emphasis of studies on teachers' thought processes has been on teachers' decision-making with limited reference to the knowledge of subject matter that these decisions are based. In addition, Fang (1996) stated that researchers almost neglected teachers' theories of subject matter or the role these theories may play in planning, interactive process of teaching, and student learning.

Gudmundsdottir (1990a) reminded us that pedagogical content knowledge has two major components, content and pedagogy. According to Gudmundsdottir (1990a):

The content in pedagogical content knowledge has to be reorganized to take into consideration students, classrooms, and curriculum. This reorganization revolves around teachers' personal values and those embedded in their specialization. Thus, in pedagogical content knowledge, content does not stand in isolation. Indeed, the unique quality of pedagogical content knowledge is "that special amalgam" of pedagogy and content, especially among experienced teachers. To teach an orientation involves adopting some teaching methods and rejecting others. This means that teachers will develop a repertoire of teaching methods that they believe are tune with the ideas they believe are important for students to learn. (p. 47)

In a review of the literature on pedagogical content knowledge, Grossman (1991) presented a model of pedagogical content knowledge which emerged from studies of knowledge growth among beginning secondary teachers. This model included the following four components: a) conceptions of the purposes for teaching particular subjects; b) knowledge and beliefs regarding students understanding; c) curricular knowledge; and d) knowledge of instructional
strategies and representations for teaching specific topics. The most relevant component of the pedagogical content knowledge model in this section of the review of the literature is the first component and the discussion will focus only on this component.

According to Grossman (1991) conceptions of the purposes for teaching a particular subject:

- include teachers' beliefs about what is most important for students to know, understand, and appreciate about specific content, and their understanding of the interrelationship of topics within a subject. These conceptions act as a template for teachers' decision making about what to teach, what text to use, and what to emphasize within a course. (pp. 209-210)

Reporting findings from several studies on teachers' conceptions, Grossman (1991) concluded "that secondary school teachers' conceptions of the purposes for teaching a subject are organized into pedagogical models or imagery; these models in turn inform instructional decision making" (p. 210). Fang (1996) summarizing studies on teachers' theories and practices, indicated that the most significant contribution to our understanding of this area, have in recent years taken place in the field of reading/literacy. Fang (1996) pointed out that "a substantial number of such studies [on reading] support the notion that teachers do possess theoretical beliefs towards reading and that such beliefs tend to shape the nature of their instructional practices" (p. 52).

Wilson (1988) also found that teachers' theories of content influence both what they teach and how they teach it. Gudmundsdottir (1990a) suggested that teachers' orientation to the subject matter "is central when teachers restructure their content knowledge to create pedagogical content knowledge" (p. 46).

Analyzing data from four case studies, four excellent high school teachers - two taught American history and the other two taught English-, Gudmundsdottir
(1990a) found that the four participants in his study created pedagogical models of their subject matters. According to the investigator:

These models are the centerpiece of their pedagogical content knowledge and influenced all aspects of their teaching, from curriculum design to classroom interactions. ... The four models are 'homemade', because the teachers have developed them over the years. They differ because they represent each teacher's values in a unique and personal way, and at the same time the models are a pedagogical representation of the orientation to the discipline the teacher prefers (p. 47).

Chapter Summary

The studies reviewed constitute initial empirical efforts to explore the nature, character, certainties, or ambiguities about the concept of pedagogical content knowledge. The researchers engaged in studying pedagogical content knowledge focus on how teachers represent the subject matter and content knowledge, or on how they think about the subject matter in relation to other contextual influences. They are interested in exploring and describing the nature of the relationship between pedagogical and content knowledge as it relates to context. Studies that examined pedagogical content knowledge, compared beginning and experienced teachers, novices and experts, or beginning teachers with and without pedagogical courses in their background. Research methods typically used to study pedagogical content knowledge include interviews, class observations, stimulated recall, and document analysis.

The studies conducted in relation to pedagogical content knowledge in the different academic areas have established "pedagogical content knowledge" as one of the most powerful, yet intriguing concepts in pedagogy with direct application across all teaching settings. How well teachers know the subject matter of their discipline, and what ways they use to convey it to students may
be critical to good and effective teaching. The framework of knowledge base of teaching presented by Shulman seems that it can be used as a frame of reference for those who want to teach people how to teach, as well as for those who want to study the nature of teaching.
CHAPTER 3
METHODOLOGY

This study examined two experienced teachers’ pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions of content and teaching practices. The study utilized both qualitative and quantitative methods. This chapter will address the rationale for the choice of methods to investigate this topic and discuss the various aspects of the methodological procedures, including information about the subjects, settings, data collection, data analysis, and data trustworthiness.

Settings and Participants

Two elementary physical education teachers volunteered to participate as subjects for this study. Both teachers taught in suburban public schools in Central Ohio. A purposeful sampling procedure was used in this study because, as Patton, (1990) stated, "the purpose of purposeful sampling is to select information rich cases whose study will illuminate the questions under study" (p. 169). The participants were selected based on three criteria. The first criterion was teaching experience. Both teachers had more than five years of teaching experience in their respective schools. These teachers were identified by members of the advisory committee of this dissertation because they hold reputations as being good teachers. They had collaborated with a major physical education teacher preparation program in the area in the past and had extended experience in serving as cooperating teachers. Teaching experience was a
criterion because research indicated that experienced teachers are more likely to demonstrate pedagogical content knowledge in their teaching practices than beginning teachers (Dodds, 1994; Siedentop & Eldar, 1989).

The second criterion was that the teachers were willing to teach a common unit of instruction, (it turned out to be volleyball), to students in two different grades as part of their regular school curriculum. It was important for this study to examine teaching practices exhibited in two different grades by the same teacher while teaching the same content, because it would facilitate the examination of similarities and/or differences in content representations. The third criterion was that both schools were located in communities whose values of the content taught would be more similar than different. This would provide for more homogeneity of students' experiences with and interest in volleyball.

Both teachers who were selected were Caucasian females. Irene had 19 years of teaching experience. She had been teaching at her school for 15 years. She also had 4 years of teaching experience at the middle school level and four years coaching volleyball. Anna had 18 years of teaching experience, the last eight years teaching at the elementary school where the study was conducted. Prior to that she had been an elementary school teacher for five years and taught physical education for five years at a high school. She had no coaching experience in volleyball and considered volleyball as not one of her weaker units of instruction. The specific context in which they taught the volleyball units and their knowledge of and experience with volleyball is discussed in detail in chapter 4.

Entry

The investigator knew all of the participants in the study from his role as university supervisor of student teachers. He visited the teachers at their sites
and asked the teachers if they would be interested in participating in the study. Confidentiality and anonymity for teachers and schools were assured concerning the collection of data and dissemination of findings (teachers were given pseudonyms). Permission to conduct the study was provided from the principals of the schools and from the Human Subjects Review Committee at The Ohio State University.

Conduct of the Study

The nature of the research questions defined the research methods used for the collection of data in this study. The following multiple data collection techniques were utilized: formal and informal interviews, field notes, and systematic observations.

Formal Interviews

Each teacher was interviewed twice. The purpose of the first interview, which took place before teaching the unit, was to gain knowledge of the teachers' educational values about the content they would teach. Questions were designed to elicit information regarding the following themes: a) the teachers' personal participatory, teaching, or coaching experience with volleyball, b) what they appreciated most about the sport, c) what content (skills and strategies of the sport) they planned to cover during the instructional unit and for what purposes, and d) what they knew about the students and/or classes they would teach (see Appendix A).

The purpose of the second interview was to elicit from the teachers their assessment of the work accomplished and provide them with the opportunity to talk about issues or concerns concerning the particular unit and students' responses to the unit. As part of the interview, the teachers were asked to offer
their pedagogical reasoning regarding choices of content and their teaching behaviors during the instruction. The post-unit interview included questions reacting to what was stated during the first interview and what happened during the unit and was driven in part by my questions from observations and field notes (see Appendix B). All the interviews were semi-structured. They were audio-taped, transcribed, and analyzed.

**Informal Interviews**

Before and/or after the lessons, informal interviews were conducted to gather information about and justification for the specific purpose(s) of the lesson, the extent to which purposes were achieved and the practical dilemmas faced in teaching volleyball to their students. Data from these informal interactions were gathered as field notes, reviewed and analyzed.

**Systematic Observations**

All lessons for the volleyball units at both elementary schools were observed and videotaped. A total of 12 lessons (6 fourth- and 6 fourth and fifth combined-grade lessons) were taught by Irene and a total of 9 lessons (4 fourth-grade and 5 fifth-grade lessons) were taught by Anna.

The purpose of the systematic observation and analysis was to provide an accurate description of the structure and development of the tasks the teachers chose to teach the content. For the purpose of systematic observation, a modified task system observation protocol (Siedentop, 1991b) was used to code data from a permanent product, the videotape. The focus of this task system was on: a) what was the type of the motor tasks presented by the teacher to the students (e.g., a task may be informing (I), extending (E), refining (R), applying (A), etc.), and b) the length of time the students spent on motor tasks. All lessons taught by both teachers were coded using the modified protocol. The
modification to the task system protocol involved adding the following categories:

Initial Guided Practice Task (IGP): A task performed with the guidance of the teacher when a skill is introduced for the first time. There is no equipment involved and the teacher typically asks the pupils to visualize the use of equipment.

Reviewed Task (RT): A task that has already been introduced and practiced and is used for reviewing and practicing purposes.

Reviewed Guided Practice Task (RGP): A task performed with the guidance of the teacher for the purpose of reviewing an already taught skill.

Warm up Introductory Tasks (WIT): It refers to initial activities in a lesson that are related to the content of the unit and function as warm up or as a way to introduce some preliminary, content-specific skills.

Refining/Applying, or Refining/Extending (R/A, R/E): A task that could not be clearly classified as an extending or refining or applying because the task statement included a two-fold focus in that the description of the task descriptive elements that signified the presence of a twofold refining, extending, and/or applying focus.

In addition to coding all the lessons using the task system observation protocol, four lessons for each teacher, two for each class, were systematically coded in terms of the following teaching behavior categories: a) instruction (i.e., descriptions, explanations, teacher and/or students' demonstrations, and feedback), b) student practice, c) transition, and d) management. The purpose of this sample systematic observation was to capture how the teacher spend the allocated time in different teaching behaviors.
To obtain the reliability of the quantitative data, inter-observer agreement measures took place. Data collected through the modified form of Task Structure Observation System was checked by a trained observer. More specifically, 30% of the videotaped lessons were randomly selected for a test of inter-observer reliability. It was decided, before hand, to resolve any disagreements between the observers for an accurate account of the two teachers' instructional practices. Thus, the criterion level of agreement between observers was set at 100% agreement. During the coding process there was a total of four disagreements between the observers. These disagreements were resolved through a joint review of the segments of the videotapes where the discrepancies occurred and agreement was obtained on the those episodes.

Field Notes

Each lesson was observed and field notes were kept to generate a better understanding of the teaching practices and the learning environment of the physical education classes. For this purpose, the field notes attempted to capture a) the tasks characteristics, b) the nature and/or characteristics of the teacher descriptions, explanations, or demonstrations provided during the task presentation, c) the nature of teacher and student interactions during student practice, and d) the nature of student engagement during the tasks.

Field notes about the task characteristics focused on recording, a) the goal of the task (i.e., what and how the task was to be performed), and b) the organizational properties of the task, including the environmental arrangements for performing a task as well as performance related criteria. The environmental arrangements of the tasks addressed the conditions (e.g., number of students participating in a task, equipment used, space utilized, etc.) under which a task was to be performed. For example, if the goal of the task was to bump the ball,
the condition(s) could be individually in personal space using a beach ball.

Conditions of the task also included information about the procedural organization of the task and roles or responsibilities assigned to students for participating in a task. The second organizing theme for keeping field notes was related to the nature and/or characteristics of the teachers' descriptions, explanations, or demonstrations provided during the task presentation to the class. Field notes of this nature included cues or phrases the teachers used to describe the skills and/or tasks to the students, explanation provided, including examples, analogies, or metaphors, and teacher and/or student demonstrations used to represent content to the students.

The field notes also included descriptions of teacher interactions with the students during their engagement in the various tasks. Such notes included verbal, visual, or manual attempts the teachers made to inform students of their performance and enhance their learning and understanding of the content taught. The teachers' efforts to inform students about their performance and to help them improve their skills and/or understanding of the various aspects of the game constituted moments in their teaching that reflected their capacity to communicate content to students in ways that they could understand.

The fourth theme of the field notes focused on the students' performance in various tasks designed by the teacher. The field notes included description of the extent to which the students were successfully engaged on the tasks and performed them in ways that reflected understanding of the skill or game.

Data Analysis Procedures

Data collected were organized and analyzed depending on their source. The case and cross case method were used for the analysis (Patton, 1990; Yin 45
For the case analysis, a case record was created consisting of each participant's data from all sources. Data from the interview transcripts, the field notes, and the transcripts from the task statements were read and analyzed inductively looking for 'recurring regularities' or patterns (Patton, 1990). Data derived from the modified task structure observation system were tabulated in order to provide an objective picture of the frequency, duration, and types of tasks.

For the cross case analysis, the identified categories, themes or patterns from both case analyses were compared for commonalities and distinctions (Patton, 1990; Yin, 1989). These observations along with those derived from the analyses of the systematic observations were synthesized, interpreted, and discussed in order to contribute to the knowledge base about teachers' pedagogical content knowledge.

Trustworthiness

Trustworthiness, the process which the investigator employs to convince other researchers or readers that the findings are worthy of attention and valid for the context, (Lincoln & Guba, 1985; Patton, 1990), was established in this study by using three of the major strategies discussed in the literature: triangulation, member check, and peer debriefing.

Triangulation

Triangulation, a method that ensures the utilization of multiple data sources in a study (Glesne & Peshkin, 1992; Patton, 1990), was used as several data sources were considered in the study. More specifically, confirmation or disconfirmation of the data was obtained by triangulation of methods since
evidences from formal and informal interviews, and field notes were compared and contrasted to cross-check data and interpretations.

**Member Check**

Member check is a process of providing the data and interpretations to the participants of the study and asking them to justify and comment on the accuracy of the data or interpretations (Patton, 1990). All the interview transcripts were returned to the participants and they were invited to comment, clarify, elaborate, or suggest changes to their original responses. There were no substantive changes by the two participants but only minor editing and grammatical corrections. In response to their suggestions the editing and grammatical changes were made before the data analysis.

**Peer Debriefing**

Peer debriefing, the process of challenging and/or commenting on the data and interpretations (Lincoln & Cuba, 1985), was also employed in this study. Scheduled peer debriefing meetings were held with the head of the advisory committee for this study during the analysis and interpretation of the data. During these weekly meetings the discussion focused on methodological issues and analytic interpretations. In addition, a colleague was invited to read preliminary analyses and final case narratives and comment and/or challenge interpretations of the data and methodological procedures adopted during the analytic process.

**Summary**

Qualitative and quantitative methods were used in this study to provide a rich description of teachers' pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions and of teaching practices.
A case study methodology was employed in answering the research questions. Participants in the study were two experienced elementary physical education teachers. The main data sources were formal and informal interviews, field notes, and systematic observations. Data were analyzed inductively using interpretive strategies and were reported as case narratives. In establishing trustworthiness of the findings triangulation, member check, and peer debriefing strategies were used.
CHAPTER 4
RESULTS

The purpose of this study was to describe and examine two experienced teachers' pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions and practice teaching. The goal was to provide descriptions of experienced physical education teachers' classes teaching volleyball to students in different classes. The focus was on instructional tasks and how they were presented to students.

Two major questions and two sub-questions guided the study.

1. What instructional practices do experienced physical education teachers employ in teaching the target content (i.e., volleyball)?
   1.1. What is the nature of the content and how is it structured and delivered through learning tasks?
   1.2. How do the teachers communicate the tasks to the students and interact with them?

2. What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

This section presents the results for the two case studies. Each case study starts with general information about the context, the teacher, and the students. 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.
CASE ONE: Irene

General Information

The Teaching Setting

The school in which Irene taught physical education was located in a suburban area with lower-middle socioeconomic class characteristics in a large midwestern city. The population was, for the most part, white. The school was housed in a two-floor building, average in size, and in a relatively good condition. Irene taught in a multi-purpose room, nearly the size of a regulation volleyball court. According to her,

It [the gymnasium] would be the length about 62 foot long and maybe 30 foot width. Maybe 30 at the most. ... Because we get a volleyball court across there so that would be at least 30 but of course with the tables there I only have 30 feet to work with probably. (Post Unit Interview, pp. 30-31)

On one side of the room several lunch tables were stacked one next to each other limiting the size of the gymnasium available for teaching. There was a stage in the gymnasium part of which was used as the Irene's office space and part was used for storing physical education equipment. There were two doors in the room. When the students come for their physical education lessons, they would enter from one door and, when they would finish their lessons, they would exit from the other one as the next class entered the gymnasium through the first door.

Irene noted that the contextual limitations influenced some aspects of her teaching practices, including the choice of drills or tasks. For example, she expressed some concerns regarding the structure of her lessons as well as the learning time and safety of her pupils. She was certain, however, that even if she worked in a different school with larger facilities, the nature of her
programmatic progression would not change. The following interview extract highlights her view about these issues:

I don't think that I would change my progression... I think that I would still go with my same pattern of the movement and the development, and the sport. I think that progression I would stay with. What might change is that sometimes with my different drills... [Another] thing might be that I wouldn't have to pull into structure as often as I do. And I would prefer it if I didn't have to. I would prefer it if I could give each student a ball, say for volleyball, and say go to wall space and practice 25 underhand serves and then take two giant steps back and see if you can do 25 more. That would be real nice. I have no wall space where there isn't something stored and that makes it very, very difficult. So if I want to do serves against the wall, I have to do it in squad formation. I tried it several times where I used the little bit of wall space that I have and tried to use tables. Well, of course, the tables aren't high enough for serving so the balls were going over the tables. That was a futile attempt and I found out I'm really wasting their time, whereas, if I put them in little squads and we used the space we could go ahead and at least get some practice done. And, what they do is now they serve, the ball comes off the wall, they catch, and the next one serves. So it works okay but not as good as if I could have everybody having their own ball and getting a lot more time in. So I guess the constraints would be time, space, and safety. (Pre-Unit Interview, pp. 4-6)

The Teacher

Irene is an elementary physical education teacher in a public school. She started her professional career in a middle school and, four years later, transferred to an elementary school. Most of her teaching experience is at the same elementary setting. In describing her teaching experience she noted:

I have been teaching physical education for 19 years. I have been at the elementary level for 15 of those years and I was at the middle school for four of those years. (Pre-Unit interview, p. 1)

She transferred to the elementary school because her area of concentration during her undergraduate studies was elementary physical education and she wanted an opportunity to try to teach movement. As she stated, "movement was
something that I really liked and I knew that I would really only have the chance to do it the right way if I was at the elementary level" (Pre-Unit Interview, p. 1).

Irene found movement to be enjoyable. She did not think of herself as an athlete during the high school and college years, yet she described herself as an active participant in sporting environments. Competition did not function as an attractor for her involvement in sports. One of the aspects of participating in activities she enjoyed was the social environment the teams created. She stated that:

The movement itself is enjoyable for me. I want to say that I was not what you would say a phenomenal athlete as a high school student or as a college student. I participated in lots of sports in high school and participated in sport activities at the college level but I participated not so much because I loved competition but because I loved the movement and I loved every social aspect that was involved with movement and teams. (Pre-Unit Interview, p. 2)

Irene enjoyed teaching at the elementary level. Among the aspects of teaching she found particularly enjoyable were the opportunity to teach movement, working with children and enjoying their creativity, learning from them, and seeing the effect of her physical education program on their growth and development. She noted:

Positive aspects besides the movement would be the opportunity to work with children, and with doing movement with children the creativity is humungous. They come up with ideas that I never would think of and so they're always teaching me so I think that's a positive aspect for me. Another thing that is a positive aspect would be that the elementary level is that you have children from the time they're kindergarten, five years old and we have a core of students here that do stay for the entire five years and you do have an opportunity to see how your program works and how the skills develop and that it does work... [The] students that I do see from the time they're five years old till the time they're 11, I do see good progress and it makes me feel that we have been successful with the program here at [our school]. (Pre-Unit Interview, p. 2)
Learning skillful movement and joyful participation in movement experiences were at the heart of Irene's physical education program. As she stated, "I teach physical education [that] isn't just fun and games but we do want skills to come out of it. Fun and games are involved too but we want skills to come out of it." (Pre-Unit Interview, p. 7). For the kindergarten and first grades the focus of the program was on movement education, for second and third grades on the development of basic skills, while for the upper elementary grades, that is 4th and 5th grades, the focus was on using the basic skills in various lead-up games and team sports. Irene described the emphasis of her program as being on:

Movement and participation. In the upper grades, 4th and 5th it does become more skill oriented but still the main thing that I'm grading on, what I'm looking for, is that the child is participating and is active for the entire 45 minutes [of each lesson]. I'm always correcting and I want them to try to improve their skill but the participation is what is important for me, that they're involved in the activity and that I want them to enjoy it. That's the main part. Now like kindergarten and first grade children we work mostly with movement and big movement concepts, directions, levels, pathways, those kind of big ideas. Body shapes. And then, when we get into second and third grade, we get into more developmental skills and catching, throwing and really becoming a little bit more detailed about what I'm expecting from them, and then by the time they're in the 4th and 5th grade, if they've worked hard on those developmental skills, they should be ready to put those into their team sports and the different lead up games that we work with in the 4th and 5th grade and that's kind of the plan and I do think that it works. (Pre-Unit Interview, pp. 2-3)

In addition to teaching her pupils to become skillful movers and providing them with the opportunity to participate maximally in the physical education classes, Irene addresses fair play and fan behavior in her program. Because of her relatively small gymnasium, limited equipment and/or large classes, for example, her students, at times, have to take turns when participating in a
tournament. For Irene it is learning time, even during the time they are not actively involved in the game. Still maximum participation was always on her mind. She said that:

...with the team sports, I mainly use lead up games where I can have maximum participation... [But] sometimes, when we do a tournament, for instance, floor hockey, I do have students that are fans in the stands but then again they're learning because we talk about fan participation, fan behavior. Fan sportsmanship. And so it's a learning thing for them and they're in and out. The games are five minutes so they're only resting five minutes and then they're back into activities so it works pretty well; but again, maximum participation is the big issue for me. (Pre-Unit Interview, p. 16)

The Volleyball Unit

This study was conducted when the teacher taught a volleyball unit to two classes, a fourth grade class and fourth and fifth combined class. The length of the unit was six lessons for both classes and the length of each lesson was 45 minutes. The teacher justified the length of the unit on the grounds that the grading periods were six weeks long. She said that, if she kept the length of her units six weeks long, she would be able to get her course of study units in.

The Students in the Two Classes

There were a total of 34 students in the fourth grade volleyball class. Four of them were mainstreamed from a special needs class. The skill level of the students was described by the teacher as average. As she put it:

Skill-wise, I would say that I have a few that I would say that are above average skill wise, but I have mostly average skill in that group. I also have a couple of students that are very, very unmotivated in that group. So they're very large and I'll be working to motivate them as I have been all year. (Pre-Unit Interview, pp. 19-20)

In the fourth and fifth combined grade volleyball class there were 29 students and there were no mainstreamed students. The skill and motivational
level of this group of students were characterized by the teacher as above average. She indicated:

Skill wise you're going to see more outstanding [pupils] in the fourth and fifth grade and you're going to see that a lot of them are very self-motivated but that's why they're in a split class so you'll see a lot of self-motivation. I'll have a lot of good leaders in there to help and do different activities with groups. (Pre-Unit Interview, p. 20)

RQ. 1. What instructional practices does an experienced physical education teacher employ in teaching volleyball to elementary students?

RQ. 1.1. What is the nature of the content and how is it structured and delivered through learning tasks?

Nature of Content Covered
Content refers to the volleyball skills and knowledge covered in the units taught to the two classes. The content related instructional goals of the teacher for the volleyball units for both classes were very similar. Irene planned to cover and covered three basic volleyball skills, the underhand serve, the set, and the bump, and have her pupils practice and learn the skills progressively in different conditions. As she stated:

They [pupils] will get into underhand serving. They will get into setting; setting with a leader; setting with partners. They will get into forearm passing, bumping. Mostly I start with the leader and we'll find out how well they can do back and forth with a partner. We'll get into different games where they use these skills and then get into rotation and some of the rules that they have to know to play the game. (Pre-Unit Interview, p. 15)

These skills, according to the teacher, were to be covered quickly so that the students would be able to use them in lead up or modified volleyball games. The fourth and fifth combined grade was also introduced to rotation, which the teacher treated as both a skill and as a rule of the game. As she put it, "... I
consider rotation to be not only a rule but a skill" (Post Unit Interview, p. 15). Volleyball skills such as spiking or blocking were not part of the teacher's goals for the unit and were not taught. Additionally, no strategies were planned or taught.

In terms of the knowledge about the game, the teacher introduced few rules regarding the role of the boundaries and the net when serving or sending the ball across the net. She instructed her students that it was illegal for one person to hit the ball twice in a row. More frequently than not, rules were loosely applied while others were modified to fit the needs of the students. For example, Irene taught and the students, during their game play tasks, considered and followed the rule that if the ball landed on the line it should be considered "good" because the lines were part of the court (Field Notes, Lesson #5). On the other hand, the teacher did not require her students to serve the ball from the back court line. In fact, she frequently encouraged her students to serve from anywhere on the court they felt comfortable either during a practice task or a lead-up and/or modified game (Field Notes, Lesson #2). Irene, periodically, commented when an illegal hit was, yet rarely did she use the notion of a legal hit during her teaching. During her active supervision she would instruct the students to avoid slapping the ball, but the comment functioned as a corrective statement rather than an attempt to have her students consider the legality of the hit (Field Notes, Lesson #5).

In terms of other types of knowledge the teacher taught and frequently reviewed information regarding the country, state, and city the game of volleyball was invented. She brought up the fact that volleyball was an Olympic sport, was one of the most popular recreational games, and that it can be played on many occasions such as during a picnic or in a family reunion, and so on.
Warm-Up

There were both similarities and differences in the lesson structure and content progression that took place in both classes through the tasks chosen. With the exception of the last lesson of the unit in the combined fourth and fifth grade class, the teacher included warm-up activities in each lesson. All warm-up sections of the lessons contained volleyball content specific activities in that either modified forms of the serve, set, and bump were either introduced and/or reviewed or the skills themselves already introduced in the previous lessons were reviewed. The warm-up activities were identical in the first, second, third, and fifth lessons of the unit in both classes. In the first two lessons in both classes, the teacher used balloons for the purposes of warming up. One of the reasons the teacher used balloons was to achieve a smooth transition from past learning experiences into the sport of volleyball. As the teacher indicated:

In the third grade during the developmental unit we used the balloons to do all kinds of body part things with the balloons. So that's a transition. I take them back to remembering things we did in the third grade and we just put it together now with taking it into the sport of volleyball. (Post-Lesson Interview, Lesson # 1)

The tasks performed when using the balloons were related to controlling an object, the balloon, using volleyball-like skills, including the serve, set, and bump.

The third and fifth lessons, the warm-up activities were identical in both classes (see Table 3 and Table 5). In the fourth lesson the content of the warm-ups was different for each class (see Table 4). In the fourth grade the warm-up was the same as in the third lesson, while the combined grade consisted of guided practice for the set and bump. Finally, in the sixth lesson, the warm up
section for the fourth grade included guided practice of the three volleyball skills, while there was no warm-up for the combined grade (see Table 6). They started the lesson with a new task. However, the new task involved practice of the bump skill, introduced earlier in the unit.

In summary, eleven of the twelve lessons included warm-up sections which were very similar for both classes. All the warm-up sections were specific to volleyball. All the tasks involved students working individually or in groups of two and resulted in high engagement time.

**Sequencing of Skills**

The sequence with which the teacher covered the skills was identical in both classes. She first introduced the serve because, as she stated, "it is the skill that starts the game". She moved on to introduce the set and, finally, the bump. She also introduced rotation, which she treated as a skill, but only to the combined class. The reason she provided for not covering rotation with the fourth graders was that they needed to work more on the basic skills of serve, set, and bump (Post-Lesson Interview, Lesson # 5). Although the sequence of introducing and covering the skills was exactly the same for both classes, the timing was different.

**Content Development**

The types of tasks that the students were engaged in during the unit were identified and coded as being different in terms of how they functioned in the lesson and content development. They were labeled as follows: Warm-up tasks (WIT), review tasks (RT), initial guided practice tasks (IGP), and review guided practice tasks (RGP). Additionally, the commonly used task types, informing (I), extending (E), refining (R), and applying (A) tasks were used in coding the tasks. Finally, there were few instances that the types of tasks used were of mixed
nature in that the task statement contained elements that would, for example, allow the task to be classified as either or both applying or refining. In such instances, a task was noted as applying/refining (A/R). Given this classification format, all types of tasks were present in both classes. However, there were few differences between the classes in terms of the number of refining tasks used for the serve skill, for example, or the number of informing tasks in the entire unit.

While the tasks the teacher chose for her pupils to practice were, for the most part, identical there were noticeable differences in terms of, a) the timing of when each skill was introduced to the students, b) the time students of both classes spent on each of the tasks, and c) the amount of content covered by each class.

Both classes started with the same task, that is, the "serving against the wall on a marked target" as it is shown in Table 1. However, the time pupils from each class spent on this task was quite different. For example, while the fourth graders spent 7:45 minutes on this task, the combined class spent only 3:55 minutes. As a result, the combined class moved on faster to different tasks addressing different volleyball skills. Initially, there was an obvious difference in the skill level for the serve between the two classes that accounted for the different pace of content coverage at that stage of the unit.

In terms of skills introduced during the first lesson, there was no difference between the two classes. There was, nevertheless, one task that was different between the two classes, that of the "keep it up" game-like task conducted in small groups (see Table 1). In terms of the number and type of tasks as well as the student practice time there were some differences between the two classes. The fourth grade class engaged in 5 tasks (1WIT, 1I and 3R) for
a total of 17:15 minutes and the combined class was engaged in 4 tasks (1WIT, 1I, 1R, and 1A) for a total of 15:30 minutes.

<table>
<thead>
<tr>
<th>Task Type</th>
<th>Time</th>
<th>Task Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-up introductory activities</td>
<td>WIA</td>
<td>Warm-up introductory activities</td>
<td>WIA</td>
</tr>
<tr>
<td>Serving against the wall on a marked target</td>
<td>I</td>
<td>Serving against the wall on a marked target</td>
<td>I</td>
</tr>
<tr>
<td>Same as above</td>
<td>R</td>
<td>Same as above</td>
<td>R</td>
</tr>
<tr>
<td>Same as above</td>
<td>R</td>
<td>&quot;Keep it up&quot; in small groups</td>
<td>A</td>
</tr>
</tbody>
</table>

Total Practice Time: 17:15

Total Practice Time: 15:30

Table 1: Content Development and Practice Time in Lesson 1 in the Fourth and Fourth and Fifth Combined Grade Classes.

In the second lesson, there was a difference in terms of the skills introduced between the two classes. While the fourth grade class was involved in tasks addressing the practicing of the serve only, the combined class, in addition to practicing the serve, was introduced to the set skill (see Table 2). The fourth grade class had the opportunity to engaged in 5 tasks (1WIT, 1RT, 2E, and 1R) for a total of 14:40 minutes. The combined class engaged in 4 tasks (1WIT, 1E, 1I, and 1R) for 16:40 minutes of practice time.
Table 2: Content Development and Practice Time in Lesson 2 in the Fourth and Fourth and Fifth Combined Grade Classes

The fourth grade class was introduced to the set in the third lesson at about the same time that the combined class was introduced to the bump, the third major skill taught in this unit (see Table 3). In terms of the number and type of tasks in the third lesson, the fourth grade class engaged in 8 tasks (2E, 2A, 1IGP, 1I, 1R, and 1A/R) for 15:35 minutes. Students in the combined class engaged in 7 tasks (1A, 1RA, 1RGP, 1RT, 2IGP, and 1I) for 13:55 minutes.
### Table 3: Content Development and Practice Time in Lesson 3 in the Fourth and Fourth and Fifth Combined Grade Classes

<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shower serving across the net from anywhere in the courts</td>
<td>E</td>
<td>0:40</td>
<td>Shower serving across the net from anywhere in the courts</td>
<td>A</td>
<td>1:25</td>
</tr>
<tr>
<td>Same as above - count number of successful serves</td>
<td>A</td>
<td>1:10</td>
<td>Same as above - accordion drill (serving from close distance and, if successful, take a step backward)</td>
<td>R/A</td>
<td>1:10</td>
</tr>
<tr>
<td>Same as above - accordion drill (serving from close distance and, if successful, take a step backward)</td>
<td>E</td>
<td>1:45</td>
<td>Review guided practice of set</td>
<td>RGP</td>
<td>1:15</td>
</tr>
<tr>
<td>Initial guided practice of set</td>
<td>IGP</td>
<td>1:15</td>
<td>Set a tossed ball to the leader</td>
<td>RT</td>
<td>3:50</td>
</tr>
<tr>
<td>Set a tossed ball</td>
<td>I</td>
<td>2:05</td>
<td>Initial guided practice for bump</td>
<td>IGP</td>
<td>2:10</td>
</tr>
<tr>
<td>Same as above</td>
<td>R</td>
<td>3:30</td>
<td>Initial guided practice for bump and shrug</td>
<td>IGP</td>
<td>0:20</td>
</tr>
<tr>
<td>&quot;Keep it up&quot; across the net using serving and setting</td>
<td>A</td>
<td>0:45</td>
<td>Bump a tossed ball to the leader</td>
<td>I</td>
<td>3:45</td>
</tr>
<tr>
<td>Same as above</td>
<td>A/R</td>
<td>2:15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as above</td>
<td>A</td>
<td>2:10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Practice Time: 15:35

Total Practice Time: 13:55

In the fourth lesson (see Table 4), while skills and practice appeared to be similar, the tasks assigned to both classes were quite different, especially in the second half of the lessons. While the fourth grade class finished the lesson at about the same point that the combined class finished the third lesson, the
combined group was engaged in tasks of a drill-like nature or lead up or modified volleyball games. It is also interesting to notice that the teacher chose to have different tasks for two different groups in the combined class. Additionally, each group was given a different type of ball to facilitate the pupils' participation in the learning tasks (Field Notes, Lesson # 4). Students in the fourth class involved in 7 tasks (2RT, 1E, 2R, 1IGP, and 1I) and the total practice time for them was 12:55. Students in the combined class engaged in 10 tasks (2RGP, 3E, 3R, and 2 A) for 17:15.
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shower serving</td>
<td>RT</td>
<td>1:00</td>
<td>Review Guided Practice</td>
<td>RGP</td>
<td>1:50</td>
</tr>
<tr>
<td>Shower serving - Accordion</td>
<td>RT</td>
<td>1:20</td>
<td>Review Guided Practice</td>
<td>RGP</td>
<td>3:00</td>
</tr>
<tr>
<td>Set a tossed ball over the net to the leader</td>
<td>E</td>
<td>3:05</td>
<td>Set a tossed ball over the net to the leader</td>
<td>E</td>
<td>2:25</td>
</tr>
<tr>
<td>Same as above - meet the ball in front of you, not behind; avoid slapping the ball.</td>
<td>R</td>
<td>2:40</td>
<td>Same as above - emphasis on spread fingers</td>
<td>R</td>
<td>1:15</td>
</tr>
<tr>
<td>Initial guided practice for bump</td>
<td>IGP</td>
<td>3:10</td>
<td>Two concurrent tasks: 1. (Fourth grade group) Bump a tossed ball to the leader</td>
<td>R</td>
<td>4:15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. (Fifth grade group) The right front person tosses the ball to the back court person who bumps it to the center front person standing by the net</td>
<td>E</td>
<td>4:15</td>
</tr>
<tr>
<td>Bump a tossed ball to the leader</td>
<td>I</td>
<td>0:40</td>
<td>Two concurrent tasks: 1. (Fourth grade group) Same as above</td>
<td>R</td>
<td>1:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. (Fifth grade group) Same as above but the center front person set the ball over the net</td>
<td>E</td>
<td>1:00</td>
</tr>
</tbody>
</table>

(To be continued)

Table 4: Content Development and Practice Time in Lesson 4 in the Fourth and Fourth and Fifth Combined Grade Classes

64
The fifth lesson for both classes was similar and involved practicing tasks with the exception of the rotation skill that was introduced to the combined group. Most of the tasks appeared to have a review function in terms of the three basic volleyball skills introduced to both classes (see Table 5). More specifically, the fourth grade class engaged in 7 tasks (2RGP, 1RT, 2A, and 2E) for a total of 19:15 minutes of practice time. The combined class engaged in 8 tasks (2RGP, 3RT, 1I, 1A, and 1E) for 16:50 minutes of practice time.
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review guided practice of set</td>
<td>RGP</td>
<td>1:55</td>
<td>Review guided practice of set</td>
<td>RGP</td>
<td>0:35</td>
</tr>
<tr>
<td>Review guided practice of bump</td>
<td>RGP</td>
<td>2:20</td>
<td>Review guided practice of bump</td>
<td>RGP</td>
<td>0:50</td>
</tr>
<tr>
<td>Bumping a tossed ball to the leader</td>
<td>RT</td>
<td>1:25</td>
<td>Keep it up across the net using serve, set and bump.</td>
<td>RT</td>
<td>1:35</td>
</tr>
<tr>
<td>Same as above - emphasis on counting and use of forearms</td>
<td>A</td>
<td>3:40</td>
<td>Same as above - emphasis on team effort</td>
<td>RT</td>
<td>1:50</td>
</tr>
<tr>
<td>Bump to the center front person</td>
<td>E</td>
<td>5:50</td>
<td>Same as above - emphasis on moving to and calling the ball</td>
<td>RT</td>
<td>3:10</td>
</tr>
<tr>
<td>&quot;Keep it up&quot; across the net using serving, setting, and bumping</td>
<td>A</td>
<td>2:10</td>
<td>Rotation of the volleyball positions</td>
<td>I</td>
<td>4:00</td>
</tr>
<tr>
<td>Same as above - emphasis on working together and calling the ball</td>
<td>E</td>
<td>1:55</td>
<td>Modified volleyball game using serve, set, bump, and rotation; training ball</td>
<td>A</td>
<td>4:50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Same as above - emphasis on game rules</td>
<td>E</td>
<td>2:05</td>
</tr>
</tbody>
</table>

| Total Practice Time:                     | 19:15 | Total Practice Time:                     | 16:50 |

Table 5: Content Development and Practice Time in Lesson 5 in the Fourth and Fourth and Fifth Combined Grade Classes

The sixth and final lesson of the unit included similar and different tasks for both classes (see Table 6). Both classes were introduced to and practiced the same drill addressing the skill of bump for exactly the same length of time. However, the rest of the time was spent differently; half of the pupils in the
fourth grade class spent their time practicing a previously introduced drill (i.e., the set across the net to the leader) while the teacher evaluated. The rest of the pupils were engaged in a keep it up lead up volleyball game. In the combined class one half of the class spent the rest of the class time in a lead-up volleyball game, while the other half was engaged in a modified volleyball game involving rotation and trying to hit the ball three times before sending it back over the net (Field Notes, Lesson #6). In the last lesson, the fourth grade class engaged in 7 tasks (3RGP, 1E, and 2A) for 18:30 minutes. The combined class engaged in 9 tasks (1E, 1R, 1RT, and 6A) for 18:25 minutes.
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review guided practice - serve</td>
<td>RGP</td>
<td>1:20</td>
<td>T-drill - bump back to the leader a tossed ball to the sides - left and / or right - of the receiver</td>
<td>E</td>
<td>3:50</td>
</tr>
<tr>
<td>Review guided practice - set</td>
<td>RGP</td>
<td>1:30</td>
<td>Same as above - emphasis on moving both feet</td>
<td>R</td>
<td>2:25</td>
</tr>
<tr>
<td>Review guided practice - bump</td>
<td>RGP</td>
<td>2:05</td>
<td>Review rotation task</td>
<td>RT</td>
<td>0:50</td>
</tr>
<tr>
<td>T-drill - bump back to the leader a tossed ball to the sides - left and / or right - of the receiver</td>
<td>E</td>
<td>3:00</td>
<td>Two concurrent tasks:</td>
<td>A</td>
<td>1:20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. (Fourth grade) Keep it up game across the net using serve, set, and bump</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. (Fifth grade) Modified game using serve, set, and bump. Three hits on each side; use of training ball</td>
<td>A</td>
<td>1:20</td>
</tr>
<tr>
<td>Same as above - avoid swinging of the arms</td>
<td>R</td>
<td>3:15</td>
<td>Two concurrent tasks:</td>
<td>A</td>
<td>3:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Fourth grade: same; students continue the task</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. (Fifth grade) same but with beach balls</td>
<td>A</td>
<td>1:25*</td>
</tr>
</tbody>
</table>

(To be continued)

Table 6: Content Development and Practice Time in Lesson 6 in the Fourth and Fourth and Fifth Combined Grade Classes

Key

* One group was engaged for 1:35 minutes less in one task
Table 6 (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two concurrent tasks</td>
<td></td>
<td></td>
<td>Two concurrent tasks:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Keep up the ball across the net using serve, set and bump.</td>
<td>A</td>
<td></td>
<td>1. Fourth grade: same; students continue the task - three hit on each side.</td>
<td>A</td>
<td>7:00</td>
</tr>
<tr>
<td>2. Set across the net to the leader - assessment of technique</td>
<td>A</td>
<td>7:20</td>
<td>2. (Fifth grade) same but with training balls - avoid sloppy use of skills</td>
<td>A</td>
<td>7:00</td>
</tr>
</tbody>
</table>

Total Practice Time: 18:30                                      Total Practice Time: 18:25

In summary, the development of the content in the two classes was similar. Across the 6 volleyball unit lessons in the fourth grade class, Irene used a total of 39 tasks: 2 warm-up introductory tasks, 3 informing, 7 extending, 9 refining, 6 applying, 4 review tasks, 1 applying/refining, 2 initial guided practice, and 5 review guided practice. In the combined class, Irene used a total of 40 tasks: 2 warm-up introductory tasks, 4 informing, 6 extending, 6 refining, 9 applying, 5 review tasks, 1 applying/refining, 4 initial guided practice, and 3 review guided practice. Both classes engaged in two warm-up introductory tasks and in one applying/refining task. In the following categories the teacher used less tasks in the fourth grade class compared to the combined class: Informing tasks (3 vs. 4), applying (6 vs. 9), review tasks (4 vs. 5), and initial guided practice (2 vs. 4). Irene used more tasks in the fourth grade class compared to the combined class in the following categories: Extending (7 vs. 6), refining (9 vs. 6), and review guided practice (5 vs. 3).
In the fourth grade class, the students were engaged in practice time a total of 97:20 minutes and the students in the combined class were engaged a total of 98:35 minutes. In other words, almost one third (33%) of the class time was devoted to pupils' practicing skills. The practice time per lesson in the fourth grade class ranged from 12:55 to 19:15 minutes. The practice time in the combined class ranged from 13:55 to 18:25 minutes. The rest of the 45-minute lessons were spent primarily on either content presentations including skill and/or task description, skill explanation, and demonstrations, or transition and management. Minimal time was spent on management.

Time Distribution and Patterns of Instructional Practices

The teacher utilized similar patterns of instructional practices in both classes to present the content to her pupils, organize them for practice, engage them in the tasks, supervise their involvement and manage their behaviors. The major teaching practice categories that emerged and the time distribution among these categories are presented in Tables 7-10. Data for these Tables derived from time analysis of four lessons.

The categories of teaching practices include instruction, transition, student practice, and management. The category instruction consisted of three subcategories, including, a) teacher description, explanation, and/or demonstration of the task, b) pupil only and/or pupil and teacher demonstration, and c) teacher feedback to the entire class immediately after student practice of a task. The rest of the teaching practice categories include transition, student practice, and management.

To understand how time was allocated in each lesson, one reads Table 7 from left to right showing the direction and amount of time for each teaching category. Table 7, for example, reads as follows: The teacher started her class by
spending 1:10 minutes on management which was followed by a 55-second
description, explanation or demonstration of a task related to the skill of set. She
then attended to a managerial issue for 20 seconds. After spending 2:30 minutes
organizing the students and/or equipment for practice, she spent 10 seconds
reminding the students of the task at hand. Student practice took place for 30
seconds, and 30 more seconds were devoted to class feedback about their
performance on the task involving the volleyball skill of set. The next 25 seconds
that were spent on describing, explaining, and/or demonstrating a task
involving the practice of set and followed by 40 seconds of student practice and
15 seconds of class feedback. The next 10 seconds of teacher description were
followed by a student and/or combined pupil and teacher demonstration. The
reading of the Table can continue for the rest of the lesson.

The time distribution analysis (see Tables 7-10) indicated that the teacher
spent considerable time instructing her students. The category instruction in the
fourth grade class was 36% and 46% in the second and third lesson respectively
and for the combined class was 41% and 49%. Irene took time to describe and
explain skills carefully. She always included teacher demonstrations when
introducing a new skill or even when she reviewed a skill. As the tables indicate,
Irene used student demonstrations several times in each lesson. Finally, she
provided her classes with content related feedback at the end of nearly every task
as the asterisks in the Tables indicate. The category post-task feedback was not
coded in terms of the amount of time devoted to class feedback because the
feedback statements were embedded in the teacher's next task presentation.

The second major category that Irene spent a considerable amount of time
was the students' practice time category. More specifically, the student practice
time in the second and third lessons in the fourth grade class was 35% and 38%
and for the combined class was 41% and 49%. The students were involved in several tasks in every lesson. Some of the tasks involved practicing a new skill under one or more conditions, while others involved reviewing a skill already introduced.

There were several transitions in each class which varied in terms of their length. The longer transitions typically involved organizing pupils for activity while the shortest ones involved organizing equipment. The transition time in the second and third lessons in the fourth grade class was 27% and 16% and in the combined class was 18% in both lessons. There was very little time spent on management. The vast majority of the management events lasted for less than 20 seconds. The management time in both classes in the second and third lessons was 3% and 0% respectively.
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1:10</td>
</tr>
<tr>
<td>Set</td>
<td>0:55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2:50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:10</td>
<td></td>
<td>0:30</td>
<td>0:30</td>
<td>0:15</td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:25</td>
<td>0:30</td>
<td>0:40</td>
<td>0:15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:10</td>
<td>0:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:15</td>
<td>2:00</td>
<td>0:15</td>
<td>0:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:30</td>
<td>0:35</td>
<td>0:50</td>
<td>*</td>
<td>0:10</td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:45</td>
<td>1:40</td>
<td>*</td>
<td>0:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:30</td>
<td>0:25</td>
<td>2:00</td>
<td>1:00</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:25</td>
<td></td>
<td>2:20</td>
<td>3:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:50</td>
<td></td>
<td>2:20</td>
<td>3:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:10</td>
<td></td>
<td>3:40</td>
<td>*</td>
<td>1:10</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:20</td>
<td></td>
<td>2:40</td>
<td>3:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:20</td>
<td></td>
<td>2:10</td>
<td>0:40</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:30</td>
<td></td>
<td>1:10</td>
<td>0:35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Time %</td>
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<td>35%</td>
<td>3%</td>
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</table>

Table 7: Time Distribution in Lesson 2 in the Fourth Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
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<tr>
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<tr>
<td>Set</td>
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</tbody>
</table>

| Time %  | 41%**       | 18%                  | 38%        | 3%              |                   |            |

Table 8: Time Distribution During Lesson 2 in the Fourth and Fifth Combined Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback

*** The 5th graders' practice time 4:05 4th graders' students' practice time 3:15
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2:30</td>
<td>2:35</td>
<td>1:50</td>
<td>0:40</td>
<td>1:10</td>
<td>*</td>
</tr>
<tr>
<td>Serve</td>
<td>2:55</td>
<td>0:30</td>
<td>1:20</td>
<td>0:40</td>
<td>1:10</td>
<td>*</td>
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<td>0:55</td>
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<td>Serve/</td>
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<tr>
<td>Set</td>
<td>1:15</td>
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<tr>
<td>Serve/</td>
<td>0:55</td>
<td>2:15</td>
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<td>*</td>
</tr>
<tr>
<td>Set</td>
<td>1:05</td>
<td>2:10</td>
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</tbody>
</table>

**Total**  

| Time %    | 46%** | 16% | 38% | 0% |

Table 9: Time Distribution During Lesson 3 in the Fourth Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice.

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback.
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serve</td>
<td>1:55</td>
<td>2:15</td>
<td>3:05</td>
<td></td>
<td>*</td>
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</tr>
<tr>
<td>Serve</td>
<td>1:10</td>
<td>1:15</td>
<td>1:25</td>
<td>2:10</td>
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</tr>
<tr>
<td>Bump</td>
<td>1:40</td>
<td>1:40</td>
<td>1:15</td>
<td>0:45</td>
<td>3:50</td>
<td>0:35</td>
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<tr>
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<td>2:10</td>
<td>0:20</td>
<td>1:30</td>
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<tr>
<td>Total</td>
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<tr>
<td>Time%</td>
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<td>18%</td>
<td>33%</td>
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</tbody>
</table>

Table 10: Time Distribution During Lesson 3 in the Fourth and Fifth Combined Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher’s descriptions and demonstrations, student/teacher demonstration, and post-task feedback

**Summary**

Irene taught a variety of skills, including the serve, set, and the forearm pass. She developed the content progressively using various types of tasks, including informing, extending, refining, applying, review, and guided practice.
tasks. She used several refining and extending tasks before using applying tasks. Most of the applying tasks took place in the last two lessons of the unit. There was little difference between the two classes in terms of the content covered and tasks employed. The difference in content consisted in the teaching of rotation in the fourth and fifth combined class. Irene used more applying tasks in the combined class while she used more refining tasks in the fourth grade class. The context of the gymnasium influenced sometimes the choice of tasks. The students spent approximately one third (33%) of the class time engaged in the assigned tasks. The rest of the time was spent mostly on instruction and transition.

RQ. 1. 2. How do the teachers communicate the tasks to the students and interact with them?

Task Communication

The teacher communicated the content of the students using a variety of presentation techniques, including descriptions, explanations, and demonstrations. Irene presented the content of the tasks clearly and methodically. After the introduction of a skill for first time, she assigned a number of various tasks to the students to give them the opportunity to practice and learn the subject matter. In presenting the tasks, she provided the students with clear information regarding the goal and conditions under which the task was to be performed. When introducing a skill for first time, the information tended to be more detailed in that it contained more critical elements that described the skill and more elaborations. When introducing a task, the amount of information included varied depending on the type of the task. The task and/or content presentation was a straightforward teacher description of the
elements of the skill and the organizational structure and procedure was incorporated in the task. Several times the presentations contained questions directed to the students. The presentation was also systematic in that the teacher tended to address first the general structure of the task addressing the student configuration in which the task was to be performed and was followed by the skill related information.

When introducing a new skill, Irene informed the students about the skill and the reason for which it is used in the game. In doing so, she connected frequently the new skill with the skill the students were practicing. The connection was stimulating and interesting because the teacher tended to contrast and at the same time compliment the uses of the two skills in the game. The description contained several critical elements and elaborations. Every single critical element was demonstrated elegantly by the teacher several times. An excerpt will follow to depict the manner in which the teacher presented the skill of bump. The students were sitting in small groups throughout the floor.

The skill presentation led smoothly into guided practice.

The set was the skill that we used when the ball was coming high. A lot of times the ball does not come to you at a high level. Some times the ball will come to you below the waist and it is kind of hard to get down below the waist and set it up quickly. (Field Notes, Lesson #4)

As the teacher verbalized "it is kind of hard to get down below the waist and set it up quickly," she showed how awkward it could be to attempt a set from a very low position by getting into her knees and pretend setting the ball from a very low position - her elbows touched the ground. The students were very attentive as the presentation of the skill continued:

So there is another skill that you use in the game of volleyball when the ball is coming low, below the waist. Would you raise your hand if you
already know the name of that skill or know what it looks like or anything like that?
Student: The forearm hit.
Teacher: Good for you. [The presentation continues].
It is not called the forearm hit actually. It is called the forearm pass, and
the nick name for it is the bump. And it is called the bump because it is
really a very soft controlled skill. Now, when you use the bump you use
the part of the arms from the elbow to the wrist. It does not include the
hands. There is a particular way though that you ought to hold your
hands. When you put your hands in position for the bump, you lay one
hand on top of the other. I want all of you to do it now including the
leaders. Then after you have one hand on top of the other with palms up,
you curl your fingers around so the thumbs are on top side by side [shows
as she speaks]. Thumbs are now side by side and you point them down
and you get your forearms as close together as you can by locking your
elbows. Stretch them out. (Field Notes, Lesson #4)

At this point, she asked all the students to stand and she guided them through
their bump motion. She demonstrated every single critical element that included
in her presentation throughout the verbal description of the skill. She started the
guided practice session by showing and saying:

I would like your feet, a shoulder width apart, just comfortable for good
balance; and I want you to bend your knees, get your arms out in front,
please; this is the bump position. This is the bump position. Now from
here you watch the ball as it hits the forearms and you just stand up with
it. You are straighten your legs and you are lifting the arms to shoulder
height and shrug your shoulders. There is no swing. That is the big
mistake, trying to swing; there is not. Now let's get to the bump position
and stand up with it. (Field Notes, Lesson #4)

The rather elaborate and detailed presentation of the new skill, the teacher
moved smoothly into a guided practice session followed by a task presentation
involving the bump.

Throughout the unit Irene used many cues or critical elements to describe
the technical aspects of a skill and/or how it was to be performed in a task. The
vast majority of the times these critical elements were simple and direct in
nature. For example the teacher would say, "bend your knees", "feet, shoulder
width apart", "eyes on the ball", "contact with your forearms" and so on. To facilitate student understanding of these critical elements, she always demonstrated slowly and meticulously and she matched a cue or critical element with precisely the corresponding body motion or position. Some critical elements the teacher used referred to more than one quality or features. For example, for teaching purposes, the cue "feet a shoulder width apart" refers to single quality. On the other hand, the critical element "ready position" for the skill of bump or set and so on, includes more than one feature since it addresses the position of the feet, knees, and hands/arms. Irene, taught and used critical element such as "ready position" "bump position" or "set position" and so on. She taught her students, for example, that the ready position corresponded to wide feet, bent knees and arms on the side and in front of the body. The students knew exactly what the critical element "ready position" meant and responded quite accurately to the teacher's direction regarding the cue. This was the case with other cues such as the set position or bump position and so on.

The teacher also used cues or short phrases to stress particular aspects of the pupils' performance. For example, Irene used the phrase "bump with your legs" to indicate the need for or importance of using the legs when bumping the ball, and avoiding or limiting the swinging of the arms.

The teacher described the process or strategy for presenting the cues to her pupils. She was teaching the cues that would help her pupils get in the right position for performing the skill first and then perform the skill correctly. As she stated:

You need to get to the ready position first and then to set.... Just trying to do it as simple for them, and progressively just ground one more thing so that they can make one more thing better so that they can become a little
better volleyball players. That's my process. (Post-Lesson Interview, Lesson # 2)

Irene's content development moves from a sequence of tasks involving the practice of a skill to a new sequence of tasks involving another skill(s) was systematic. She first asked the students to place all the equipment they used in the previous task(s). She then asked the students to get in groups and/or assume positions that would facilitate the task structure and/or organization of the next sequence of tasks. The third move was to start presenting the new task by reviewing its content. A task presentation of this nature, most of the time, involved a specific sequence of steps. For example, Irene reviewed/described the skill/content involved, described the structure and/or organization of the task, offered demonstration of what was to be happening and finished the task presentation with describing specific roles. At times, the end of the task presentation also incorporated a question directed to the students regarding their understanding. This was typically done using a choral response-like reaction but it involved a movement; the teacher, for example, asked the students to raise their thumbs to signal their understanding. The following excerpt describes such a content move and what was entailed. The students had just finished the practice of the serve and were asked to sit in their assigned courts.

We have been working on that set skill. The set is the skill used when the ball comes above the waist [shows]. We have our hands in this position [shows by placing her hands slightly above her forearm], palms away elbows out and down; we get those knees set, we get under the ball and we push it up and forward. We are going to do the set today in a drill that you are going to set the ball over the net. You will have a leader in front on the opposite side of the net I [the leader] will toss the ball over and you will need to set the ball back to the leader across the net. [Offers demonstration]. You will get to do two [sets] in the row and you will go to the end of the line. [Demonstrated the organizational procedure]. (Field Notes, Lesson #4)
At the end of the demonstration the teacher checked for understanding by saying "raise your hand if you understand how the drill works." The students responded positively. The teacher then asked the students to stand up, defined a leader in each group, gave a ball to each leader, reminded the leaders to give "good tosses" and the task started.

Several times the teacher stopped the class and instead of stating the task in a direct manner, she asked her students a few questions. The following excerpts presents such a situation.

I noticed in group that the ball goes over the tables. What does it tell you about the bump going over the tables? They are going too high and they are going too far. What do you need to change?
Student: inaudible
Teacher: OK you might need to stop swinging and just stand up.
Student: The power.
Teacher: The momentum, or the power, or the force. You might want to use less force if you want it to go back to the leader. [Do you] Remember we said that the bump is a soft touch? The bump is a soft touch you just stand up with it. (Field Notes, Lesson #3)

There were several contextual constraints that influenced Irene's teaching. The characteristics of the gymnasium, the nature of the skill, and the abilities of her fourth and fifth graders influenced Irene's choices of drills and tasks for the unit. For example, when practicing the set, she had the leader/tosser standing with his/her back to the net tossing the ball to each of the members of the group, who were standing facing the net at the back court.

On the other hand, when the students were practicing the bump, she had the leader/tosser stand in the back of the court facing the net while the pupils who were to bump the tossed ball back to the leader, were standing near the net and with their back to it. In the game of volleyball, players typically bump an oncoming free ball or a serve from the back court and attempt to direct the ball toward the center of the front court to the setter (Field Notes, Lesson # 3, 4th
Grade Class). In asking Irene about this seemingly "reverse" arrangement, she explained:

That was just so that the balls were not going over the net and bother the other groups. Legitimately, it would be nice if I had kept the person [leader/tosser] at the net because that's what they will be doing; they will be bumping to the net. We will be doing that. But I needed to have a wall behind them because of the lack of control on this first time and I did not want the balls to go over the net and interfere with my other groups. But eventually I want to change back around so that the leader is at the net and you can go right from that so that you can toss it and bump it back to me and I will set to that other person who is waiting to receive and that's legitimately what I want to go for. But they have to get a little more control of the bump first. (Post Lesson Interview, Lesson # 3)

The teaching context was a source of frustration for Irene because it did not provide an optimal teaching environment. The gymnasium, for example, was not large enough for the number of students in her classes and the situation was exacerbated because of the tables stacked on one side of the gymnasium make it even smaller and quite time consuming for the students to return balls from behind the tables. As Irene explained:

One of my frustrations... is with the tables in there. The courts on that side are a bit shorter and the balls will go behind the tables which takes away from their [children's'] bumping time. It is just one of the frustrations with the size and there is really nothing you can do about it. And it is not the fault of the children. (Post Lesson Interview, Lesson # 6)

Demonstrations

Irene used both teacher and student demonstrations very frequently. Her demonstrations were slow, clear, detailed, and precise. In explaining the reasons she used frequent demonstrations in the volleyball unit, she said:

Especially with volleyball ...there isn't much television coverage. The children sometimes were coming with not a lot of knowledge or background. I think that it's important that they have a visual to know what it looks like. I hesitate and I'll mention this because I have a volleyball video. I only like to use videos if I can do them for a real short period of time or I have done them a lot like if I get misplaced from the
gym and because I want the kids to be moving. I don't like them sitting
down and watching a video. That's what I'm trying to get them away
from. But if I have to show a video, I will. I would rather use a student
demonstration live or teacher demonstration live rather than just putting
them in front of the TV box again. So that's why I try not to use that very
much in my classroom. I have used them for stations before but my
volleyball does not lend itself to having a TV set up in that small space.
Because it would keep me from having space to do the skills. I think it just
helps them to picture it and to know what their body is supposed to look
like and when they actually see it and then do it gives them two senses
that are taking it in and it makes it just more exact I guess. (Post Unit
Interview, pp. 26-27)

In a post lesson interview, the teacher felt a bit uncertain as to what the
students attend to when observing a demonstration. She was not sure, for
example, whether the children pay attention to the whole body motion in
performing a skill or just to one aspect of the skill. She commented about this
issue by saying that:

[In demonstrating the bump] even when you touched the ball, I feel that
they may see it as a swing. And so when I demonstrate, I do it without a
ball, just as a movement exercise. I emphasize a lot the legs and that "frog"
look and stuff. [It] makes them laugh when they think about what a frog
looks like and, hopefully, then they get low enough, underneath, so that
the ball will go up, not just straight ahead. It is something that over the
years I decided it is an important thing to do; but I do think it is true with
children that, when you are talking about a skill like even the set, they
look at just the hands and the arms and they do not see how much work is
done with the legs in it. And they practice it as a movement thing first,
and they get the whole body movement. (Post Lesson Interview, Lesson
#3)

During the demonstrations, Irene demanded and had the full attention of
her students. She considered the time of demonstration important learning time
for her students. She quite frequently asked them questions to make sure they
understood what was to be performed and how. Her demonstrations were very
effective in that, a) the students seemed to demonstrate clear understanding of
the tasks that were to be performed, and b) only once during the entire unit in
both classes did she have to stop the class to briefly re-explain again the task at hand.

The Metaphors

During the teaching of the volleyball unit, Irene used a few metaphorical cues or examples to convey images to children regarding how a movement or the pupils might look when performing a particular skill. Among the examples or metaphors Irene used were the "frog" or "froggy position" the pupils might assume for the "set position". A second metaphor was the "window" position of the hands formed by the thumbs and index fingers when the pupils were preparing to contact the ball when setting a ball. A third metaphor was the "elephant-like" position of the arms when the pupils were to put their arms and hands together in preparation for bumping the ball.

When presenting the set to her pupils, for example, the teacher used the phrase "You may look like a frog." Set is a skill that requires a person to get in a position under an oncoming ball with the feet spread, the legs bent, and the hands above the forehead ready to contact the ball. In the post lesson interview that day Irene explained that:

The reason I used the "frog" [picture] was because you almost look like a frog with all the bending; you almost look like a frog that's ready to spring. I try to use the picture [imagery] because that is a visual for them, and, I think, a lot of times with children any kind of visuals you can use are helpful. (Post-Lesson Interview, Lesson # 3)

When the teacher was asked to further elaborate on the use of such examples or metaphors in her lessons, Irene indicated:

[An example or a metaphor] helps; there's an association. The frog, the window is something that they have had experience with. The children know what a frog is. They know how it moves. They know what a window is. They know that you look through a window and you can see something on the other side so there's an association with that. I'm calling
on previous experience and to bring it in so they maybe can more quickly pick up and see what they're supposed to do in a volleyball lesson. (Post Unit Interview, p. 27)

In addressing a question regarding the impact of such examples on the students' learning or class climate, she felt that this kind of image or picture helps pupils understand and possibly perform the movement or skill better because "they can imitate it." According to Irene, the teacher has to present the content in a way that the students can relate to it and understand it. She pointed out that the teacher needs to "take the instruction to the level of the students". Irene commented:

I think with the frog they chuckle a little bit and there's a motivational thing there, but I think that's a side effect. I think that it is not only for the quicker visualization but I think that the other thing is that with the window and the frog and those kinds of things, those words that I use you have to remember we're working with little children and those are just terms that they understand and so I'm trying to use words that they will understand. To take it to their level. Take the instruction to their level. It's just like when you're with kindergarten kids; you know, your language is totally different with them too. It's because that you're taking it to their level so that they can understand. ... Not only for the quickness of how they interpret, but then also for the more vivid visual picture of what they need to do so I think that helps them to make the skill more accurate. (Post Interview, p. 28)

Guided Practice

Irene used guided practice frequently before she allowed her students to get in groups to work independently. She used initial guided practice when she introduced the set and the bump. The students first practiced the skills of setting and bumping without balls with the guidance of the teacher. In all lessons following the introductions of a skill Irene used 'review guided practice' to remind her pupils of the body movements involved in all three basic volleyball skills she taught. In justifying the guided practice sessions she had with her pupils, she said:
I think you do the basic movement, the body movement, to feel what the body is doing first because sometimes, when you add the ball, they will put it in error just in moving to the ball. So, let's get the real feel, what it feels like correctly and then you can add the ball and then you try to keep that same correct movement. With the set you add the ball and if the toss isn't right to them, a lot of times they reach over this way [shows to the side] instead of moving their feet. If you tell them that they "ve got a feel for the movement and you go over and just say "I saw your hands over here," I think they are going to know that this movement is different from an up movement and that their feet have to get there first. (Post Lesson Interview, Lesson #5)

Grouping of Students

The teacher did use different grouping techniques within and across lessons and classes. In grouping the students, she sometimes randomly assigned individuals to groups or on other occasions she considered the developmental and skill level of the students for this grouping. During the first two lessons for the fourth grade class the grouping was random in nature. The teacher used either numbers or colors to place students in groups. For the rest of the lessons, she grouped the students frequently, to practice the various tasks, according to their skill level at the beginning of the lessons. Several times, for example, the teacher read from a list of names she had already prepared, the students she wanted to form a small group to work together.

The teacher used similar grouping techniques in the fourth and fifth combined grade class as well. There were few differences, nevertheless. The teacher, at times, grouped the students according to their grade level. For example, she had all the fifth graders form small groups and work together and all the fourth graders do the same. In justifying her decision, the teacher stated that there was a developmental and a skill related difference between the fourth and fifth graders that led her to group the students as she did. In the interviews the teacher indicated that occasionally she would have a couple of fourth graders
work in the same groups with the fifth graders because their developmental and skill levels were similar to the fifth graders. The teacher placed the students in groups right before the first group task in the lesson. If, occasionally, a group was smaller because of a student's absence, she added a student from a bigger group. The groups worked together for the part of the lesson that involved drills that did not require change in the number of students in the group. When a drill required a larger number of students, the teacher combined two groups into one. Although the grouping of the students was based on random choice initially, later they were grouped more on developmental or skill levels though in some instances the teacher moved a student from one group to another for, as the teacher indicated, managerial purposes.

Equipment and Environmental Arrangements

Irene used different equipment frequently to facilitate students' successful participation in the tasks. She used balloons during the warm-up sections of the first and second lessons. Additionally, she used four different kinds of balls, beach balls, training balls, foam balls, and regulation volleyball as the unit progressed. The foam balls were used only during the shower serving drill, while the rest of the balls were frequently manipulated in order to help students acquire the skills easily. The use of equipment was treated by the teacher as a factor influencing the students' performance in the various drills.

In the fourth grade class, the teacher used beach balls frequently during the lead-up games because, as the teacher indicated, they stay longer in the air giving students the opportunity to get under the ball before it hits the ground. Irene provided the same reasoning when she was asked about her move to change to the training ball for her fifth graders during their modified game in lesson 6, the last lesson of the unit. After a minute or so that the fifth graders
practiced with the beach ball, the teacher took the beach ball away and gave the training ball back to the students. In responding to the question as to whether she saw a difference in their performance, the teacher responded positively. She commented:

... The big new thing that we added [in the modified game] was the three hits and over; this was the new objective for the day. And I started them with the training balls that what they were using and I wanted to see what they could do. ... They were not very successful right away; I was feeling some frustration, some vibrations; so I took the beach balls back out and let them practice the three hits with the beach ball and see if they could be successful. And they were. The beach ball made it easier and they were able to get three hits. The group near to the stage I would let them keep the beach balls because they were not as successful. But the other groups were successful so I went back and gave them the training balls. (Post Lesson Interview, Lesson # 6)

There were other instances during the unit that the teacher made certain moves in terms of manipulating the equipment to assist students in experiencing success or meeting a challenge. For example, in the second lesson with her fourth grade class, while the entire class was practicing the serve using training balls, the teacher pulled a group of students to the end of the gymnasium to give them regulation balls to practice their serves against the wall (Field Notes, Lesson # 2, 4th Grade Class). In justifying her decision, the teacher said that:

The reason I pulled the students was because these students were successful using the training balls so I wanted to create a new station where they would practice their serves using the regulation ball.... and they were successful. (Post Lesson Interview, Lesson # 2)

Teacher Interactions

Irene interacted with her students very frequently during their engagement in the assigned tasks. The nature of the interactions was verbal, visual, and manual. The vast majority of the times, the verbal comments she offered to her students were specific to the skill(s) the students were working on.
The comments contained critical elements the students had already been taught or some form of encouragement.

Irene used a large number of critical elements to describe the skills to the students and used these critical elements to provide her students with feedback. For example for the skill of serve, she used the following critical elements to both describe the skill but also provide feedback to her students:

- Hold the ball out in front with left hand
- Hold the ball in front of the serving hand, not across the body
- Make the half feast, left foot in front, knees bent
- Arm makes the back swing nice and straight
- Weight on the back foot
- Swing arm forward straight through the ball
- Contact the ball on the heel of the hand
- Eyes on the ball until you hit it
- Follow through to the target after you have contacted the ball
- Look at the target after contacting the ball
- Arm and hand should aim to target after contacting the ball

(Field Notes, Lesson #2)

The teacher also used a large number of critical elements to describe the forearm pass or bump and provided her students with feedback using these cues while they were practicing the skill. A list with the critical elements used to provide feedback to her students follows:

- Hands together, one palm on the top of the other, thumbs side by side, parallel, pointing down
- Forearms wide up to the front
- Arms as close as possible
- No bending on the elbows
- No swing of arms
- Feet wide
- Contact the ball with both forearms at the same time
- Get under it (ball)
- Hands together
- Stand up with it (ball)
- Keep the eyes on the ball
- Move to the ball
- Shrug your shoulders
Finish with a shrug of the shoulders
Shoulders around your ears
Keep the arms straight
Bump position, hands together, stand up, and bump
Bump position
Bend your legs
Lock your elbows
Straighten your legs
Bend at the waist just a little bit (Field Notes, Lesson #3)

Irene used different patterns while offering feedback to the students.

Some statements were direct in nature; for example, "bend your knees," "use all the fingers," "ready position," and so on. Other times, Irene included in her feedback statement the function of the feedback; for example, "bend your knees to get under the ball," "move your feet to get to the spot", "arm and hand should aim to the target after contacting the ball to give direction" and so on. A third pattern of feedback was the grouping of a small number of critical elements; for example, "Bump position, hands together stand up, and bump." Sometimes, Irene matched a critical element with another of opposite meaning; for example, she said "Hold the ball in front of the serving hand, not across the body," or "use your fingers not the palms."

Most of the time Irene used the same exact word(s) to label a critical element of a skill when introducing it, reviewing it, or providing feedback to the students. Sometimes, however, she used different words or phrase to express the same meaning. For example, she said "no bending on the elbows" and "lock your elbows;" similarly, she used the cues "straighten your legs" and "stand up," to describe to the students the same action of the legs. Another pair of cues used with similar meanings was the "shrug your shoulders" and "shoulders by your ears."
It was very frequently the case in Irene's teaching, that she offered an individual demonstration to a student to assist him or her to understand a critical element or the entire movement itself. Such demonstrations were short, clear, and concise. At times, Irene offered manual assistance to some students in order for them to better feel the position of their body during the movement itself. When Irene introduced the bump skill, she went around to every single student in her classes to check their bump skill, and offered a comment to every student and manual assistance to most of them. She explained that the bump is a difficult skill for them and they need extra help. She also told them that she had high expectations of her students to perform the skills correctly and she wanted to make sure that they have understood the skill. Irene felt that going around and having every single student checked is something they like and appreciate (Post Lesson Interview, Lesson #4).

Irene was involved in her supervising responsibilities intensely during student practice. She frequently functioned as a leader who tossed the ball for a student to set it or bump it back. In fact, at times, she even modified the task in subtle ways to help a particular pupil with particular developmental characteristics to achieve what Irene thought was the maximum that student could accomplish at the time. For example, during the "T" drill in the fourth grade class, Irene worked with a student who was described as "tiny" from a physical development point of view. Irene decided to toss the ball to her, but instead of tossing the ball to the sides so that the student would have to move to get to the ball and face the tosser, she tossed the ball right in front of the student. Later on she explained that this adjustment was to assist the student to perform the skill correctly and gain some confidence (Post Lesson Interview, Lesson #6).
Irene was always aware of what was going on in her classes. She monitored closely her pupils' performance and level of success in relationship to the goal of the task and expectation and, when she deemed it was necessary to make some changes, she made the necessary adjustments to the tasks to ensure her pupils' optimal practice condition for the purpose of the task and for success.

In the last lesson, when she asked her students to hit the ball three times before they sent it over the net, she noticed that the students' efforts to meet the challenge and achieve the goal of the task resulted in poor, "sloppy" performance of the set and forearm passes. She felt uncomfortable with what she had observed and stopped the class. She commented on her decision later by saying:

During the modified game I did stop them once because I wanted to mention (she did indeed) that we did not want the skills to be sloppy; we worked very hard to get good sets, good bumps; remember your forms and try to stick with it. I did not want to be a stickler 'if you use one hand the hits would count" no. Because they worked for the three hits. But I did want to try to encourage the best form that they could give me. So they did pretty much stay with the modified volleyball right up to the end. (Post Lesson Interview, Lesson #6)

She also stopped her classes several times to make a suggestion or engage her students cognitively in relation to what they were doing. When her pupils, for example, had difficulty with their serves and bumps in terms of control and accuracy, she asked them about what they thought they needed to change in their performance to make it better. They indicated that they should work on adjusting the force they exerted on the balls. They responded by saying that they ought to hit the balls softer or with less force. To the teacher's question of "what force should you be using," the pupils responded "medium force" (Field Notes, Lesson #1). When later discussing the moment, the teacher commented that "they [pupils] showed awareness about what they needed to do to fix their performance" (Post Lesson Interview, Lesson #1).
Summary

Irene used verbal and visual methods to communicate the content to her students. When describing and/or explaining the skills and tasks to her students she used several critical elements. She also offered many teacher, teacher-student and student only demonstrations. The verbalization and demonstrations of the skills and tasks were slow and methodical. At times she asked her students questions to elicit content related responses. During student practice, she supervised actively her students' engagement in the tasks and offered frequent content related feedback, individual demonstrations, and manual assistance when it was needed.

RQ. 2. What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

This section attempts to address Irene's pedagogical theories of content, and more specifically, her pedagogical theories of volleyball. It attempts to explore the reasoning as to why she teaches volleyball to her students and how it facilitates the materialization of her educational and/or curricular goals. The question is based on the premise that teachers' educational beliefs and knowledge about a particular content area or topic may influence his or her teaching practices, which, in turn, may influence the extent and scope of student learning.

Irene's Background and Knowledge in Volleyball

Irene had participatory experience in volleyball as a high school and college student in intramural tournaments. After college, she had joined a women's volleyball team in a recreational center and was part of a teachers' team
at a middle school. While at college, she attended several power volleyball classes. She described her participatory and academic background in volleyball in the next interview excerpt:

My experiences as a high school student we had very little sports for women. We had intramurals that were not competitive and I did compete in volleyball intramurals at my school but it was very low key and not power volleyball so you have to get back to where I was as a high school student. At the University I did intramurals there and took several courses in volleyball that were power volleyball. It was very, very new to me. So I participated in intramurals there. Then after college, just to keep up with things, I did join a women's volleyball team and we competed just with the recreation center and then we had a teachers' team at the middle school that I played on there. (Pre-Unit Interview, p. 7)

Irene stated that the reasons that she participated in the sport of volleyball were that it:

... was just for the extra experience with it and to stay active in the game. It wasn't because I wanted to win any trophies or anything like that. Again, you know, as I said before, I loved the movement and just the fun of the sport, and anything else that came along with it was okay. (Pre-Unit Interview, p. 8)

Her favorite position as a participant in the game of volleyball was the back row. She stated:

I liked to play back. I liked to play the back row and set it up to the front row people. To set up the plays. So I'd say that was my favorite position to play when I was a participator. (Pre-Unit Interview, pp. 13-14)

Irene is a volleyball fan and likes to watch a volleyball game: "I do watch it sometimes when it is on TV, but not as much as I watch basketball games; but it's not on as much. But if I know it's on, I'll watch it, sure" (Pre-Unit Interview, p. 13). Irene pointed out that when she has the chance to watch a volleyball game she tries to not only watch and enjoy the game as a fan but also to learn something new about it that can potentially be helpful to her program. She stated:
I watch it because I enjoy the sport itself. For enjoyment but I think that I never watch any kind of a sport activity on television or video or anything else where I'm not looking to see if there's something I can use skill-wise, whether it's a drill, or maybe there's a play that's put in that I've never seen before. ... I think that just because I've been in this so often. I think you're always looking for those new kinds of things. It's just like when get videos that you're watching. You're always looking for new things that are going to make your program better. I think that's true just when I'm watching a sport too. Going to [X] State the women's games, watching the different team things that happen. That's always a good learning experience for me. But there's always enjoyment in everything. (Pre-Unit Interview, p. 13)

Irene had a total of four years of coaching experience with fourth, fifth, and sixth grade girls as part of a parochial system. She pointed out that her experiences with coaching were good and provided her with some insights in terms of how much students can learn even in a school setting if they pay the appropriate attention. She described:

The coaching was a good experience for me. It was revitalizing in a way because I only had 12 girls as opposed to having 32 - 33 children and I could really delve into the skills and take them very, very far as a team. It was the same 12 and we had three practices a week. I had them for an hour and a half every practice. It was amazing to me what could be accomplished. So that was good for me in that aspect. But it also made me come back here and realize even though I see these children just once a week they can accomplish pretty much if they pay attention and put a lot of effort into it. So that's my experience with it. (Pre-Unit Interview, p. 8)

Irene indicated that her knowledge of teaching the sport of volleyball is much stronger on the basics rather on the advanced skills and strategies of the game. She noted that at a point in time her knowledge was stronger but she lost some of it since she does not use it at the elementary level. However, she believes that she does have the appropriate knowledge and skill to teach volleyball to elementary level students. She stated:
Probably because of my background and teaching at the elementary so long, I think that I am probably stronger in those very basic beginning skills. Not as strong in the later skills of spiking, blocking. Still always learning about those things. Also because of being at the elementary level, I wouldn't say that I'm as strong in play making in a volleyball game. ... Because I don't teach those [strategies] to these children. That's beyond them. And because of not using them in my teaching, I haven't spent as much time studying those aspects of the game. And I think that, when you don't use things, you are loosing them. ... I've lost it because of lack of use. I'm sure that I could pick it up quicker than if I'd never used it, but it's when you don't use something that it's not going to be there. You're going to have to do a little bit more studying. ... It's a difficulty with being at the elementary level because you don't get to go to the advanced skills. (Pre-Unit Interview, pp. 14-15)

Irene pointed out that she does not consider herself as an expert in teaching volleyball. However, due to her personal affection for the sport and personal values, she tries to instill in her students positive feelings and attitudes about volleyball. She commented:

I have a personal love for volleyball. I'll put it that way. And it's not from me being an expert or anything like that. It is just a game that I really enjoy playing. And so I think that because I have that, that I like to feel that, it instill an enjoyment in the children and I think that, that changes my approach. I like a lot of the activities that I teach so I can put enjoyment into a lot of them. (Post Interview, p. 21)

**Reasons for Teaching Volleyball**

At the outset, there were two major goals that characterized Irene's physical education program, movement and participation. She wanted her students to become skillful, confident movers, and she wanted them to be able to enjoy their participation in movement. Additionally, she valued the development of fair play, fan behavior, respect for others, and cooperation. She believed volleyball provides a good learning environment for her students. She indicated that volleyball is a simple game, has simple rules, and it is a nice game
for elementary kids in that "there is nobody right up in your face." As she
described:

I think that I try to keep the game very, very simple for elementary
children. I like to teach the serve, the set, and the bump as quickly as
possible so that they can get into a game. I think that volleyball can be one
of the more simple of the games and kids can get into it very, very quickly.
It's not something where you have to wait three weeks to get into a game.
Whether it's shower volleyball or beach ball volleyball or whatever kind.
You can get into that back and forth. The other thing that I like about it is
that the rules are pretty simple. And the other thing that's real nice for
elementary kids is that there's nobody right up in your face. You pretty
much need to just worry about what you're doing and reacting to the ball.
You don't have to worry about somebody trying to take the ball away
from you. That is if we get the teammates doing what they're supposed
to, right? (Pre-Unit Interview, p. 7)

Irene contrasted volleyball to basketball in explaining how the nature of
the volleyball game can benefit some students. According to her, volleyball can
be a more relaxing game for some students, especially those who have not
developed yet their skills that will make them feel confident about what they can
do in a volleyball game. She said that:

... I think it [volleyball] is a little bit more relaxing for some of them
[pupils]. As I watch some of my students who are not as aggressive as
other students, basketball overwhelms some of them because the person
being there and trying to take it [ball] away from them right when they're
just learning how to hold onto it themselves, and they've just learned that,
so basketball becomes a little bit frustrating for some whereas in volleyball
I think they can build up a little bit of confidence because there isn't that in
your face kind of stuff going on. (Post Unit Interview, p. 7)

Another reason she offered why volleyball is an appropriate activity for
her students was that it is a life-long activity. She contrasted volleyball to
football in order to stress the fact that volleyball is one of the greatest recreational
games that people can play on many occasions throughout their lives. It was
important for her, therefore, that children be able to not only learn about the
game or how to play it but also to enjoy it. She said that:

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...I want them to like the [volleyball] game. I want them to enjoy it and see it as a very fun game to play and I try to emphasize at the beginning that it's one of the biggest recreational games in our country. You know, people play not just for competition but family reunions, on the beach, wherever. And it's a game that you can play for a long period of time. It's not like football where you play for so many years and then you're over the hill. It's a game that you can play so it can be a lifetime activity for them. (Pre-Unit Interview, p. 18)

Irene stated that in contrast to baseball, basketball or football, volleyball was not a "big" sport in the community where the children lived. As a result, when they came to her volleyball class, their skills were less variant in comparison to basketball. This resulted in the students' having more cooperative attitude toward each other. The teacher said that:

Whereas with the basketball unit to play in even lead-up games sometimes there are more details that have to be in there and more skills, plus the fact -and I'll throw this in for you- in the game of basketball there is such a variance in skill. We have some boys and girls that have been playing, whether it's street ball or what they're playing, so they have this idea. And then we have some that are still even at 4th and 5th grade may have difficulty catching a ball. There's such a variance. But I feel that in volleyball they come in leveled a little bit...they come in on a more even basis which makes it—I think it's very, very nice. Not only in the teaching but I think for the kids to learn the cooperation together is real nice. (Post-Unit Interview, p. 6)

Irene also noted that because the students come to her volleyball class with less background and experience and thus, less variance in their skills and knowledge, they exhibit more enthusiasm and willingness to learn volleyball. As Irene stated:

I don't have as many coming for volleyball that have all kinds of experience away from school with it. So as they're coming, they haven't really had team experience in the game of volleyball. They're coming and they're more sponge-like because they want to get information. They don't know everything about this game yet, so they're listening more and, I think, there's just this real interest in, you know, they may think 'this is a new game for me and it could be really a good one'. So I see that
enthusiasm and they're listening more because they don't have all this other knowledge from way out. (Post-Unit Interview, p. 7)

Goals in the Volleyball Unit

In describing the goals of the volleyball unit, Irene indicated that she wanted the students to understand the skills and rules, not only as participants, but also as fans. She wanted her students to enjoy their participation and be able to execute the basics skills in a "lead-up" or a modified game of volleyball. Finally, she wanted to have her students develop an appreciation for the sport of volleyball as a recreational game that can be played by people of all ages. She pointed out:

I'd like the children to understand how the game of volleyball works. I would like them to understand the skills and rules. Not only as a player but as a watcher. If you're watching volleyball and so that you're a knowledgeable fan. I would like them to achieve some proficiency in the basic skills of volleyball, if they're developmentally ready to perform the skills and they have that opportunity during my volleyball lesson. And then, I would like them to be able to use those basic skills in some type of a lead-up game situation for volleyball. So I guess knowledge, skills and I want them to like the game. I want them to enjoy it and see it as a very fun game to play and I try to emphasize at the beginning that it's one of the biggest recreational games in our country and that it is a game that you can play so it can be a lifetime activity for them. (Pre-Unit Interview, pp. 17-18)

The specific skills Irene planned to teach to her fourth and her fourth and fifth combined classes were underhand serve, set, and bump, and rotation as summarized in her following interview extract:

They will work on rotation, the underhand serve, the set, and the forearm pass and that's pretty much it other than the rules that are involved with that. We try to work on bump-set, that pattern. Putting some combinations together but other than that - like getting into blocking and spiking at the 4th grade level, no. (Pre-Unit Interview, p. 11)

Although she planned to teach the same skills to both classes, Irene mentioned that she wanted the fourth and fifth combined class to be able to reach
the point where they could perform a drill involving the "bump, set, and over the net" sequence:

I would like to be able with the second class to take my fifth graders farther. So we'll just have to see. I'd really like to get them definitely into the bump, set and over the net. Bump, set and over the net. Still not blocking or spiking at the fourth and fifth grade level. (Pre-Unit Interview, p. 20)

The selection of the skills and tasks for the unit, were based on her perceptions of the developmental levels of the fourth and fifth grade students. She explained:

I guess that when I plan my unit like with doing the different drills that I'm selecting and things like that, I think are chosen because the children are 4th graders and how old they are. So they are selected for their developmental level, 4th grade. If I was working with 6th grade, I might choose totally different drills. I might still be working just on the same skills but I'd come up with different drills that would make it more challenging and so that it would take their skill further, even though it's still a basic skill. That they would become more confident with it, stronger, more accurate; all those things. But I think that when I plan my units I'm trying to choose the drills that developmentally are appropriate for these children in 4th grade, 10 years old and 5th grade, 11 years old. (Pre-Unit Interview, p. 21)

Discussing the accomplishment of the volleyball unit's goals, Irene stated that although there were some differences on the level of success in the two classes, she felt that the students learned the basics skills of volleyball. In her words:

I think that there was a variance of success, depending on which classes we were dealing with. I think that in both classes I accomplished the teaching and the performance of basic skills. Not with 100% of the students, 100% of the time. But I do think that there was an appropriate amount of progress and that they knew the names of those basic skills, and they, in general, knew how to get their bodies in position to perform those skills to the best of their ability as a fourth grader or fifth grader. (Post Unit Interview, p. 1)
She indicated that there was more improvement in the fourth and fifth combined class and the students were able to play a modified game by the end of the unit. Irene commented:

For the fourth and fifth grade class the success was just a step-by-step, constant progression of just going from the skills to the game, adding the rules, playing and it just was kind of like one of those 'write it down because this is working beautifully with that particular group.' So I think that in that class the goals were met all the way through to putting it into a game, using it, showing the enjoyment. (Post Unit Interview, pp. 1-2)

In addressing the level of improvement in the fourth grade class, she stated that although the students were able to apply their skills in a "lead-up" game they were not able to reach the level that would allow them to play a modified game. In her own words:

In the fourth grade class we were able to put those skills into lead-up games only and not really to get into the more modified, more volleyball type game that I would have liked to but their skills did not allow them to do that. ... I do think that, even though they didn't do the modified more real to life volleyball game, I think that there was definitely enjoyment for what they were doing and that would lead me to believe that, if I did a unit for them again in the fifth grade, that they would be very happy to do it and we might be able to go further then. (Post Unit Interview, p. 2)

If she had to teach a volleyball unit to another 4th or 5th grade class, she indicated that she would use the same goals since she believed that these goals are "excellent" goals for elementary students. Based on the students' development and skills she may change some drills or game type of situations. In her own words:

I think I would still have those same goals. I think that those are excellent goals to have for fourth and fifth grade students. The only thing that I would have to be open to is that I'd have to be watching their development and their skill. If they're not ready to go into a modified game, I have to be able to accept that and realize that it would be more beneficial to them to stay in just lead up game where they're able to use their skills with some success and using it in some kind of a game situation. ...So I think that my
goals would still be the same. It would just be my strategies for making them develop the skills as best they can that I might change or modify a little bit. (Post Unit Interview, pp. 2-3)

She went on to point out that at times a teacher may have to differentiate tasks in a class due to students' developmental levels and abilities. The following two interview extracts, the first one from the pre-unit and the second from the post-unit interview, describe her views about this issue:

Now at the end you'll see that I would have a group of students who will be playing beach ball volleyball on one side of the gym and then I'll try to bring students who are a little bit more advanced to the other area and there I'll try to keep them behind a foot line and I'll do some officiating for them. That's just to give them an opportunity to get a better feel for the game. (Pre-Unit Interview, p. 11)

Also with a class you might have a group that you could have a modified game going on on one side and a lead up game on the other. I had that just for one day with my fourth and fifth grade and then they were all able to advance. (Post Unit Interview, pp. 2-3)

The observational data indicated that this teacher used different tasks and differential timing in introducing skills to the two classes (see Tables 1-6). There were indicators that the students' skill and developmental level differed which appeared to influence the teacher's decision regarding the timing of introducing a skill or the use of a specific task.

In discussing the question of how did her goals for the volleyball units develop, she noted they were influenced by the course of study and the philosophy of the school program:

Part of my goals are of course shaped by our course of study because we do have a volleyball course of study that gives us different skills that we need to present and teach. That's partly an outline that comes in there. One of our philosophies of our physical education program is the recreational value (be a lifelong active person). ... so it's kind of mixed up there with course of study and the philosophy of our program here at the school. (Post Unit Interview, pp. 3-4)
Comparing her volleyball goals with her other units' goals, she pointed out that some of the goals were skill oriented and specific to volleyball. However, her goal "enjoyment of movement" is more general and desirable for other units she teaches. She stated:

I think that some of my goals were definitely skill-specific for volleyball. I think the enjoyment of movement is always the goal for me. A personal goal. Whether it was in our philosophy or not it's in my own philosophy of physical education. ... So I think that that's just a personal philosophy that I have because I really want the children to feel very confident about being a mover. ... I really think that the big goal for elementary people is to make them confident. ... That they have confidence in themselves as a mover that they can participate no matter what. (Post Unit Interview, p. 5)

Irene emphasized that due to her coaching experiences with some fourth grade girls, there was a turning point in her expectations towards her fourth or fifth grade students in the school context that she teaches. Irene pointed out that she is a demanding teacher and expects her students to perform the skills in "her way" in all different units that she teaches. She said that for the volleyball unit her expectations are very high because of her volleyball coaching experience that she had. She realized that most of the students in her classes were capable of excelling like her "fourth or fifth grade girls' team" that she used to coach. In her own words:

I also think maybe because of my coaching experience with the 4th grade kids, a team that I coached were 4th grade girls, and because I saw the excellence that they achieved I know that 4th graders are very capable of achieving this if they apply themselves. So I think that underneath the enjoyment there is an urgency for me. I do have high expectations. I want you to do it the correct way because you can be good and you can do really good things if you listen to what I say and you really try to do it my way. I pretty much expect them to do what I say in every unit. But I think with volleyball there is that because I have coached 4th grade kids and I have coached 5th grade kids. And it was amazing to me after I coached them I thought to myself you know I haven't expected enough from my 4th grade kids at school. ... And so that's maybe what comes from the volleyball and the coaching because I saw these determined little
girls who just put so much effort into it and I wanted to see that same
desire from the kids here because they're very capable of it and so that
was there where it might not have been equal. I don't expect them in
gymnastics or in basketball not to perform to their ability. Now that's
never been there for me but there's this underlying thing now that I have
coached the volleyball that I have seen excellence with 4th grade kids and
you're just as capable of any kids anywhere in this world in the 4th grade
to do it if you apply yourself and so I guess that's there. (Post Interview,
pp. 22-23)

Summary

Irene has considerable background in volleyball which, when coupled
with her educational values, forms the basis for justifying the presence of the
game of volleyball in her physical education curriculum. Her volleyball
background included participatory experience for recreational purposes,
academic experience from college, and coaching and teaching experiences. She
believed that volleyball offered a means for her students to develop game skills
that can be used throughout their lives, confidence, cooperative skills, interest in
and enthusiasm for learning, and enjoyment derived from participation. These
beliefs were reflected in the goals of her unit.
CASE TWO: Anna

General Information

The Teaching Setting

Anna was teaching at an elementary school located in a suburban area with middle-upper socioeconomic class characteristics in a large midwestern city. The school population was mostly white. The school building was large and in an excellent condition and the gymnasium where Anna taught had the size of two regulation volleyball courts. According to Anna, her working conditions were pretty good. "The school has a very good support system, the students are pretty good, and the parents are very supportive" (Pre-Unit Interview, p. 3). The only contextual constraint that she mentioned was related to the gymnasium. She pointed out that the gymnasium was often used for other purposes (i.e., assemblies, music performances, etc.) and she, at times, had to cancel some of her lessons. In addition, her colleagues in the school do not consider physical education as an important subject in the curriculum and she has to spend a lot of time to "educate" them. She indicated:

... One of the bad things is [that] the gym is a total school use room. It's not just for teaching physical education so you're often combating scheduling problems and assemblies and everyone doesn't understand. Well, they just need to use the gym. Why can't they use it? They don't realize that there is a program going on. And every time we change principals there's another re-education of what happens in the gym because sometimes they're just coming, if they have not been a principal before, they're looking at how they had phys. ed. when they were younger or --- so you spend a lot of time in educating other people in your building but it's fun working with the elementary children. (Pre-Unit Interview, p. 2)
Anna is an elementary physical education teacher in a public school and has 18 years of teaching experiences, five years at the high school level and 13 at the elementary level. The last eight years she has been teaching at the same elementary school. Discussing her teaching experiences, she stated:

I started teaching in the high school at H.... High school so I have five years in high school and I taught for a few years, about five years at another elementary school and I've been here for about 8 years. So altogether I have about 18 years of experience. I have 13 years experience in elementary school. (Pre-Unit Interview, p. 1)

Working at the high school level was not a great experience for Anna. She indicated the hardest thing for her was the event that she was working with three other physical education teachers who did not share common programmatic goals. She explained:

My high school experience you worked with three other people, and it's hard to work with three people when you don't have the same goals. I found that towards the end I was department chair and it was hard because we had an elective program and the students should have been able to choose what they wanted. So when you went to the gym there should have been lots of activities going on. But depending on who the teachers were sometimes you just had maybe basketball going on and there should have been three different things so it was hard working with a group of teachers if they're not as professional as they should be. Most of them were coaches in the high school. I left for five years and then I came back to teaching after five years. I came back to elementary. (Pre-Unit Interview, p. 1)

Anna went on to point out that she preferred to teach at the elementary level. She noted "I really like teaching elementary physical education." The most enjoyable thing for her in the elementary level is the energy and passion of her students towards physical education and movement. She also indicated that she liked the fact that she had good facilities and ownership of the program. In her own words:
I like working with this age of children because the problem is not getting them to move. Sometimes it's getting them to calm down so you have an opposite problem with what you have in high school. Usually the energy is there. You just have to funnel it. I also like having my own gym and my own program. (Pre-Unit Interview, pp. 1-2)

The Physical Education Program

Anna stated that the major emphasis of her program was in the knowledge and execution of basic skills, fitness, and in the enjoyment of physical activities. She stated:

First of all I think that they [students] need basic skills, whether it be life skills but they need to have some basic skills. They need to know how to throw and catch, etc. They also need to know aspects of fitness although we don't do fitness for the sake of fitness here because, when you see the children only once every three days, you really are not impacting their fitness at all. So I just want them to know the aspects of fitness and really I want them to enjoy what they're doing so that it becomes a habit and if you enjoy what you're doing and you do it then you will be fit. Those are the three major things. (Pre-Unit Interview, p. 2)

She went on to indicate that in the primary grades the major emphasis of her program was on the development of the fundamental movements and cooperative behaviors. In the intermediate grades the emphasis was on the development of sports skills, fair-play behaviors, participation, development confidence, and enjoyment. She pointed out:

... In primary we're working on what they call the basic movement. The basic fundamentals, those types of things. We're working on just cooperating in small groups, those kinds of things but once they get into intermediate then we're more into the refereeing where they need to be able to set up their own game, run their own game so that, when they go outside at recess or whatever, they can participate in their own games in a sportsmanlike manner. ... Whatever sport we teach in intermediates, I just want them to be able to have the basic skills so that they can if they decide to pursue it, they have the basic skills to do that and also that they realize that, whatever level they're at, they can participate in my class. If you're not an expert athlete, you still can participate at your own level. So I think just so they feel confident about what they're doing and enjoy it. ... They
have to cooperate when they're referees or when they're players so when they get older I don't really call it so much cooperation as sportsmanship. (Pre-Unit Interview, pp. 2-3)

To the question whether she would have different programmatic goals, were she working in a different elementary setting, Anna responded that she would have similar goals. She stated:

I still think that these would still be my goals. Now here I realize we have a very good support system. We have kids that are pretty good. If they have problems we have a plan worked out dealing with these problems. Parents are very supportive so I'm able to pursue a lot of what I think the children should be doing. I know in other schools you have a lot of maybe discipline problems that would get in the way of what you're trying to do. I still think I'd have the same goals but I may not be able to meet them as well. (Pre-Unit Interview, pp. 3-4)

**The Volleyball Unit**

Anna indicated that in her school district the teachers could select the instructional units for their students from a variety of sports and activities included in the course of study. She also pointed out that the teachers had the freedom to define the length of the instructional units. She explained:

In our course of study, the teachers define the length of their unit. How long they want to do it. So we have, the way that we set our course of study up, a very big selection of sports and activities we can choose from. And this is mainly in the third, fourth and fifth grade. Then we have to make sure that we introduce like one body-oriented sport like gymnastics or dance - something like that. A striking activity, a throwing and catching activity, and a fitness activity. .... You could do however you want so it's left up to the teacher. (Pre-Unit Interview, p. 11)

Anna meets her classes every three school days and she structures her program around instructional units of varied length. She included two types of instructional units, the "long" and the short or "mini" units. She teaches three long units of about 12 to 14 lessons each, and several short or "mini" units of about 6 to 7 days each. She uses the mini units to either introduce a new
sport/activity or to help students retain sports skills already taught in the past. She typically teaches the same two long units, gymnastics and track and field, every year while she alternates the third one. In the following interview extract, she described how she decides about the nature of length of the units:

I do three sport education units that are very long units in the year. This year I did soccer, gymnastics and I’ll do track and field and we did acro-sport this year. Next year I’ll do three different units of the longer units but I still think in elementary it’s important to give them a lot of variety too and so I’m calling these, as mini units. I tell my students that these mini units are just to let you practice the skills and see if you like them and that kind of thing and to keep them refreshed. Because if you have a sport education unit one year and you don’t play it again they might forget everything. This is just sort of a little refresher course. I don’t know really how it works, if it really does help to refresh them but we’ll see. My gymnastics though always is a big unit because not that many students are able to take gymnastics and I alternate acro-sport with regulation — with events in gymnastics. So usually I always have a longer gymnastics unit and track and field, almost always, because we have a track meet at the end of the year and I think it’s really good. There’s always an activity that the students can work on, improve it and there’s an activity that they can do well in. Diversified. I usually always have those two and then the other ones I adjust so next year I think I’ll have a long stickball or lacrosse unit in the fall instead of soccer. So - maybe. We’ll see. (Pre-Unit Interview, pp. 10-11)

This study took place when the teacher taught a short volleyball unit to two classes. The first class was a fourth grade class and the second one was a fifth grade class. The length of the lessons observed for both classes was 40 minutes long. The length of the volleyball unit when this study was conducted included 4 lessons for the fourth grade class and 5 lessons for the fifth grade class. The main reasons that this mini unit included fewer lessons was the bad weather and other events in the school. Anna explained:

It would have been 6 or 7 [lessons] for the mini unit. ... We had a lot of snow days this year. We had 7 snow days and what happened was that they started it later. Then the fourth grade had their musical performance
which they had to practice for so that took out a whole rotation. (Post Unit Interview, p. 8)

The Students in the two Classes

Describing the students in her classes, Anna stated that in the fourth grade class she had 24 students. She indicated that there were a couple of students that had some behavioral problems. There were also a hearing impaired student and a multi-handicapped student who were integrated in this class. She noted:

My 4th grade only has 24 students. We have a couple students that could be very problem. We have one student that is on a school contract and in counseling and for any reason she could just go off and I don't think I have that in my fifth grade class. In my 4th grade class I have a hearing impaired student and a multi-handicapped student also. So the makeup of the classes is very different. (Pre-Unit Interview, p. 13)

There were a total of 27 students, and a couple of them were new, in the fifth grade class. Anna indicated that overall the students in this class work nicely together. She said:

My fifth grade class is a class that really works well together although they have a couple of new students. And they're my larger class. They are 27. So in that way they'll be a little bit different than the fourth grade class. (Pre-Unit Interview, p. 13)

Anna indicated that she knows well most of her students since she had them before. In her own words:

Most of the students I've had before. Some of them I've had seen them since kindergarten if they've been in the school the whole time. (Pre-Unit Interview, p. 14)

She pointed out that in general terms her classes are quite good "I think they're good classes. Just a couple of individuals could be not so good" (Pre-Unit Interview, p. 14).
RQ. 1. What instructional practices does an experienced physical education teacher employ in teaching volleyball to elementary students?

RQ. 1.1. What is the nature of the content and how is it structured and delivered through learning tasks?

Nature of Content Covered

Anna planned to cover the same content (skills and knowledge) in both classes and end her unit with a doubles "mini, quick tournament." Her goal for this unit was for her students to be able to play a doubles volleyball game and be able to officiate their games. In her words, "... I wanted them to be able to just play a doubles game and wanted them to know how to score and referee" (Post-Unit Interview, p. 1). She intended to cover the skills of serving, bumping, setting, and refereeing. Because the volleyball unit was short, however, she planned to place an emphasis on covering and practicing the basic skills of bumping and serving. As she stated, "I emphasize the serve and the bump and then I do introduce the set. But I'll emphasize, especially in the short unit, just the serve and the bump" (Pre-Unit Interview, p. 7). Anna did cover and emphasize the bump and the serve in both classes, but she did not introduce the set to the fifth grade class. She chose, though, to briefly introduce the set to the fourth grade class yet did not allocate much of the class time to practicing it except during the second lesson when she introduced it. The basic volleyball skills of blocking and spiking were not to be introduced and were not introduced to either of the classes. In terms of strategies, Anna intended to and did cover some simple strategic concepts in both classes. These concepts were to be
addressed during the course of the student participation in the game. As she stated:

As they're playing, ... I might say 'now, this time when you're playing your doubles game, I want one person to serve and I want the back person to take it with a bump up to the front person. So as they're playing, we'll start to introduce some simple strategies. (Pre-Unit Interview, p. 10)

Additionally, during the unit, the strategic concepts of placing the ball in an open space when serving, and serving low serves as opposed to high serves were also mentioned (Field Notes, Lesson #3).

In terms of knowledge about the rules of the game, Anna covered many of the volleyball rules pertaining to serving, net, boundaries, contact with the ball, and rotation. She also associated the rules of the game to refereeing. Anna had outlined the rules in a poster for her students as follows:

<table>
<thead>
<tr>
<th>Serve:</th>
<th>Must clear the net</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Back position serve</td>
</tr>
<tr>
<td></td>
<td>Call score before serving</td>
</tr>
<tr>
<td>Play:</td>
<td>3 hits on a side (no double hits)</td>
</tr>
<tr>
<td></td>
<td>Lines are in (ceiling is out)</td>
</tr>
<tr>
<td></td>
<td>Ball must bounce out</td>
</tr>
<tr>
<td></td>
<td>Hit on first bounce or on fly</td>
</tr>
<tr>
<td>Violations:</td>
<td>Illegal hit</td>
</tr>
<tr>
<td></td>
<td>Player touches net</td>
</tr>
<tr>
<td></td>
<td>Play not on feet</td>
</tr>
</tbody>
</table>

Referees calls:
- **Point:** Serving wins play
- **Side out:** Serving team put out, other team rotates for serve

**Game:** 15 points (ahead by at least two points) (Field Notes, Lesson #5)

The majority of the rules were the same with the regulation volleyball rules. However, there were few rules that were in place to facilitate these students'
play. For example, the students could bump an oncoming ball from a serve on
fly or after the first bounce, they could serve from the back court line up to
approximately 15 feet from the net, and they could only use the serve and the
bump when playing. The rules were reinforced by the teacher as well as the
student referees throughout the game play. Anna mentioned briefly during the
first lesson some facts about the game of volleyball with respect to its origin,
Olympic status, and its recreational function.

In summary, Anna did plan for and covered the same game skills and
knowledge to both classes. The only difference was when she briefly introduced
the set to the fourth graders but she did not spend much class time on practicing
it. The students in both classes were presented with the same strategies and rules
of the game. With the exception of three rules, all the rules resembled the
regulation volleyball.

Warm Up - Cool Down

All lessons in both classes started with the same warm up routine lasting
three minutes with the exception of the first lesson in which the warm up session
lasted 4:40 and 5:30 minutes for the fourth and fifth classes respectively. After
the first lesson, the teacher used an audiotape in which there was music for the
jumping and stretching exercises as well as a voice that instructed the students to
go through two volleyball related warm up drills. As soon as the students would
enter the gymnasium, they would go to their own home bases and start their
warm-up routine which was directed by the four leaders assigned by the teacher
for the entire unit. The warm-up exercises were the same in every lesson in both
classes and included mostly stretching drills. There were two drills related to the
volleyball content of the unit, the window drill and the bump drill, none of
which involved balls.
The window drill involved bending and stretching of the knees and arms as if the students were to set a volleyball ball in personal space. The students spent about 20 seconds of their warm up performing this drill. The second volleyball related warm up drill involved the bump. The audiotaped voice instructed the students to assume the bump position—bent knees, joined hands, arms stretched out in front—and slide four times to the left rhythmically and bend and stretch their knees once. The students had to perform the same to the right. This drill lasted for about 20 more seconds. During the warm up section, the teacher would typically spend the time confirming the presence or absence of students as it was reported by the four assigned captains. She would also offer feedback, prompts, or encouragement to the students as they performed their warm up routine.

Several times in the end of the lessons, there was a routinized, short, cool down period during which the students were asked to assume their original home base positions and perform a series of stretches. The stretches were shown by the four leaders who were located in front facing the rest of the class. This cool down period was unrelated to volleyball content, and, even though it did not take place in each lesson, it had the form of a routine since the students responded to the cue "cool down" in unison.

**Sequencing of Skills**

Anna introduced the same skills in the same order to both classes with one exception during the second lesson. She started the unit by introducing the bump to both classes. She differentiated, however, the content sequence between the two classes during the second lesson. While she chose to introduce the set to the fourth graders, she decided not to present it at all to the fifth graders. In justifying her decision to introduce the set to the fourth grade, Anna stated that
"The fourth grade was doing the bump so well that I thought oh, we'll do the set..." (Post Lesson Interview, Lesson #2). However, the fourth graders did not seem to perform as well the tasks when they were asked to use both the bump and the set in the same task, and especially in the two-hits cooperative game (see Table 12). According to Anna:

... they [the fourth graders] were trying to do the set and the bump and because they did not differentiate when to use the bump and when to use the set -they did not have much practice- they were not able to switch from one to the other and use it properly. (Post Lesson Interview, Lesson #2).

A reason for the lack of the competence to "switch" efficiently from one skill to the other was because the fourth graders "hadn't really had time to practice the bump in a game situation and get used to using it" (Post Lesson Interview, Lesson #1).

The fourth graders' performance on the set may have partially influenced the teacher's decision regarding the introduction of the set to the fifth grade class. At the end of the fourth grade class and right before the arrival of the fifth graders in the gymnasium, Anna mentioned that:

I am not going to introduce the set [to the fifth graders] until they play the game with the bump so they are using it successfully. In the fifth grade, I am not going to do the set; we are only going to do the serve and the bump. (Post Lesson Interview, Lesson #2)

Given that the fifth graders had received a long unit of volleyball the year before, I ventured to ask Anna whether the fifth graders would be more ready, and more successful in practicing and performing the set than the fourth graders. Anna explained that:

I had made a plan to go ahead and do the bump and, if I saw that they [fifth graders] were doing really well, then I would go ahead and introduce the set. But I did not think that they had enough control to add the set. They were still had some problems with controlling the bump. So
for the two-player [doubles] game, they can still play the game using the 
bump and the set and so that is what I am going to do. I want them to be 
able to play the game with control. (Post Lesson Interview, Lesson #2)

During the post lesson interview at the end of the fourth lesson, I asked 
Anna if she were going to introduce the set to the fifth graders in the remaining 
lesson. She responded:

I do not know if I would even hit [teach] the set this year. Because I want 
them to go on to their competitive game. That is really what they want to 
play. You know, it would be a shame to end my unit and not letting them 
have a chance at that competition at the end even though it would be at 
their skill level which is fine. I think they will find success; they are 
starting to find some success with their bump...". (Post Lesson Interview, 
Lesson #4)

It should be noted that, after the introduction of the set to the fourth graders 
during the second lesson, the set was not revisited at all throughout the rest of 
the unit.

After the introduction of the bump to both classes and the brief 
introduction of the set to the fourth graders, the teacher sequenced the content of 
the unit in the same manner in both classes. She went on to introduce the serve, 
the rules of the game and the strategic concepts (i.e., low serve, serve to an open 
space, back court player reception of the serve and bump pass to the front court 
player in the two on two modified game), and the officiating responsibilities in 
the exactly same order to both classes. Additionally, the tasks and/or game-like 
conditions used to introduce and/or practice the skills and knowledge of 
volleyball were the same. There were some differences between the time spent 
on the various tasks across the two classes as well as the timing of introducing 
the various skills and practice conditions/tasks to both classes.
Content Development

Several themes emerged from comparing the content development moves that the teacher chose to do during the unit. First, although the length of the unit was different for the fourth and fifth grade classes (the fourth graders had a four-lesson unit and the fifth graders had a five-lesson unit), both classes ended the unit by playing the same game of doubles with the same rules. Secondly, even though the fourth graders had a shorter unit than the fifth graders, they were introduced to an additional skill, the set, while the fifth graders were not introduced to the set. Third, the tasks the teacher chose for her pupils to practice in both classes were almost identical in terms of their goals and conditions of practice when the practiced skills were the same. In fact, there was only one task, the "keep it up using bumping in small groups" task that the fourth grade class practiced while the fifth did not. Finally, the timing of introducing the various skills and tasks differed from class to class with the fifth graders having had more time opportunity to practice the game skills. The following discussion centers around these themes.

The length of the unit was different between the two classes because one day the fourth grade class had to practice their musical performance. As the teacher said "... the fourth grade had their musical performance which they had to practice for, so that took out a whole rotation" (Post Unit Interview, p. 8). Despite the shorter unit, the teacher managed to progress the content for the fourth graders in such a way that they were able to experience all the tasks and game conditions designed by the teacher to introduce and practice the volleyball skills and knowledge. However, it seemed that the fourth graders may not have had the opportunity to practice and learn the content as much as the fifth graders did.
Anna, for example, moved the content through tasks that provided the opportunity to the students to practice the skills initially on individual basis and later in small groups condition. As soon as a skill was introduced and practiced to a degree considered adequate for the teacher and the goals of the unit, the teacher moved on into practicing the skills in game situations starting from cooperative game conditions and moving toward more competitive forms of play in which the students had the opportunity to practice their game skills and knowledge.

The teacher developed the content and structured the tasks in a patterned manner which was the same in both classes. For example, as soon as a new skill was introduced, the students were given the opportunity to practice few tasks individually first and then in small groups. These tasks typically focused on a single skill. As soon as the students exhibited control of the skill that was considered adequate for the teacher and for the goals of the unit, the teacher moved on into practicing the skills in game-like situations starting from simple forms of cooperative play and moving toward more competitive forms of play. A more detailed descriptions of the tasks and their progressions in both classes follows.

The teacher started the unit by introducing the bump to both classes. After the end of the warm up routine, the teacher proceeded by presenting the students of both classes with the same informing task which was followed by a series of extending and refining tasks (see Table 11). These tasks were similar in substance and structure in both classes. For example, the goals of all the tasks focused on the learning and improvement of the bump while the conditions of the tasks progressed from individual practice in personal space to practice in groups of two in confined space. In some tasks the teacher included a criterion
statement the students had to meet. This criterion was quantitative in nature in
that the teacher asked her students to perform the skill 2 or 3 times in a row. To
address the qualitative aspects of performance, Anna used critical elements and
prompted her students to perform "good" bumps. Additionally, she asked the
tossers to toss the ball only if their partner was in a ready position with their
knees bent. This was a way to hold the students responsible for quality
performance. To address the difficulty that some students had in bumping the
ball, Anna allowed her fifth graders to hit ball on the first bounce if they could
not hit it on its fly.

In addition to the informing, extending, and refining tasks employed,
there was only one applying task presented to the fourth graders at the end of
the class. The fourth graders participated in a "keep it up using bumping in
small circle" task for 1:55 minutes. The teacher did not have her fifth graders
practice this task at all because she thought of it as being a low activity task, and
because she perceived her fifth graders as having difficulty to focus on the
activities during this first lesson of the unit. She explained that:

The keep it up game in the end [of the fourth grade lesson] I do not think I
will do that. I tried to do that as an ending game, just to bring the team
back together, but there was not very much activity... I did not do it with
my fifth grade because my fifth grade was not very much focused. When
they came in, the captains did not put them in their home bases even
though they had the sheets and that set the tone for the whole class. They
were not really with it." (Post Lesson Interview, Lesson #1)

Spatial concepts, game rules, or other environmental arrangements such
as court positioning, use of nets or other related to the game of volleyball
elements were not addressed in any direct manner during the first lesson in
either of the classes. Although the task progression was more similar than
different in terms of the content development pattern in both classes, there were
few differences regarding the number and type of tasks as well as the student practice time. While the fourth graders were engaged in 9 tasks (1 I, 4 E, 3 R, and 1 A), the fifth graders were engaged in 7 tasks (1 I, 4 E, and 2 R). In terms of practice time, when excluding the time spent on warm up, the fourth graders spent 17:05 minutes practicing the learning tasks while the fifth graders spent only 12:05 minutes on the content related tasks. This difference of five minutes of practice time did not seem to be a function of the student nature of involvement and/or performance in the tasks assigned. The fifth grade class was shorter by 2:55 minutes than the fourth grade class. The rest of the time (2:05 minutes) was spent on instructional activities other than student practice (i.e., content presentation, transition, and management).
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm up routinized task</td>
<td>WRT</td>
<td>4:40</td>
<td>Warm up routinized task</td>
<td>WRT</td>
<td>5:30</td>
</tr>
<tr>
<td>Toss and bump to oneself in personal space</td>
<td>I</td>
<td>1:40</td>
<td>Toss and bump to oneself in personal space</td>
<td>I</td>
<td>1:55</td>
</tr>
<tr>
<td>Same but catch ball every two bumps</td>
<td>E</td>
<td>1:45</td>
<td>Same but do three good bumps in a row</td>
<td>E</td>
<td>2:50</td>
</tr>
<tr>
<td>Same but bend knees to get in ready position</td>
<td>R</td>
<td>1:15</td>
<td>Bump a tossed ball to the partner and earn a point</td>
<td>E</td>
<td>1:55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>each time the bump returns to tosser; switch every</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>five tosses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump a tossed ball to the partner and earn a point</td>
<td>E</td>
<td>2:30</td>
<td>Same but a) tosser should toss ball only if partner</td>
<td>R</td>
<td>2:55</td>
</tr>
<tr>
<td>the bump returns to tosser</td>
<td></td>
<td></td>
<td>is in ready position and, b) the bumper should move</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>his/her feet, not the arms, to get under the ball;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>switch every five tosses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same but toss ball higher to the partner</td>
<td>R</td>
<td>0:45</td>
<td>Same but bump back and front three times in a row</td>
<td>E</td>
<td>0:55</td>
</tr>
</tbody>
</table>

(To be continued)

Table 11: Content Development and Practice Time in Lesson 1 in the Fourth and Fifth Grade Classes
Table 11 (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same but a) tosser</td>
<td></td>
<td></td>
</tr>
<tr>
<td>should toss ball only if partner is in ready</td>
<td></td>
<td></td>
</tr>
<tr>
<td>position and, b) if needed, partner should</td>
<td></td>
<td></td>
</tr>
<tr>
<td>move to get under the ball</td>
<td>R</td>
<td>0:55</td>
</tr>
<tr>
<td>Bump back and front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with a partner three times in a row only if</td>
<td></td>
<td></td>
</tr>
<tr>
<td>each partner has scored three points in the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>previous task</td>
<td>E</td>
<td>1:10</td>
</tr>
<tr>
<td>Same as above, but</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with a new partner</td>
<td>E</td>
<td>5:10</td>
</tr>
<tr>
<td>Keep it up using bumps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in small groups -circle-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with captain in the middle</td>
<td>A</td>
<td>1:55</td>
</tr>
<tr>
<td>Total Practice Time:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forth Grade Class:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth Grade Class:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The second lesson was quite different for the two classes in terms of skills covered but not in terms of the nature and/or structural organization of the game-related progression of the tasks. For example, in the fourth grade the teacher reviewed briefly the bump and went on to introduce the set while in the fifth grade she allocated more time on reviewing and/or practicing the bump and introduced the serve toward the end of the lesson (see Table 12). In terms of the structural progression of the tasks, however, both classes seemed alike in that
the tasks chosen addressed and advanced the same conceptual understandings and actions in the game of volleyball.

The teacher's approach to developing the content for the set, which was introduced only to the four graders, was slightly different from that of developing the bump. For example, she did not have the students practice the set individually in personal space as she had them do the bump. Instead, she started the content development of the set by having the students work in pairs. Secondly, even though the focus of the task was on practicing the set, immediately after the informing task, the teacher gave the option to the students to bump or catch the ball if it was low. Later on in the lesson the "bump or set" option functioned clearly as the focus of the tasks. A final observation was that the teacher started the progression of the set by using a beach ball and later moved on to using a training volleyball ball. The fourth grade lesson moved into the two- and three-hits cooperative game where the students practiced and/or used the skills of set and bump in a game like condition that incorporated several elements of the game of volleyball.

The fifth graders spent more time engaged in tasks that focused on practicing the bump in groups of two than the fourth graders did. The lesson progressed into the same two- and three-hits cooperative game the fourth graders engaged in, but the fifth graders were instructed to use the bump only. It should be noted that the teacher, after the provision of instructions for the three-hits cooperative game, gave the option to the fifth graders to either practice the three- or two-hits cooperative game. Toward the end of the lesson, the teacher introduced the serve but the students did not spend much time on practicing it.

Despite the skill related differences in terms of the focus of several of the tasks in the two classes, there were several similarities in terms of the practice
time, type and number of tasks in the lessons, conceptual elements of the game advanced, and performance recording responsibilities/tasks assigned to the students. Both classes spent approximately half of the class time engaged in activity (20:45 and 19:20 minutes for the fourth and fifth grades respectively).

The fourth graders were presented with a total of 13 tasks while the fifth graders with 12. The length of the tasks ranged from 10 seconds to 3:05 minutes. Both classes were presented with similar types of tasks; for example, both classes practiced 1 informing, 5 applying, and 1 applying/refining tasks; additionally, the fourth graders were presented with 3 extending and 2 refining tasks, while the fifth graders were presented with 4 extending and 1 refining tasks. The students of both classes practiced the cooperative game in the same volleyball court positions, (i.e., the back and front court positions) and were asked to use the skill(s) and apply the rules of the game in the same manner that they would use them during a two on two modified volleyball game. Finally, the students of both classes were asked to observe and record another team's performance of the cooperative game and record the number of the successful tries.
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
</tr>
<tr>
<td>Bump to oneself once and catch. Every time there is success, attempt an additional bump and catch. Repeat as many times as you can.</td>
<td>A</td>
<td>2:10</td>
<td>Bump to oneself once and catch. Every time there is success, attempt an additional bump and catch. Repeat as many times as you can.</td>
<td>A</td>
<td>2:15</td>
</tr>
<tr>
<td>Set back and front with a partner. Catch the ball every three consecutive sets. Start with a toss. Use a beach ball.</td>
<td>I</td>
<td>1:15</td>
<td>Bump back and front with a partner (bump keep it up).</td>
<td>E</td>
<td>1:00</td>
</tr>
<tr>
<td>Same as above but use the finger pads not the palms of the hand. If ball is low either catch it or bump it.</td>
<td>R</td>
<td>1:05</td>
<td>Same as above. Safety issues addressed. (Rules for retrieving a ball were stated)</td>
<td>E</td>
<td>3:05</td>
</tr>
</tbody>
</table>

(To be continued)

Table 12: Content Development and Practice Time in Lesson 2 in the Fourth and Fifth Grade Classes
Table 12 (continued)

<table>
<thead>
<tr>
<th>Fourth Grade Class</th>
<th>Task Type</th>
<th>Time</th>
<th>Fifth Grade Class</th>
<th>Task Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as above but move to get under the ball; catch it if the ball is low</td>
<td>R 2:05</td>
<td>Two-hit cooperative task. Students in groups of two in one half volleyball court on one side of the net facing each other. The front court player (FCP) has his/her back toward the net and faces the back court player (BCP). FCP tosses to BCP who bumps to FCP who bumps to BCP who catch the ball (toss-bump-bump-catch). Students rotate positions after every attempted rally.</td>
<td>E 0:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as above. Use of training balls.</td>
<td>E 1:30</td>
<td>Same as above. Perform as many rallies as possible in 1 minute.</td>
<td>A 1:35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set and/or bump back and front with the partner. Catch in every 3 good hits. If the hit is bad catch and start again.</td>
<td>E 0:40</td>
<td>Same as above but rotate with refereeing teams (two-hits cooperative game)</td>
<td>E 1:10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(To be continued)
<table>
<thead>
<tr>
<th>Fourth Grade Class</th>
<th>Fifth Grade Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task</strong></td>
<td><strong>Time</strong></td>
</tr>
<tr>
<td>Bump back and front with a partner (bump keep it up).</td>
<td>E 1:30</td>
</tr>
<tr>
<td>Same as above but count the number of successful rallies (each successful rally corresponds to a cooperation point)</td>
<td>A 1:30</td>
</tr>
</tbody>
</table>

Two hits cooperative game. Students in groups of two, one front court player with his/her back to the net (FCP) and one back court player (BCP) facing his/her partner in one half of a volleyball court. The FCP tosses to BCP who bumps it to the FCP who bumps or sets to BCP who catch the ball. (Toss, bump, set/bump and catch) Perform as many rallies as possible in 1 minute. Each successful rally corresponds to a cooperative point. | A 1:05 |

Same as above but rotate positions (2 hits cooperative game) | A 1:15 |

Same as above but rotate with refereeing teams (3 hits cooperative game) | A 0:15 |

Same as above but rotate with refereeing teams (2 hits cooperative game) | A 1:05 |

Same as above but emphasis of using the legs and follow through | A/R 1:15 |

(To be continued)
Table 12 (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as above but rotate positions.</td>
<td></td>
<td></td>
<td>Serving against a target on the wall (groups of two)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emphasis on good bumps (2 hits cooperative game)</td>
<td>A/R</td>
<td>2:05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three hits cooperative game. Same as the two hits cooperative game but instead of catching the ball, the BPC bumps or set it over the net (toss, bump, set/bump, and bump/set over the net)</td>
<td></td>
<td></td>
<td>Same as above but hold the ball lower and contact ball more behind it and less underneath it.</td>
<td>R</td>
<td>0:10</td>
</tr>
<tr>
<td>Same as above rotate players positions (3 hits cooperative game)</td>
<td>A</td>
<td>1:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool down routine task</td>
<td>CDT</td>
<td>0:30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Practice Time: 20:45  
Total Practice Time: 19:20

The third lesson was more similar than different for the fourth and fifth classes in terms of the number of tasks (i.e., 8 and 7 respectively), types of tasks (i.e., II, 1E, 1R, 4A and 1RT, and 1E, 1R, 4A and 1RT respectively) and skills practiced (i.e., the bump and serve) through the tasks assigned (see Table 13). Both classes started with a review task which the students had already practiced in previous lessons and which addressed the skill of bump. There were two differences, however, concerning the initial review task. The first was that the task assigned to the fourth graders involved partner work while the one assigned to the fifth graders involved individual work. The second difference was with
respect the amount of time the teacher allowed for the practice of the review
tasks. While the fifth graders spent 1:05 minutes on the review task, the fourth
graders spent 5:25 minutes or 28% of the practice time the fourth graders had in
the entire lesson. The rest of the fourth grade lesson was used for the
introduction, practice, and learning of the underhand serve in various task
conditions, including a serving game. All the tasks the fourth graders were
assigned required the use of a single skill, either the bump or the serve.

The fifth graders practiced the serve in the same task conditions as the
fourth graders did. The difference between the two classes concerning the
practice of serving during this lesson lied with the number of tasks and amount
of time the students spent engaged in them. The fourth graders, for example,
practiced the serve in 7 tasks (II, 1R, 1E, 2A, and 1A/R) for 9:55 minutes, while
the fifth graders practiced the serve in 4 tasks (1E, 1R, and 2A) for 4:55 minutes.
The only difference between the two lessons in terms of the nature of the tasks
was that the fifth graders were introduced to a doubles game involving the
practice of serve and bump at the same time. During the doubles game the fifth
graders were also practicing their refereeing skills. A noticeable difference
between the two classes was the allocated practice time students spent on their
tasks. While the fourth graders were involved in practice for 19:05 minutes, the
fifth graders spent 14 minutes on practicing the tasks. Time data indicated that
3:45 of the 5:05 minutes difference was spent on transition. Although one would
expect that considerable portion of the time difference would be attributed to
instruction since the teacher took the time to describe the doubles game and
introduce several game rules, it was not the case. In fact, the teacher spent less
time on instruction with the fifth graders -17:30 minutes- than she did with the
fourth graders -18:25 minutes (see Tables 18 and 19).
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
</tr>
<tr>
<td>Bump back and front with a partner and catch</td>
<td>RT</td>
<td>5:25</td>
<td>Bump to one self in personal space</td>
<td>RT</td>
<td>1:05</td>
</tr>
<tr>
<td>the ball every three consecutive bumps. Start</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with a toss.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve against the wall</td>
<td>I</td>
<td>1:25</td>
<td>Serve on a target against the wall (groups of</td>
<td>E</td>
<td>1:10</td>
</tr>
<tr>
<td>on a target (groups of two)</td>
<td></td>
<td></td>
<td>two). Take a step farther if you hit the target</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 times in the row</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as above hold the ball lower</td>
<td>R</td>
<td>1:30</td>
<td>Same as above but contact ball with the heel</td>
<td>R</td>
<td>1:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>of the palm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(To be continued)

Table 13: Content Development and Practice Time in Lesson 3 in the Fourth and Fifth Grade Classes
Table 13 (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Fourth Grade Class</th>
<th>Fifth Grade Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as above but take a step farther if you hit the target 3 times in the row</td>
<td>E 1:10</td>
<td>Serving game: 2 teams of two across the net, one ball per team. Back line players serve across the net to an open space or to a weak player. Players on the other side of the net should catch the oncoming serve. If the ball is caught, the receiving team earns a point. If the ball lands in an open space the serving team earns a point. Only the back line players can serve. A 1:10</td>
</tr>
<tr>
<td>Serving game: 2 teams of two across the net, one ball per team. Back line players serve across the net to an open space or to a weak player. Players in the other side of the net should catch the oncoming serve. If the ball is caught the receiving team earns a point. If the ball lands in an open space the serving team earns a point. Only the back line players can serve.</td>
<td>A 0:50</td>
<td>Doubles games. Two on two volleyball game in one half regulation court. Regulation volleyball rules apply except: a) use only the skills of serve and bump, b) serve can take place from the back line up to 15 feet from the net, and c) players can bump the ball after a bounce A 1:50</td>
</tr>
</tbody>
</table>

(To be continued)
### Table 13 (continued)

<table>
<thead>
<tr>
<th>Fourth Grade Class</th>
<th>Time</th>
<th>Fifth Grade Class</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as above safety issues addressed -how to retrieve a ball</td>
<td>A 1:05</td>
<td>Same as above but rotated referees and reminded students about how to score</td>
<td>A 2:35</td>
</tr>
<tr>
<td>Same as above but rotation of back and front line players</td>
<td>A 1:10</td>
<td>Cool down routinized task</td>
<td>CDR 0:35</td>
</tr>
<tr>
<td>Same as above but hold the ball lower when serving and avoid hitting the ball hard</td>
<td>A/R 2:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool down routinized task</td>
<td>CDT 0:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Practice Time:</strong></td>
<td><strong>19:05</strong></td>
<td><strong>Total Practice Time:</strong></td>
<td><strong>14:00</strong></td>
</tr>
</tbody>
</table>

The fourth lesson was similar for both classes in terms of the skills and tasks practiced. Both classes practiced the skills of bump and serve independently from each other, and both classes finished the lesson playing the doubles game which involved the bump and the serve. The nature of the tasks used in both classes were similar in that the goal and conditions of the tasks were the same with one exception. While the fourth graders practiced the serve across the net only, the fifth graders practiced the serve across the net and against the wall. There was a difference in the number of the tasks the two classes were engaged in (i.e., 5 and 7 tasks for the fourth and fifth grades respectively), but these differences were not substantial in that the goals of the two additional tasks were the same for both classes while the structure of one of the tasks -serving against the wall- was different. The types of the tasks were similar in that both
classes experienced review, extending, and applying tasks. The differences in the type of tasks used was that, a) the fourth graders practiced a refining task while the fifth graders practiced a task that was coded as extending/refining, b) the fourth graders practiced one review task while the fifth graders practiced two, and c) the fourth graders practiced 2 applying tasks while the fifth graders practiced 3. Although, there was a difference in the time allocated for the practice of the bump and serve in both classes, it was not considered substantial. The fourth and fifth graders spent 3:10 and 3:30 minutes on practicing the bump and 5:20 and 5:55 minutes on practicing the serve respectively (see Table 14). On the other hand, the difference in the allotted time for practicing/playing the doubles game was considerable since the fourth graders spent a total of 8:15 practicing it while the fifth graders spent a total of 11:20 on it. Finally, there was a difference in the organization of students for practicing the serve in the fifth grade. The teacher had one group of students -one half of the class- practice the serve against the wall and the other half practice the serve across the net. Then she switched the students. It was the only time during the unit that the teacher organized students for practice in such a manner. Field notes indicated that when the fourth graders practiced the serve with their partners across the net, there was considerable interference among the groups since many serves were not directed accurately to the target partners standing across the net. The degree of interference was less with the fifth graders during the practice of serve since one half of the class served the ball against the wall and the other half across the net (Field Notes, Lesson # 4).
<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
<td>Warm-up routinized task</td>
<td>WRT</td>
<td>3:00</td>
</tr>
<tr>
<td>Bump back and front with a partner and</td>
<td>RT</td>
<td>3:10</td>
<td>Bump back and front with a partner and</td>
<td>RT</td>
<td>2:20</td>
</tr>
<tr>
<td>catch the ball every three consecutive</td>
<td></td>
<td></td>
<td>catch the ball every three consecutive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bumps. Start with a toss.</td>
<td></td>
<td></td>
<td>bumps. Start with a toss.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serving across the net with a partner. One</td>
<td></td>
<td></td>
<td>Same as above but</td>
<td></td>
<td></td>
</tr>
<tr>
<td>person serves and the other catches it from</td>
<td></td>
<td></td>
<td>make sure you a) go</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the other side of the net. If ball is caught</td>
<td></td>
<td></td>
<td>under the ball and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>while taking one step from the home base a</td>
<td></td>
<td></td>
<td>communicate with your</td>
<td></td>
<td></td>
</tr>
<tr>
<td>point is earned. Every 3 serves</td>
<td></td>
<td></td>
<td>teammates - call for the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>caught, move a step back.</td>
<td>E</td>
<td>1:55</td>
<td>ball</td>
<td>E/R</td>
<td>1:10</td>
</tr>
</tbody>
</table>

(To be continued)

Table 14: Content Development and Practice Time in Lesson 4 in the Fourth and Fifth Grade Classes
<table>
<thead>
<tr>
<th>Task</th>
<th>Fourth Grade Class</th>
<th>Fifth Grade Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as above but focus on following</td>
<td></td>
<td></td>
</tr>
<tr>
<td>through to the partner</td>
<td>R</td>
<td>Two concurrent tasks:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A) Serving across the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>net with a partner. One</td>
</tr>
<tr>
<td></td>
<td></td>
<td>person serves and the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>other catches it from the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>other side of the net.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Every 3 serves caught</td>
</tr>
<tr>
<td></td>
<td></td>
<td>move a step back.</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>3:25</td>
<td>2:45</td>
</tr>
<tr>
<td>Doubles games. Two</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on two volleyball game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in one half regulation court. Regulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>volleyball rules apply except:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) use only serve and bump, b) serve can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>take place from the back line up to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 feet from the net, and c) players can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bump the ball after it bounces</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:50</td>
<td></td>
</tr>
<tr>
<td>Same as above but</td>
<td></td>
<td></td>
</tr>
<tr>
<td>refereeing teams</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>replace playing teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:25</td>
<td></td>
</tr>
<tr>
<td>Same as above but</td>
<td></td>
<td></td>
</tr>
<tr>
<td>refereeing teams</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>replace playing teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:50</td>
<td></td>
</tr>
<tr>
<td>Same as above but</td>
<td></td>
<td></td>
</tr>
<tr>
<td>refereeing teams</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>replace playing teams</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:35</td>
<td></td>
</tr>
<tr>
<td>Cool down routine task</td>
<td>CDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:40</td>
<td></td>
</tr>
<tr>
<td>Total Practice Time:</td>
<td>19:45</td>
<td></td>
</tr>
<tr>
<td>Total Practice Time:</td>
<td>24:25</td>
<td></td>
</tr>
</tbody>
</table>
There was only one class that had a fifth lesson in volleyball, the fifth grade. The teacher started this fifth and final lesson in the unit by having the students practice two review tasks addressing the bump and serve and one refining task focused on serving (see Table 15). The rest of the practice time was devoted to two pre-game drills and two doubles games. The students spent a total of 9:15 minutes playing their final doubles game in this lesson. The total allocated practice time in the fifth lesson was 24:15 minutes.
<table>
<thead>
<tr>
<th>Fourth Grade Class</th>
<th>Fifth Grade Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>Type</td>
</tr>
<tr>
<td>Warm-up routinized task</td>
<td>WRT</td>
</tr>
<tr>
<td>Serving across the net with a partner. One person serves and the other catches it from the other side of the net. Every 3 serves caught the partners move a step back.</td>
<td>RT</td>
</tr>
<tr>
<td>Same as above but follow through to the partner</td>
<td>R</td>
</tr>
<tr>
<td>Pre-Game Serving Drill: Two teams of two across the net, one ball per team. Back line players serve across the net to an open space or to a weak player. Players on the other side of the net catch the oncoming serve alternatively.</td>
<td>E</td>
</tr>
<tr>
<td>Doubles Games (as in previous lessons)</td>
<td>A</td>
</tr>
</tbody>
</table>

(To be continued)

Table 15: Content Development and Practice Time in Lesson 5 in the Fifth Grade Class

138
Table 15 (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Type</th>
<th>Time</th>
<th>Task</th>
<th>Type</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Game Serving Drill:</td>
<td>E</td>
<td>2:15</td>
<td>Doubles Games (same as earlier)</td>
<td>A</td>
<td>4:35</td>
</tr>
<tr>
<td>(Same as earlier.) The task was repeated because students rotated roles - refereeing and playing teams.</td>
<td></td>
<td></td>
<td>Cool down routinized task</td>
<td>CDT</td>
<td>1:00</td>
</tr>
</tbody>
</table>

Total Practice Time: Total Practice Time: 24:15

In summary, the content development for the volleyball unit was similar for both classes. The teacher progressed the content in the fourth grade using 3 informing tasks, 9 extending, 7 refining, 12 application, 2 review tasks and 2 applying/refining tasks, a total of 35 tasks. The fifth grade, on the other hand, engaged in 2 informing, 13 extending, 5 refining, 14 applying, 5 review tasks, 1 extending/refining, and 1 applying/refining, a total of 41 tasks - six tasks more than the fourth grade. The fourth grade engaged in 7 refining tasks, 2 more than the fifth grade class, while the fifth grade engaged in 13 extending tasks, 4 more than the fourth class. The total number of extending and refining tasks for the fourth and fifth grades was 16 and 18 respectively. The most tasks both classes were engaged in were the applying tasks, 12 and 14 for the fourth and fifth classes respectively.
The fourth graders spent a total of 81:20 minutes or approximately 50% of the class time engaged in practice including the warm up and cool down sessions in four lessons. The practice time per lesson in the fourth grade ranged from 19:05 to 21:45 minutes. The fifth graders spent a total 99:35 minutes or approximately 50% of the class time engaged in practice including the warm up and cool down sessions. The practice time in the fifth grade ranged from 14 to 24:25 minutes per lesson.

The type of the tasks used as well as their nature in terms of the goals and conditions of practice was similar for both classes. These tasks addressed three skills two of which, the bump and the set, were introduced and constituted the primary focus of the unit in both classes. Although the fourth grade was introduced to set during the second lesson in the unit, they did not practice beyond the initial introduction since the teacher decided to focus both classes on the bump and serve. The students of both classes were presented with the same exactly strategies and rules; the strategies, however, were not a focal point for the unit. The tasks that were not of game-like nature required the practice of a single skill (i.e., bump or serve only) except for several tasks during the second lesson for the fourth graders. With the exception of the first lesson for the fifth graders, all lessons for both classes included and finished with the practice of applying tasks, most of which were frequently modified volleyball games. Both classes ended the unit with a doubles volleyball game. When engaged in the game-like tasks, pupils of both classes were also engaged in refereeing responsibilities.

Time Distribution and Patterns of Instructional Practices

To acquire a sense of how time was allocated during the lessons, several categories of classroom practices were considered, including instruction, transition, student practice, and management. The category 'instruction'
consisted of three subcategories, including, a) teacher description, explanation, and/or demonstration of the tasks, b) pupil only and or pupil/teacher demonstration, and c) teacher feedback to the entire class immediately after the student practiced a task. A total of four lessons, two for the fourth and two for the fifth grade - the second and third lessons in the unit - were systematically coded for this purpose.

The time analysis revealed that student practice time and instruction were the two categories that most of the class time was spent on. The student practice time in the second and third lessons in the fourth grade was 49% and 44% and for the fifth grade 50% and 35% (see Tables 16-19). The 35% practice time in the third lesson of the fifth grade was not typical occurrence since most of the time the students of both classes spent an average of about 50% of the class time engaged on tasks. These time data indicated that the students of both classes spent considerable time practicing the tasks.

The instruction time, including all three subcategories, in the fourth grade was 34% and 42% in the second and third lesson respectively and for the fifth grade 34% and 43%. The teacher took time to describe, explain, and demonstrate the skills and the tasks to the students as well as to review the skills. Additionally, she used student demonstrations to provide the pupils with a more clear understanding of the tasks to be performed. Finally, during the task presentation, she asked her students several questions which might have added to the instructional time. According to the data the teacher provided clear class feedback immediately after student practice of a task several times during the lesson (see Tables 16-19). However, sometimes the class feedback was embedded in the next task statement in such a manner that it was difficult to be coded in terms of time the teacher spent on this instructional category. It at times seemed
as though the class feedback at the end of student practice of a task was implied by the teacher's statement of the next task. For example, based on the students' performance on a task involving serving, the teacher, instead of providing feedback to the students about their performance, went ahead to state a refining task directing the students to "hold the ball lower." It could be speculated that the statement of the refining task replaced a class feedback statement. In this case, the category of class feedback at the end of student practice of a task was not coded because it would violate the definition of the category.

The time spent on transition in the fourth grade was 16% and 12% in the second and third lessons respectively and in the fifth grade 15% and 23%. The teacher did transition her students frequently during the lessons for the purposes of relocating them in the gymnasium, changing partners, rotating roles, and acquiring or leaving equipment. The length of the transitions varied ranging from 5 seconds to 2:00 minutes. Transitions involving management of equipment, changing partners, or rotating positions were short while transitions involving getting with a partner, and game or referee organization took longer. No matter whether they were short or longer, all transitions were well organized and monitored indicating strong organizational and supervising teaching competencies. This observation is well supported by the fact that management time never exceeded 1% in any of the lessons in both classes. It was also shown that the managerial events were infrequent, very short, and crisp in nature.

The time distribution Tables 16-19 was constructed in such a manner as to provide information about how the teacher sequenced class event so that instructional patterns could be identified either within or across classes regarding various segments of the lessons such as the beginning of a class, the introduction of a new skill or task, the practice of a sequence of tasks, the review or practice of
an already introduced skill or task and so on. The teacher exhibited particular patterns of teaching behaviors when introduced a new skill for first time. For example, following the warm-up session, the teacher always started the lesson with assigning the students a task involving the practice of bump. When looking at the Table 16, for example, after the presentation of a new skill, the set, to her students, the teacher tended not to transition students for several tasks; instead the pattern exhibited was task presentation alternated with student practice of the task for a sequence of five tasks. Another observation indicating a pattern was that all the times the teacher introduce a game play condition (i.e., the cooperative play in the second lesson for both classes, the serving game in the third lesson for both classes, and the doubles game in the third lesson in the fifth grade class only), the teacher spent more time to explain the task and there was always a student demonstration involved. A final observation was that in both classes, when there was a shift in the task in terms of structure (e.g., bumping with a partner, cooperative game in one half court, serving game across the net, and so on) the task structure did not change for at least two consecutive tasks, and most of the times there was no transition between the two consecutive tasks. These teaching moves or patterns appeared consistently in all lessons in the unit and they constituted characteristics of the teaching practices exhibited by this teacher.
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bump</td>
<td>1:30</td>
<td>0:15</td>
<td>2:10</td>
<td></td>
<td></td>
<td>3:00</td>
</tr>
<tr>
<td>Set</td>
<td>1:35</td>
<td>0:35</td>
<td>0:40</td>
<td>1:15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:55</td>
<td>1:05</td>
<td>0:05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:35</td>
<td></td>
<td>2:05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:50</td>
<td>1:30</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>0:45</td>
<td></td>
<td>0:40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:05</td>
<td></td>
<td>1:30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0:10</td>
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<td></td>
<td></td>
<td>1:55</td>
<td>0:45</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0:15</td>
<td>1:20</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>0:30</td>
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<td>0:10</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1:00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump/S</td>
<td>0:05</td>
<td></td>
<td>1:05</td>
<td>0:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump/S</td>
<td></td>
<td>0:10</td>
<td>1:05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0:30</td>
<td>2:05</td>
<td>0:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0:40</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>0:15</td>
<td>0:15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(To be continued)

Table 16: Time Distribution in Lesson 2 in the Fourth Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice.

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback.
Table 16 (continued)

<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bump/S</td>
<td>0:15</td>
<td></td>
<td></td>
<td>1:00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump/S</td>
<td></td>
<td>0:05</td>
<td>0:30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>0:40</td>
<td>0:30</td>
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<tr>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Time %</td>
<td>34% **</td>
<td>16%</td>
<td>49%</td>
<td>1%</td>
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<td>Teacher Descript. Demo</td>
<td>Student/Teacher Demo</td>
<td>Transition</td>
<td>Student Practice</td>
<td>Post-task feedback</td>
<td>Management</td>
</tr>
<tr>
<td>-------</td>
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<td>------------</td>
<td>------------------</td>
<td>-------------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>2:00</td>
<td></td>
<td>0:10</td>
<td>2:15</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:20</td>
<td>0:45</td>
<td>1:00</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:40</td>
<td></td>
<td>3:05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0:35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 0:55</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:50</td>
<td>0:45</td>
<td>0:45</td>
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</tr>
<tr>
<td>Bump</td>
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<td></td>
<td>1:35</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bump</td>
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<td>1:05</td>
<td>1:10</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td></td>
<td>0:15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:10</td>
<td></td>
<td>1:30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:15</td>
<td></td>
<td></td>
<td>0:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>0:20</td>
<td>0:30</td>
<td>1:50</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td></td>
<td>0:25</td>
<td>0:15</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>1:10</td>
<td></td>
<td>1:15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0:35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>2:25</td>
<td>0:15</td>
<td>1:30</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:40</td>
<td>0:10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>0:40</td>
<td></td>
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<td></td>
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<td>0:20</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 17: Time Distribution in Lesson 2 in the Fifth Grade Class

Key

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bump</td>
<td>1:15</td>
<td>0:15</td>
<td>0:40</td>
<td>5:25</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>2:45</td>
<td>0:25</td>
<td>1:25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>1:40</td>
<td></td>
<td>1:30</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:20</td>
<td></td>
<td>0:40</td>
<td></td>
<td></td>
<td>1:10</td>
</tr>
</tbody>
</table>

|       | 2:35                   | 1:15                 | 0:10       |                 |                    |            |
|       | 2:15                   | 0:20                 |           |                 |                    |            |
|       | 0:55                   | 0:20                 |           |                 |                    |            |
| Serve | 0:40                   |                      | 0:50       |                 | *                  |            |
| Serve | 0:30                   |                      | 0:20       |                 | 1:05               | 0:10       |
| Serve | 1:55                   |                      | 1:10       |                 | 0:10               |            |
|       | 1:45                   | 0:45                 |           |                 | 0:15               |            |
| Serve | 0:05                   | 2:45                 | 0:45       | 0:45            | 0:25               |            |
|       |                        |                      |            |                 |                    |            |
| Total |                        |                      | 0:50       |                 |                    |            |

**Table 18: Time Distribution in Lesson 3 in the Fourth Grade Class**

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback
<table>
<thead>
<tr>
<th>Skill</th>
<th>Teacher Descript. Demo</th>
<th>Student/Teacher Demo</th>
<th>Transition</th>
<th>Student Practice</th>
<th>Post-task feedback</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bump</td>
<td>0:05</td>
<td>0:10</td>
<td>1:05</td>
<td></td>
<td></td>
<td>3:00</td>
</tr>
<tr>
<td>Serve</td>
<td>2:35</td>
<td>0:20</td>
<td>1:10</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:15</td>
<td></td>
<td></td>
<td>1:30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0:25</td>
<td>0:35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:45</td>
<td>0:20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>0:40</td>
<td>0:35</td>
<td>1:05</td>
<td>*</td>
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Table 19: Time Distribution in Lesson 3 in the Fifth Grade Class

**Key**

* Indicates the presence of feedback statements contained in the descriptions and/or explanations provided to the whole class following student practice

** Indicates percentage of total time spent on instruction including teacher's descriptions and demonstrations, student/teacher demonstration, and post-task feedback
Summary

Anna taught the skills of serve and forearm pass. She also covered the rules of the game as well as officiating skills. In developing the content, she used a variety of task types including informing, extending, refining, applying and review tasks. She used more extending and applying tasks in her fifth grade class and more refining tasks in the fourth grade class. Both classes spent approximately one half (50%) of the class time engaged in practice including the warm up and cool down. There was no difference between the two classes in terms of the content covered and the general pattern of content progression. Both classes ended the unit with a doubles volleyball game. When engaged in the game-like tasks, pupils of both classes were also engaged in refereeing responsibilities.

RQ 1.2. How do the teachers communicate the tasks to the students and interact with them.

Task Communication

The teacher used a variety of techniques to communicate the content to the students, including descriptions, explanations, and demonstrations of the tasks. She described the tasks in a simple and straightforward fashion, provided reasons as to why a skill or particular aspect of the movement was to be performed in a specific manner, and offered both teacher and student demonstrations to facilitate her pupils' understanding of how a skill or task was to be performed. When a task addressed a skill or a game-like situation that the students had not encountered before, the actual description of a task was preceded by a brief segment of content presentation that focused on the components of the skill or the rules and/or components of the game-like
situation. Following this brief overview of the new skill or game-like situation, a sequence of tasks that developed progressively followed which provided the context in which the students practiced and learned the content or substance of the unit. Additionally, the choice of tasks itself, as well as the organizational arrangements of the class, were such as to facilitate and enhance the pupils learning opportunity and experience and minimize potential sources of distraction to learning.

When presenting a skill or game-like task for first time or when reviewing a skill, Anna took some time to describe, explain, and or demonstrate the skill. With one exception, all the times she presented a new skill or a new game-like task, she had the students of each of the two large groups of the class sit down next to each other in two rows facing each other along the basketball half-court line. The teacher stood at the end of the two lines formed by the students and started presenting the new skill. On the other hand, when presenting a task with which the students were familiar in terms of its condition and/or general nature, the teacher stopped the class and instructed the students while they were dispersed in their own space.

The task presentation was predominantly interactive. There were, however, instances in the unit that a presentation of a task consisted of a teacher description and did not contain the interactive element. When a task addressed a new skill or a new game-like condition, the presentation was always interactive in nature. The teacher always started the new skill presentation by offering a reason for the skill and continued by asking the students a question(s) regarding the critical elements of the skill(s) introduced. Since the students of both classes had received a volleyball unit during the year before, there was an underlying assumption or expectation that they might remember some of the critical
elements, which they did since many of them raised their hands and provided
their responses (Field Notes, Lesson #2). The students responded to the teacher's
questions by stating a critical element. The teacher followed the student
response by repeating it to the class and/or re-phrasing, completing, and/or
offering a short explanation in a way that addressed the critical element
qualitatively more completely. This process of skill presentation was patterned
in that it followed a specific sequence; for example, the teacher's question was
followed by a student's response which was followed by a teacher description or
explanation accompanied by a demonstration when deemed appropriate; the
circle would start again with the teacher asking another question (see excerpts
below).

Anna always demonstrated the skills presented to both classes. The
delivery of the demonstration was progressive in that it was presented initially in
a segmented manner and later in a complete manner. For example, as soon as a
student came up with a critical element, the teacher first repeated it or rephrased
it and then offered a demonstration of the specific critical element. The following
two excerpts provide an illustration of the content presentation process in terms
of the interactive pattern and partial skill demonstration:

Teacher: We are going to do the serve because next time, when you come
in, we are going to play the doubles game and in order to do
that we need to have our serve. Who remembers when we did
the underhand serve last year? What are the things you have to
do to do a good underhand serve?
Student: Swing your hand back.
Teacher: You are going to swing your hand back using an underhand
throwing swing but instead of throwing you're hitting. (Field
Notes, Lesson #2)

As the teacher expanded the student's response, she demonstrated the back
swing of the arm for three consecutive times. She had assumed a serving like
position and held a ball in her non-serving arm. And even though in order to achieve the three consecutive back swings she had to swing her arm forward three times, she directed the students' attention to the backward motion of the arm. The focal point of that particular moment of the demonstration was on one critical element, the back swing (Field Notes, Lesson #2). The interaction and the demonstration of the serve continued as follows:

Teacher: OK! What else do I have to do?
Student: You've got to hold the ball in your hand.
Teacher: You are going to hold the ball on the palm of your hand, with the palm under the ball. OK. We have the swinging arm pattern so I am looking like this. (Field Notes, Lesson #2)

As the teacher was verbalizing, "You are going to hold the ball on the palm of your hand, with the palm under the ball," she lowered the ball at about waist level and held the ball at this level for about 1 to 2 seconds without moving any part of her body. Then as she was saying "we have the swinging arm pattern so I am looking like this" she swung her arm back and front without hitting the ball for three consecutive times. Next, the teacher elicited two responses by a student about the "hit through the ball" and the "follow through to the target" critical elements but did not offer any elaboration or explanations. The following excerpt portrays how the communication of the skill and the demonstration continued:

Teacher: What else [do I have to do to serve]?
Student: Take a step forward
Teacher: OK, I am going to take my step forward; [I] use my legs to bend and stretch (she shows).
Teacher: What do I look at?
Student: The ball
Teacher: Yes, you are watching the ball because that is what your are hitting. (Field Notes, Lesson #2)
This exchange followed the same pattern of interacting through questioning, responding, and demonstrating a single or isolated critical element of the skill. The teacher focused the students' attention on one critical element at a time matching precisely the statement of the specific cue with the specific movement or body position involved.

The partial demonstration of the skill was followed by the whole demonstration of the skill. The teacher stood about 12 feet from the wall, facing it, in order to demonstrate the serve. She aimed at a target placed on the wall at about regulation volleyball height net and attempted the demonstration. As the teacher assumed the serving position and was about to hit the ball, she started saying to the students "So I am going to be watching the ball and I am going to go for that red target" while at the same time as she was verbalizing the action, she executed a serve against the red target on the wall. She caught the returning ball and immediately assumed the serving position again. It seemed as though she was going to perform a second full demonstration, but she did not. While in the serving position, she said "Swing back - step - swing through to the red target" and executed the swing of the serving arm back and front but did not contact the ball; it was a partial demonstration. Following this partial demonstration the teacher stated the task which contained, "When I say go, find a new partner find a target and start practicing; ready, get set, go." It was apparent that this task statement capitalized on and reflected the fact that the students were familiar with the managerial processes and the environmental characteristics of the gymnasium that were previously described to the students.

Interactive task presentation took place not only when the students were gathered but also when they were dispersed in the gymnasium. The nature of the interaction during such cases contained usually a teacher comment followed
by a question which elicited a student response that was followed by a teacher statement of the task. The following excerpt depicts an example that illustrates the task presentation while the students were dispersed in the gymnasium. The students were practicing the serve against the wall. The teacher seemed to be concerned with the high serves of the students:

Teacher: Now, if you are hitting the ball and goes straight up in the air; it is too high. What can you tell your partner to help them?

Student: Hold the ball down lower.

Teacher: Hold the ball lower. You are hitting underneath the ball not to making it go straight up. That is what you want to do with our bump but for the serve, you want the ball to go out and up. So hit behind it more by holding the ball lower. Ready get set go.

(Field Notes, Lesson #3)

This task presentation included a partial demonstration, in that, as the teacher was describing what the students had to do, she was also showing to the students the motion of the arms. However, there was no ball involved. When communicating the tasks to the pupils, the teacher used two modes of communicating, the verbal which included descriptive and explanatory statements, and the visual, through demonstrations. The content of the task descriptions contained information reflecting three central components. For example, a task description included information about the elements of the skill or the game (i.e., what was to be performed and how). It also contained information about the environmental conditions under which a task was to be performed (e.g., whether the task was to be performed individually or in groups of two, in the home bases or across the net in one half of the court, etc.). Finally, many times the task description included a statement that contained a criterion to be met or an element of accountability that was formal or informal in nature. A task description contained all three components or some variation of them depending on an variety of contextual factors, including whether a task was
familiar or unfamiliar to the students, was an informing task, a review task, the
first, second, or third task in a sequence of tasks characterized by the same
organizational structure or arrangement and so on.

For example, a task may have contained information about the goal or the
end product of the task only. For instance, she may have said, "You need to work
on your bumps; do your bumps." In this case there was neither environmental
information nor a criterion or accountability measure included in the task
description, yet the students started immediately to do their bumps since they
had already been working in partners in their home base positions (Field Notes,
Lesson #2). Other times the task included one or two critical elements of the skill
addressed through the task. For instance, the teacher refined the task of serve
during a game condition by stating "hold the ball lower and avoid hitting it
hard." Other times the task contained only organizational information. For
instance, the teacher stopped a game-like task and asked her pupils to rotate their
back and front positions. And yet other times the task contained all three
components of the task. For example, the teacher asked the students "to get in
groups of two to bump a tossed ball to the partner and earn a point each time the
bump returned to the tosser; switch every five tosses" (Field Notes, Lesson #1).

Anna frequently included in her task description a statement that
contained a criterion to be met or an element of accountability that was informal
in nature. For example, the tasks included frequently a statement that asked the
students to consider the number of successful responses. The teacher stated
"every three times that you hit the target, take a step back," or "every three time
you catch the ball move a step farther from the net," or "every three consecutive
bumps, catch the ball" and so on. Such a criterion was considered for outlining
the operation of the task and was part of the informal accountability system of
the teacher. I asked Anna about why she used the number three so frequently as a criterion for the students. She explained that:

I guess I am using the number three because they have three hits on each side [of the net when playing the game] so I am just trying to carry that number over into the game. And I do think that if they can hit the ball back to the partner three times, they do have at least control enough to hit it back and forth three times. (Post Lesson Interview, Lesson #2)

Additionally, the teacher asked the students frequently to consider the number of successful responses which were to be recorded by the captain of the team in a card and be reported back to the teacher who would consider it for the end of the unit team award (see section on the class structure). I asked Anna if asking the students to count had any effect on the students' performance. She believed that her point system had a managerial and learning effect since it helped students to be more focused on the lesson and control their bumps better. In her words:

I think the cards [scoring cards students use to record the scores] helped them to keep in control better in this class (fifth grade). Because the first time (the previous lesson) they were out of control. But they had to focus in this time and keep that ball in their space to get the team point. And I think that helped them. I think that kept them under control better... they had to control the bump to get the points for the cooperation game. (Post Lesson Interview, Lesson #2)

When describing the tasks to the students, the teacher included explanations to help the students understand what was involved in a skill or the game. The explanations were delivered in an interactive form (i.e., through questioning) or in a straightforward affirmative manner. The teacher used three different ways of explaining content to the students. The first involved an "in order to" condition; for example, she asked a student "what do you have to do to get under the ball?" The second type of explanation contained or implied the condition "because of." For example, she would ask "Why do you think the ball
went straight up?" The third way was when the teacher used an example, metaphor, or analogy to illustrate an action. For example, in describing the action of the forearms during the bump the teacher said:

The forearms are like a basketball back[board]. We are not going to be moving [swinging our arms]. It is going to be very still because you want the ball to rebound off them. You just want to use them as you use the backboard to rebound the shot. (Field Notes, Lesson #1)

For the purposes of content and/or task presentation, Anna had a poster consisting of large sheets that one could easily read when standing few feet in front of it. Each sheet depicted the critical elements of the skill she taught and the doubles game rules. When she presented the various skills, Anna displayed the corresponding to the skill or rules sheet she presented. I had asked Anna early on in the unit about the poster and how she used it in her teaching. She explained that "...when we play a game, if there is a question [during the game] they can look at the rules first before they ask me. So if there is a question they can refer to that [poster]. They learn how to be more self directed" (Post Lesson Interview, Lesson #1).

In summary, when communicating the tasks to the students, Anna chose to interact with the students asking them questions and eliciting responses. She also presented the tasks in a direct way. Her task presentations were verbal and visual. She used descriptions, explanations, and demonstrations to convey the tasks to the students. The tasks included information regarding the goal and conditions of practice, including phrases or statements that addressed accountability. Finally, in presenting content, she used a poster as an aid and a resource for her students. When she presented the content, Anna asked and had the students' attention. The gymnasium did not seem to exert any constraint on her in terms of choosing and/or structuring the tasks.
Demonstrations

Anna demonstrated many times throughout the unit in both classes. She used a variety of demonstrations including teacher demonstrations only, teacher and student demonstrations, and student demonstrations only. She explained that she uses demonstrations often:

because students learn in a lot of ways. Some students are auditory [and] some are visual learners. By showing, I answer a lot of questions that students might have. I have a hearing impaired student in that class too, but I have always demonstrated because a lot of students learn when they see as well as when they hear. (Post Lesson Interview, Lesson #3)

She used teacher demonstration only when presenting a skill for the first time or when she refined, extended, or applied a task while the students were working on individual or partner arrangement in general space. Some of these demonstrations were partial and others complete. Anna’s demonstrations were brief. At times she offered a counter demonstrations to show the students the result of a correct and incorrect response. I asked about a moment she demonstrated the skill of serving in the wrong way and then went on to ask some questions in order to have her students think about why their serves tended to go up in the air as opposed to up and forward. She said:

I saw a lot of balls were going high up in air. I wanted them to see what they were doing wrong. Because you want to have students help other students, you sort of have to teach them what to look at. You can’t really say ‘go help the student’ that demonstration gives them things to look for. (Post Lesson Interview, Lesson #3)

She used student and teacher demonstration when the task involved partner work in general space. The skill Anna demonstrated with a student more frequently was the bump. The focus of such demonstration was either on the goal of the task, a critical element, or the embedded in the task organizational procedure to be followed (i.e., bump three times and catch; if the bump is not
good, catch and start again). The teacher-student demonstrations were brief and to the point. Most of the time these demonstrations were repeated twice. I asked Anna about how she chose the students for participating in a demonstration. She said that "I just choose someone that can demonstrate appropriately and try to get girls sometime and boys sometimes. I am trying to be impartial that way" (Post Lesson Interview, Lesson #4).

Finally, Anna used student demonstration only when presenting a game-like task. The student demonstrations were longer for two reasons. First, the tasks involved more components which had to be covered (i.e., goal of the task, skill(s) involved the organizational procedures, and sometimes the rules of the game). Secondly, achieving a complete and accurate demonstration of the task of this nature was sometimes a challenge in that a demonstration did not always and precisely match the goal of the task or the organizational procedure. However, even when the student demonstration was not in place, the teacher capitalized on the inaccurate performance by providing feedback to the class and/or to the demonstrators. These moments constituted unplanned learning moments. The longest demonstrations were those that involved the presentation of the game rules.

The Metaphors

When presenting content to the students, Anna used several metaphorical cues or phrases to describe or explain a skill or some component of the game of volleyball. Among the various metaphorical phrases or examples Anna used were the word "window" to describe the position of the hands when setting the ball. When she attempted to describe the way the pupils had to join their hands for the skill of bump, she said "put your hands together like you put paper around a rock." When the students had to join their hands to perform the skill of
bump, in order to describe how they had to put their thumbs side by side, Anna said that "they [thumbs] are like bodies." To communicate how the forearms need to function when bumping the ball Anna, when presenting the bump for first time, said "the forearms are like the basketball backboard. They are rebound surfaces. They don't move" (Field Notes, Lesson #1). During the next lesson, in order to review the bump and emphasize that the forearms should not swing when contacting the ball, she said "they [forearms] are like a rebound surface, just like the backboard, the floor, or the wall" (Field Notes, Lesson #2). In describing the function or role of the nonserving arm while preparing to perform an underhand serve, in order to stress that the nonserving hand that held the ball had to be steady, Anna said "the nonserving hand should stay steady "like the batting T." When assisting a pupil to set the ball in order to tell her how to use her fingers appropriately, Anna said "cup your fingers like when dribbling a ball in basketball" and "cup your hands a bit more like making a basket."

Anna used similar examples to describe not only technical aspects of performing a skill but also the rules or play aspects of the game. For example, when instructing the rules of the volleyball game, Anna drew parallels between volleyball and other sports. In describing what happens if the ball hits the line when playing volleyball, Anna said "[if the ball lands on] the line is good [in]; it is like in soccer; it is good." To teach her students about the side out rule she used an example from baseball. The following excerpt depicts how Anna explained the side out rule when instructing her student about the doubles game:

...think like in baseball: When you play baseball, can you score runs if you are out in the field? No, you have to get the other team out before you can score any points. You have to get up and bat. With serving is like getting up to bat. The only difference is that in volleyball you only have to get the serving team out once, not three times. (Field Notes, Lesson #3)
Anna had several reactions regarding the use of such examples or metaphors during her teaching. In a post lesson interview, in explaining why she used soccer to illustrate a rule of volleyball she said "I chose it because we have done soccer and the students know the rules" (Post Lesson Interview, Lesson #4). When I asked her about the word "window" and what she achieves by using it, she said:

Hopefully they will their hands above their head, in the right position. I always say look through the window. They are not going to look through that window; I mean it is very hard for them to do that. But it is going to get them focusing on the ball and position their hands between the ball and their head. I hope they will be watching the ball too. (Post Lesson, Interview #1)

I asked Anna about why she said that the thumbs are "like bodies." Because she had used the same metaphor in both classes, I commented that probably she used it intentionally. She explained:

I got that [thumbs are like bodies] from one of the student teachers. The kids learn to keep their thumbs side by side because they are bodies instead of crossing their thumbs, and so I picked that up from her. And the kids really like it. And you know, I used to say "if they are bodies they will be sitting side by side." Now I say only they are like bodies. It is a way for them to remember to keep those thumbs together instead of keeping them crossed or tucked in or whatever. (Post Lesson, Interview Lesson #2)

To the question as to whether this metaphorical expression -thumbs are bodies- has been an effective cue for the students, she responded:

it has been; she [the student teacher] used it great. So I’ve been using it ever since she used it. ... and if you saw them, most of the kids did have their thumbs together. If I say, "do not forget, they are bodies" something to help them [students] remember rather than saying make sure your thumbs are straight together, pointing, you know what I mean. It's like quick words you can say for something you can say. (Post Lesson, Interview Lesson #2)
In the final interview with Anna, I asked her again about the use and function of the various expressions she used throughout the unit. Discussing the reasoning behind the use of these metaphors, Anna indicated that she mainly used them in order to help students connect the new knowledge with previous knowledge. She stated:

Some of them [expressions] I use intentionally because I've used it before like the 'window'. Some of the other things like the batting T I didn't think to use that until this year because a lot of the kids were throwing the ball with their holding hand and since we've done striking and the batting T's and we talked about in previous years, I thought, well, maybe that might be helpful. I don't know why I started using them. It just happened. But it's to help them have a connection between what they know to what they're trying to do and try to make some connection. 'Oh, OK, my hands, it's not supposed to move them'. You know, sometimes if you just say don't move your hand, that doesn't quite get it. So if you say 'think of it as a batting T and you've got to hold that really still' then it's like 'oh, okay, yeah'. (Post Unit Interview, p. 15)

Class Structure

Anna structured her class using a version of the sport education model. She assigned four captains for the unit of volleyball whose initial tasks were to a) divide the class into two groups and b) assign each student of each of the two large groups in particular numbered home-base positions listed in a sheet of paper provided to the students by the teacher. The home-base numbers corresponded to a number printed on the floor of the gymnasium. Two of the four captains were to be captains of one large group and the other two on the other; however, the captains did not know the groups they were going to be assigned. This was done in order to secure impartiality in dividing the members of the entire class in two groups in terms of, a) skill level and b) personal affiliations. The following excerpt depicts how Anna described the class structure:
... The captains divided the group into two teams. I appoint the captains after I see the teams. The captains first choose the teams but they do not know of which team they will be captains which helps them be more fair in dividing the class into the two teams and their friend are not necessarily in their teams. They sort of get equal teams.... On the sheet, when I appointed them it has the base numbers. When they came in the class they have the students' names and their home bases but they do not know on which team they are captains. (Post Lesson Interview, Lesson #1)

During the first lesson of the unit, one group was placed on one half of the gymnasium and the second group in the other to facilitate both the general class organization as well as subsequent groupings of pupils without mixing students from the two larger groups. The teacher did not interfere with the captains' tasks unless there was an obvious imbalance between the large groups. There was no such interference in the volleyball unit.

There was a point system the teacher had established in her class for the purposes of student accountability. I asked Anna about the point system. She said:

At the end of the unit they will earn a team award for the team that will earn the most points. The team points can be earned for anything I want... I can say that I am going to give you a team point for such and such, or I will give you a team point for this and this... [For this unit] I give them a team point if all their team has their tennis shoes, if all their team warms up, and if their captains reported attendance and tennis shoes. I am trying to get their captains to know their team members. (Post Lesson Interview, Lesson #1)

The students during the classes were challenged to score points for their success in the game oriented tasks, as well as for their appropriate managerial behaviors. I asked Anna how the members of the teams earned a point during their participation in the game oriented tasks in the lessons of this volleyball unit. She said:

They are working for their team award at the end. I do not just want to give them points for winning the game, although I do give a point for that. You get a point for playing, for refereeing, and winning. If you tie, both
teams get a point. I give the points because some teams cooperate well
together. They may not win the game but so far as team work they do a
good job. (Post Lesson Interview, Lesson #4)

Anna indicated that "The point system gives the kids responsibility and it gives
the captains the chance to be good leaders. That is what they have to do when
they get to real life" (Post Lesson Interview, Lesson #4). In an earlier discussion
we had, she had indicated that the point may help students perform the tasks
better (Field Notes, Lesson #6).

**Grouping of Students**

The grouping process was such that was primarily decided by the
students themselves when directed by the teacher or was left to randomness
created by situational rotations. When students were asked to work with a
partner in a task during the lessons, the students chose their own partner. The
teacher did not make any effort to put two students to work together in any
systematic manner. During the lesson, however, the teacher switched partners
regularly, especially in the early part of the unit. She accomplished this by either
asking students to find another partner to work/practice with or by rotating only
one row of the home base positions so that the pupils found themselves
practicing with another student that they had not chose (Field Notes, Lesson 2).
Both techniques worked very well since the students willingly changed positions
and continued to practice the tasks without any observed discomfort. In
explaining why she frequently directed the students to work with another
partner, Anna gave two reasons: a) to give all the students an opportunity to
work with one another in each of the two teams in the class and to get to know a
little about each other, and b) to be fair to all students in that she did not want to
have one only student work with a low skilled student to avoid possible
frustration. She said:
I wanted them to play with every team member before they finish the unit so they played with every person and also sometimes you have some partners that are really low skilled and it is very frustrating for a partner to stay with that partner the whole time... plus I think it is good that you are learning to play because eventually you will be in the same team, if we ever make it to three on three, which it looks that we may not, but if we do, they can end up playing with one of those three people. So it is like you know if you had a team you want your team members to know about every person on the team. (Post Lesson Interview, Lesson #1)

In Anna's class, it was the captains' responsibility to place two students together for the doubles game. The only criterion she asked the captains to consider was equal skill level. Once the doubles teams were decided, the teacher did not ask the students to change teams unless there was a reason. As she explained:

... For the doubles teams the captains made up the teams. I have the captains choose the teams; I let them choose the teams; I do not care if it is a boy with a boy, girl with girl, mixed or whatever. What I might tell them is that I want mixed skill level, that I want a beginning and an advanced player. Once they choose their teams, I usually do not change them unless I foresee a problem. (Post Lesson Interview, Lesson #3)

Additionally, if a student was absent and/or one did not have a partner to work with, it was the captains' responsibility to place the single student in another group so that there would be a triad working together on the assigned task(s) for the day.

There was one modification to Anna's approach to organizing the pupils in the class. Daily the teacher had a different student work in tasks requiring a partner with a multihandicaped student in the fourth grade. The teacher explained that working with a special student can be a valuable learning experience for all parties involved. In her words:

... and also for the multihandicaped student. I try to rotate him too so all students will work with him and I think my fourth grade does a great job.
working with this [multihandicaped] student. And I think that is good
because when you work with somebody you learn. It is not just one way.
I think you understand better if you have to help someone. (Post Lesson
Interview, Lesson #1)

In summary, although the teacher prompted the students to change
partners frequently, she allowed her students to choose their own partner. The
teacher did not assign different students in different groups to meet a skill
learning objective. The teacher accommodated a multihandicaped student by
assigning a new student or a group of two students every day to work within the
various assigned tasks.

Equipment and Environmental Arrangements

Throughout the unit in both classes, Anna did not use regulation
volleyball balls. Instead she used training volleyball balls. She explained that
"they [training balls] are larger and not as hard and small as the leather
[regulation] balls. The kids can play with them for all day long without getting
browsed" (Post Lesson Interview, Lesson #1). She used the same training
volleyball balls in all tasks and for all the students in both classes with two
exceptions. First, when she introduced the set to the fourth graders during the
second lesson, she used the beach balls for the first three tasks; then she asked the
students to use the training balls. The second exception was with regard a
multihandicaped student who was given a beach ball instead of a training ball to
practice the individual and partner tasks. However, when the tasks involved
game-like conditions (i.e., two on two game-play), the beach ball was not
utilized. In this case, however, the teacher made an adjustment to the way this
student could earn a point for his team. For example, during the two on two
serving game, while the receiver of a serve earned a point only if he/she was able
to catch the ball in the air, the special student could earn a point even if the ball
had bounce once and was caught afterward (Filed Notes, Lesson #3). Anna, additionally, instructed the student(s) that the special student was working with to use a beach ball when it was the special student’s turn to bump, or serve.

Anna did made certain environmental adjustments during the unit to facilitate student learning. For example she had place on the wall targets at a certain height so that the students had spot to aim at the wall when practicing their serves. Additionally, she had lowered the nets to facilitate the students’ game play. She emphasized that the environmental conditions during practice time needed to be appropriate for the developmental level of the students. She expressed some concerns she had about the height of the net during the volleyball unit in relation to appropriate practice conditions and safety issues. In the following interview extract she expressed her views and concerns about this issue:

"So we need to bring it [net] down on their level. Third grade I bring it down to one of the even lower levels. But for 5th graders, I do want it high enough that it’s over their heads so I have to take it up that extra notch. I wish there was one right in the middle. ... It is lower than 7 feet. And then it sort of dropped in the center. I didn’t tie the ends. Just mainly for safety, because, even though they’re not supposed to go under the net, they still run under the net, and that way they wouldn’t get stuck. They still could have gotten stuck but at least they wouldn’t strangle themselves or whatever. And they weren’t to the point that we were playing the ball out of the net yet but that would have a big impact on their game play so I wasn’t too concerned about that. ... In the third grade it’s down to the lower, when we do our bumps and even when we do the serves. When we play the different games, it’s lower. (Post Unit Interview, pp. 21-22)

In summary, during the volleyball unit, Anna used balls she considered appropriate for the students. She chose to use training balls for the most part in her unit while she used beach balls briefly in a class and for individual needs in one occasion. She also made certain environmental arrangements regarding the
targets on the wall and the height of the net to facilitate student practice and success in the tasks.

**Teacher Interactions**

Anna supervised her students actively. She monitored the students' performance carefully, moved briskly, and interacted with her students throughout their involvement in their tasks. The nature of the interaction was verbal, visual, and manual. The content of the interaction was related to the subject matter most of the times. When interacting with her students verbally, Anna was more likely to initiate an exchange by asking a question. There were also times that the teacher offered feedback to a student by stating the observation she had. No matter whether the approach was direct or indirect in nature, Anna almost always addressed the students with their first names.

When initiating an interaction in the form of a question, there were two developments. First, the interactive episode consisted of the question only. For example, the teacher asked "What do you need to do, Mike, to send the ball up in the air?" or "How do you have to receive the serve, Nick?" (Field Notes, Lesson #3). Secondly, the interactive episode consisted of a brief exchange between the teacher and the student(s) involved. For example, a student had to roll the ball to another student during a task. The following exchange took place:

Teacher: Stephanie, how do we return the ball?
Student: Roll it.
Teacher: Roll it or take it back to the space. (Field Notes, Lesson #3)

When the students were working in groups of two, the teacher's question could be directed to either the performer or the partner whose task was to watch the partner's performance and offer feedback. Anna tended to ask the question to the partner who was watching the partner who was performing the task but the question could be heard by both. For example, the students were paired and
were working with a partner on "the serve against the wall" task. The teacher
was supervising the student performance. Upon watching a student to perform
a serve, the teacher interacted with the partner who did not serve. The following
dialogue took place:

   Teacher: So Joy, what are you going to tell Kelly?
   Student: I am going to tell her that she used the wrong foot.
   Teacher: Excellent [to Joy]! You need to step with the other foot [to Kelly].

Another time the following interaction took place:

   Teacher: Christina, did she step with the opposite foot or it was the same?
   Student: It was the same
   Teacher: Next time watch that she steps with opposite foot from the
           hitting arm. (Field Notes Lesson # 3)

Another mode of interaction was that the teacher addressed a student's
performance by simply stating what the teacher observed or what the student
had to do to enhance her performance. For example, the teacher stated "Sofia,
look at the ball. Look at the ball, lean back, and then step." The teacher observed
the response of the student after the feedback statement and responded to the
student's subsequent response by stating "OK [enthusiastically]! Better just hold
the ball a little bit lower". (Field Notes, Lesson #2)

   I asked Anna about her approach to interacting with their students
through questioning. In particular, I asked her if there was difference between
saying to the students directly "bend your knees" or "follow through" and asking
them "Why did the serve go on the net, Jenny? or "Where do you have to follow
through, John?" and so on. The teacher responded by saying that "I think they
may be able to analyze what they are doing better. That is what more important
to be able analyze what you are doing" (Post Lesson Interview, Lesson #2).

   The content of the interactions contained most of the times critical
elements of a skill or a component of the game, including the rules. Most of the
times the critical elements had already been presented during the initial content presentation or some subsequent task presentation. To address the bump, for example, she used the following critical elements:

- Used to receive a serve or a ball below waist
- Arms straighten parallel to floor
- Hands together
- Ball rebounds from forearms
- Knees bend, then straighten

For the serve, the following critical elements were used to describe the skill:

- Swing through the ball
- Follow through toward the target
- Take a step forward use the legs to bend and stretch
- Keep the nonserving arm steady like the batting T is going to stay steady
- Watch the ball.
- Start in Stride position with opposite in front
- Hold ball with palm underneath (not-striking hand)
- Partial fist
- Underhand swing of striking hand
- Watch the ball as the hand hits it and follow through toward the target
- Knees flex and extent as weight shifted forward

(Filed Notes, Lesson #5)

Anna used the cues during the interactive process in different ways. For example, she stated the cue in its simple (e.g., follow through to the target, use the finger pads, etc.) Another way that she used frequently was to include an underlying purpose in the phrase. For example, she said, "Keep your arms straight, do not swing them because you are loosing control," "Use the legs to bend down and lift up," or "Bend your knees to get more power," "Use your feet to get under the ball," and so on. A third way was to match two opposite statements with the same meaning to address the same point. For example, she said "The ball should clear the top of net, it should not touch the net." A fourth way was to match the function of two different critical elements in order to stress
their different function. For example, she said, "Move your feet, not the hands in
order to get under the ball" (Field Notes).

Anna used a wide variety of cues to describe the skills. It seemed that
most of the feedback statements addressed particular skill elements more
frequently than others. For example, when the students practiced the bump,
most of the feedback statements focused either on the use of legs and the use of
the forearms, especially the swing of the forearm arms. For the serve, most of the
feedback statements focused on the holding the ball, contacting the ball, and
follow through to the target. I asked Anna about what she looks at a student's
performance in giving them feedback. She responded "... I try to pick up one
thing that if they will do it, it will change what they are doing. I am trying not to
be too picky because some times you get to be picky on little things." (Post
Lesson Interview, Lesson #4)

It seemed that the teacher knew her students' skill level. This knowledge
was incorporated into the design of the tasks to facilitate the students' various
level of performance. This flexibility that some tasks allowed created a zone of
comfort for some students. For example, in the serving across the net game-like
conditions, she allowed her students to serve the ball from about 15 feet distance
from the net - the green line. The students were given the option to serve from
any distance behind this line up to the back court line. Once during a game, a
student, took an extra step toward the net to attempt to serve the ball. Anna
noticed it, but did not say anything to the student. Later she explained that:

Vicki, the new student we have this year, she still can't serve from behind
the green line [about 15 feet away from the net]; she sort of was taking a
step closer to the net. The other team did not say anything, so I did not
say anything, because that is what she felt comfortable trying to serve
from. (Post Lesson Interview, Lesson #5)
In summary, in all her interactions throughout the lessons in both classes, Anna interacted positively creating a cooperative and academic environment. Her students engaged willingly in the assigned tasks, and assisted and supported each other's efforts to learn the content. They also seemed to improve their skills and function as independent learners during the teaching learning process.

Summary

Anna used verbal and visual techniques to communicate the content to her students. When describing the tasks to her students, the teacher used a few critical elements to address the major components of the skills and asked several questions. The verbal description of the skills was accompanied by demonstrations that involved the teacher, the teacher and a student, or only students. During student practice, Anna supervised actively her students and provided them frequently with content related feedback as well as individual demonstrations when needed. The interactions were positive, content related, and contributed to a positive and task oriented classroom atmosphere.

RQ. 2. What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

Anna's Background and Knowledge in Volleyball

Anna has no coaching experience in volleyball. However, she coached gymnastics, track and field, and swimming. She said that at times she watch volleyball games for entertainment and educational purposes. She said, "I've been at games at O...... and, of course, the Olympics are real big. I always watch it. ... I watch it because it's fun and... see what they're doing" (Pre-Unit
Her participatory experiences in the game of volleyball is limited:

I played one season in recreational league with teachers. .... We just played one season and so that's all the recreational experience I have with volleyball. (Pre-Unit Interview, p. 5)

She indicated that volleyball was one of the sports that she was less skillful. Also her knowledge about strategies of the game was limited. She noted:

So far as my ability, this [volleyball] and I would say lacrosse or stick ball are probably the two sports that I'm least skillful in and besides stickball this is probably the one that I really don't know as much as I should about strategies, etc., but I'm learning all the time. It's okay. I've made a lot of modifications. I think my students learn but if I had to choose the sports that I felt the less competent in it would be volleyball and lacrosse. That seems strange. (Pre-Unit Interview, p. 4)

Anna noted that her teaching experience in the game of volleyball was quite extensive since she taught it more than 10 times. According to Anna, her knowledge about the game of volleyball was not advanced but she felt that she had enough knowledge for teaching volleyball at the elementary level. As she put it:

I think I know it well enough to teach it to my students here because of their knowledge level. If I were to be teaching in high school though, if I had some really, really skilled students, then I would feel that I would really need to have someone else come in, someone who knows about the game give me some points on other things we should be doing but so far as the basic game I think I'm OK. (Pre-Unit Interview, p. 8)

Reasons for Teaching Volleyball

According to Anna, volleyball is an important sport in the school curriculum. As she said, "I think this [volleyball] is a very worthwhile sport..." (Pre-Unit Interview, p. 4). Two of the reasons she offered for including volleyball in her course of study were, a) its recreational value and b) the opportunity her students would have to receive formal instruction about the game in order to be
able to play in their recreational time in various settings or occasions. She commented:

I do volleyball because I think it's a great recreational sport. I think that the kids will say 'we played volleyball in the summer time at my potluck or whatever. So that's one reason I do it because that is a sport that they can do with family later and this sometimes is the only place where they get instruction on the proper skill technique and things like that. ... At least when they go out they know how to keep score and what some of the rules are. (Post Unit Interview, p. 14)

Despite its recreational value, volleyball, Anna noticed, was not very popular sport in the community, especially among the youth. She described:

I have a feel that it's a recreational sport because a lot of kids will say we played volleyball at my picnic or things like that. I don't see it, although we do have recreational leagues where people come and play volleyball. Mostly adults. I don't see a youth recreational league for volleyball right now. ... I think it's just more a recreational sport that they play in the summer time with family and friends. (Pre-Unit Interview, p. 13)

Comparing volleyball with other sports such as soccer and softball, Anna pointed out that there were no leagues for volleyball in the community. Anna believed that volleyball is a difficult content to teach because students do not have a lot of practice and experiences with the sport:

I think #1 students just don't have a lot of practice and #2 it [volleyball] is not an activity like soccer; we have soccer leagues, softball leagues, all those kinds of leagues but we don't have volleyball leagues and the striking activity is a very hard concept for them to get. ... In softball they practice some place else; swimming too. But in volleyball, there's nothing unless it's a recreational summer program which I don't even thing the D... parks have recreational offer a children's volleyball league. (Pre-Unit Interview, pp. 16-17)

Although Anna enjoyed teaching volleyball to her students, she pointed out that at times she faced some concerns with the students' volleyball skill level. She emphasized that, at times, it was frustrating teaching it because it was difficult for her students to acquire the skills. According to her, the students were more
able to play basketball or floor hockey even though they might not have advanced skills. Anna indicated:

I do enjoy teaching it [volleyball]. I think also it's a very frustrating sport sometimes to teach because it's hard for the students to obtain the skills and it's not like basketball where they could play even if they don't have a high skill. Sometimes in volleyball it's really hard to get that ball over the net if you don't have the skill and so it's a serving game only sometimes. ... Like I said there has to be a certain skill level there for them to even get the ball over the net and whereas if you were doing floor hockey or something just hitting the puck, most kids can at least get the stick and hit the puck so they at least feel in the game. But in volleyball, if that ball doesn't go over the net, they may not feel successful so the whole game stops. ... But besides that, yes, I do enjoy teaching it. (Pre-Unit Interview, p. 6)

Another reason that Anna provided why she considered volleyball as a difficult sport to teach is the possibility of using inappropriate progression or methodology while teaching the skills to the students. She stated:

I don't know why it's so hard to teach. Maybe we're missing something. Maybe there is some step we're missing. I don't know. I don't know developmentally if that's right I don't know. In gymnastics you're able to break down everything. Even the front roll you can break it down to very, very small things but, when you're striking, that striking activity they have to hit the ball so it has to hit on the forearms or some place in order for them to actually hit it and maybe that's it. Maybe they need more experience moving to the ball. I don't know. But I think it is a very difficult sport to teach. (Pre-Unit Interview, p. 16)

Comparing the delivery of content in the unit of volleyball with other units of instruction (i.e., soccer, floor hockey, or gymnastics), Anna stated that the nature of the content led her to use different approaches to teaching. She emphasized:

In volleyball I think I spend a lot more time at the beginning trying to make sure that they have the skills so they're more successful in the game, whereas in soccer we have a one on one tournament the second lesson after we do our dribbling, because the first day is getting everything organized and we do our dribbling and we play a control ball game where
they have to try to keep control of the ball and someone else tries to take it away and so then the next lesson we just do some shooting real fast and then we are ready for a one on one game. So I move into the game situation a lot faster but I think that's because of the students. As I said [in soccer] before a lot of students that may not be great shooters but, even if they touch the ball with their foot, they can be successful. Whereas in volleyball it's harder to make contact with that ball and be successful. So I think I do a lot more of cooperation and those types of things in volleyball than I do like in my floor hockey or my soccer. We do one on one and then we introduce passing and then we have a doubles game right away. (Post Unit Interview, p. 13)

According to Anna the nature of the sport affected to a major degree the way she set up her classes and the drills that she selected for the students. She went on to explained:

... A big part of it too it's the nature of the sport itself. It brings out different things. [For example] I run completely different gymnastics. So I think the sport itself. What drills I use and how I set up the class and all those things vary with the sports. (Post Unit Interview, p. 13)

Anna believed that volleyball is more demanding sport than other sports. Students are less successful performing the skills and coaching each other in volleyball than in soccer. She noted:

For me it's more demanding because I want the students to be successful and it's really hard for them to get that bump and that serve and be successful. And it's also harder for them to coach each other, whereas in soccer, a lot of the kids play soccer and they can really help their teams more. They play in an organized league. ... So there's not that much knowledge besides the backyard game for volleyball. (Post Unit Interview, p. 13)

Anna pointed out that the set was a difficult skill to be learned by the students. She indicated that the bump and the underhand serve were easier to be acquired by the students and be applied in game situations. She said:

I think that using modifications a lot of the skills are easier to teach. I think that students learn to serve, the underhand serve because they've had underhand skills before and I think that is sort of a carry over. The bump is hard but, once they get it, it's easier for some reason than the set.
I'm not sure why but the set for some reason it's so hard for them to do a legal set. They want to hit it with their hands instead of using their fingertips. So I think once they get the bump and the serve, then they can play a game even if they don't have the set. ... If you're just looking at two skills that doesn't seem very hard to teach. (Pre-Unit Interview, p. 6).

In a short unit of volleyball Anna taught her students only the underhand serve and bump. She believed that the students learned these two skills they could play a whole game of volleyball. She also believed that the bump was more appropriate skill to be learned in the early lessons since it could be used throughout the game. Students could use the bump either when the ball was high or low. She stated:

I emphasize the serve and the bump. And then I do introduce the set but I'll emphasize especially in the short unit just the serve and the bump. ... Because they could use the bump if a ball is high, they can wait for it to come low they can hit it. They can use the bump to the low ball so they can use the bump almost throughout the whole game. And once they have their hands in that position, it's hard for them sometimes to get them up to the set and get back to the bump. So for elementary kids, serving and the bump they could play a whole game with just those skills really. Then when we add the set later that's one more variation that they can use, but especially in the short unit, that's just what I'll emphasize. (Pre-Unit Interview, p. 7)

Anna pointed out that she would first teach the serve and the bump and then the set because she wanted to provide students the opportunity to experience some success. She also said that it would be difficult for the referees to discriminate between a legal and an illegal set during the games and, as a result, the students would not be able to get feedback about their performance before they move to a more difficult skill. She explained:

I think #1 I want to let them have success in what they’re doing and the serve and the bump, if that's going to give them more success, then that's what I'm going to emphasize right now. Like I said, I will introduce the set and some students will use the set, but with student referees they also are not able to call illegal sets or legal sets so it's really difficult --- they're not getting the feedback if they're doing something wrong all the time in
their set. The bumps are much easier for them to see too because, if the two hands aren't together, they can call it. So, I think, from that aspect - you want them to have success and, #2, you want them to have feedback, the bump is probably the easiest one for them to get that. (Pre-Unit Interview, p. 7).

Anna indicated that she did not teach the spike and block since they were not in the course of study. "We don't cover the spike and the block. That's not in our curriculum for one thing. What we're supposed to cover in our curriculum study is the serve, the set and the bump and so I'll do that but we don't cover the block or the spike" (Pre-Unit Interview, p. 8). Discussing the possibility of having the freedom to teach any skills that she wanted, she pointed out that the level of the students would affect the selection of skills like the spike and the block. She went on to indicate that during the intramurals sessions, the advanced students might use more advanced types of skills. She noted:

It depends on what level my students were at. It really depends. In five lessons though, I don't know that we'll get to that level [instruction of spike or block]. ... We'll also be doing intramurals at lunch time so then we have an advance, intermediate and beginning levels so depending on the skill level we can vary the rules as we see fit in those games. I talked about the underhand serve but we may have some students that are doing the overhead serve too. If they get the underhand well, then they can go on to the overhead. So if they can do the overhead serve, then they might go onto the spike, depending on what level they sign up for. (Pre-Unit Interview, p. 8)

Goals in the Volleyball Unit

During the instructional unit of volleyball, Anna expected her students to practice their skills, to develop some cooperative behaviors, to see the captains of the teams demonstrating some leadership roles, and be able to improve their volleyball play skills. She stated:

I'd like to see students be on task in practicing. I want them to also be able to help each other. I think that's really big, especially since we have multi-handicapped student in this class. Since we're doing the sport education,
I'd like to see the captains take some leadership roles and, of course, I'd like to see them end up playing volleyball a little bit better than before they came into the class. (Pre-Unit Interview, p. 12)

Responding to the question if she had different expectations for the volleyball unit than the expectations she had for her students in other units, Anna stated:

I probably won't see the skill development in this unit that I would see in a longer unit but, so far as their behavior and their practice, it would be the same. (Pre-Unit Interview, p. 12)

Anna stated that in the mini unit of volleyball she intended to teach "the serve, the bump and then the set and refereeing; officiating (Pre-Unit Interview, p. 9). In the following interview extract, she described how she planned to progress the unit:

We'll start with the serve and the bump and we'll go to cooperative game with a partner. Then we'll go to a competitive game, doubles game and then we'll go to threes. Cooperative and then competitive and that's really all in this unit. That's really fast for five lessons. We may not get that done, depending on the students. .... And we'll reinforce the games we play in gym in intramurals at lunch time for any students that want to sign up so they'll have two opportunities, not just gym class. So hopefully they'll sign up so they can get more practice. (Pre-Unit Interview, p. 9)

She pointed out that as the students would practice their skills she would introduced some simple strategies from the game of volleyball. She indicated:

Hopefully a little bit of strategy. Like when someone serves, the person in the back takes it with a bump, sends it up to the front person so hopefully they'll be some simple strategies in the game rather than just to hit back and forth game. ... As they're playing, we'll start to do some of the strategies. Like I might say 'now, this time when you're playing your doubles game I want one person to serve and I want the back person to take it with a bump up to the front person'. So as they're playing, we'll start to introduce some simple strategies. (Pre-Unit Interview, pp. 9-10)

Discussing the question if she would ask her students to place the ball to an open space during the game situations, Anna noted:
When they're playing another person, then they can pass it to the open space, yes. But for their cooperative game, it will just be between the team members but then the competitive game will be on the other side of the net. Then they can do that. (Pre-Unit Interview, p.10)

Anna pointed out that during the volleyball unit she intended to have a tournament. She explained:

When we have our competitive game it will be a tournament game. First they'll practice it with their team and then they'll play it against the other team so it will be a mini-quick tournament. ... Today we'll start the introduction and we'll introduce the skills and next time they'll do their cooperative game and we'll introduce —if time goes well, after they've done their doubles cooperative, then we'll introduce the doubles competitive so they'll practice it then and then hopefully the next lesson they'll do [a mini tournament]. (Pre-Unit Interview, p. 10)

According to Anna the students in the fifth grade class were more skilled in volleyball than the fourth grade students. Discussing the volleyball history of the two classes, Anna pointed out that the fourth graders have practiced lead-up volleyball activities in the third grade. The fifth graders also practiced lead-up volleyball activities in the third grade and had a long volleyball unit when they were in the fourth grade. As she noted "... the fifth graders had a longer unit last year and they were in lead-up the year before so the fifth graders should already know their serve and their bump and a little bit about the set. Hopefully they'll remember" (Pre-Unit Interview, p. 15).

Although the fifth graders had more experience with volleyball, Anna indicated that she did plan to teach the same basic skills in the two different classes. She said that "the serve and the bump -I'll still stress them in both classes and introduce the set which the fifth graders will probably use a lot more successfully than the fourth" (Pre-Unit Interview, p. 15).

Anna stated, however, that she expected the fifth graders to perform better the skills, and especially the officiating duties than the fourth graders. As
she noted "... and also in refereeing and I think that the officiating will go a lot smoother with the fifth grade than the fourth grade. A lot smoother I hope" (Pre-Unit Interview, p. 15). Discussing the reasons why Anna choose to teach the same basic skills to fifth graders even thought they were better and more advanced than the fourth graders, she stated:

Because, when we say they're more skilled, we don't mean that they can do the bump well. We just mean - like for example, I let them hit it on the bounce; so fourth graders they'll probably be hitting on the bounce more than the fifth graders but when you see the control you'll see why we really need to work on the bump more. (Pre-Unit Interview, p. 16)

Discussing her experiences with the fifth grade class, after the end of the mini volleyball unit, Anna stated that it was like starting from the beginning with the majority of the students because they did not remember a lot of things from last year. She noted:

I thought the 5th grade would remember a lot more from last year than they did. The carry over was not so great. They did get through their competitive game but it was like we had to start from the beginning again although they remembered some of the things about the bump and the serve and things, but it was like starting from the beginning with the majority of the class. (Post Unit Interview, p. 1)

Anna explained that the fifth graders' skill performance was not as good as she expected but their performance in refereeing was good. In the following interview extract she addressed the observations she made and concerns that she had for the fifth graders:

I didn't see a lot of carry over so far as skill performance from the following year. ... And they remembered how to do the bump but they were swinging their arms and, on the serve, it wasn't going where it was supposed to and they remembered some of the cues but again performance of the skill. I think the refereeing went pretty well with the 5th grade. I think they remembered a lot of the stuff from last year. ... They couldn't manage the force because they were swinging their arms instead of using it as a rebound surface and using their legs for the force. And, you know, direction. They weren't facing their target all the time
and a lot of the things that we worked on last year sort of all they remembered was keep those arms straight and hit that ball. (Post Unit Interview, pp. 1-2)

Discussing the accomplishments of the unit in the two different classes, Anna felt that the majority of the students had improve their skill level but the level of success varied, depending on the conditions of performance. She described:

... There's a difference whether you're looking at a child improving what they could do or whether they can do the skill that you want them to do. ... So I would say improving their skill I'd say at least 75%, maybe more improved their skill. Maybe even more because I'm looking at my very beginners who really couldn't even hit the ball over the net. Most of the students were able to at least serve the ball over the net. It may not have been in the court but - so maybe more than that. So far as performing the skills, I think there's maybe a bigger percentage of improvement than there was actual skill performance, excellent skill performance, so maybe 60% skill performance so far as being able to do a serve and a bump. I'm not talking about team play because that would even be lower if you wanted to count the number of teams that use team play that would be a lot lower. (Post Unit Interview, p. 5)

In the following interview extract, Anna described the differences in the students' performance between the classes. She pointed out that the fifth graders performed a more "controlled play" and had little arguments among them while refereeing their games. The fourth graders, however, were arguing over the points and the scores during the game situations. She said:

I think the 5th graders did end up having better play than the fourth graders once the games started going, and I'm looking at my extreme advanced end of both grade levels. I think my advanced team in this grade, the fifth grade, did a lot more controlled play and did do partner hitting more than the fourth grade. And like I said, the fifth grade was able to go ahead and play a lot faster with less arguments because they had already had the refereeing the year before and scoring. Whereas the fourth graders, when it came to their game, a lot of them were arguing over the points and the scores so that took away from their game play. So I do think as it has turned out the fifth graders ended up probably overall
with a little bit higher skill level than the fourth grade. (Post Unit Interview, p. 5)

During the unit of volleyball Anna indicated that she did not differentiate a lot between the 4th and 5th classes in terms of the nature of the skills. She stated:

"Except for the day that I introduced the set with the 4th grade, which I'm going to go back to my old way of doing things, but except for that day, I think that the fourth graders, if we had more time, we would have been spending more time on that drill, whereas the fifth grade they picked that up from last year quicker so they would have been able to have spent more time on team play but besides that, because we worked on control in both classes, I don't think that I did. I'm not sure. I sort of respond to what the class is doing." (Post Unit Interview, pp. 5-6)

Anna pointed out that during the volleyball unit she employed very simple game strategies. One of them was the "serve to an open space". She indicated that the students were not able to use such strategies throughout the game in such a small instructional unit. She stated:

"In the game situation I think once we started the games all they thought about was getting the ball back over the net in any way they could. But, when we had the longer unit, then I think you're able to come back to these and say 'remember when we did such and such and we tried to get the ball when you serve to the open space?' Now in doubles court, you don't have that much open space; the full length. Then you would have an open space between the two players that would be an open space. So I think during the game, since it was their first tournament game, all they wanted to do was get that ball over the net and get the point. ... I don't think that with the amount of practice they had that they were able to direct the serve all the time the way they wanted it to go. So even if they were trying to get it to the open space, if it got there, usually it was just by accident." (Post Unit Interview, p. 7)

Cooperation, or teamwork, was a major part of Anna's goals for the unit of volleyball. Discussing the degree that she was able to accomplish this goal, Anna pointed out that she emphasized teamwork in a very simple nature. She noted that she addressed "communication" during the games towards the end of the unit. In her own words:
In the game situations we talked about communication, talking to your partner. First I talked about playing your own position because what happens sometimes is you'll have a highly skilled player that seems to hold the court so we talked about playing your own position first. But then we talked about communicating with your partner. Saying 'I've got it' or 'help', if you hit it straight up in the court and then somebody needs to come back and help them; so we talked about it a lot. We worked on passing to our partner but we really only had two days. One day they had a practice game and so we really didn't get to spend a lot of time talking about teamwork except I think communication was one I tried to stress when they were playing so at least they knew what their partner was doing. (Post Unit Interview, p. 16)

Discussing the common problems that the students faced while practicing the bump and the serve, Anna pointed out:

I'd say on the bump they wanted to, of course, power the ball by swinging their arms up and down, and then, moving in position is really hard to get in the right position, facing the target and getting underneath the ball. Moving their feet. If the ball didn't come close enough to them instead of moving their feet they'd lean forward or swing sideways, whatever so I'd say those are the two. In the serve, I'd say a lot of times just hitting the ball in the right place. Sometimes they hit underneath and it would go up and then their follow-through on the courts. Most of the students were watching the ball. Most of the students were able to swing and step okay. A few still weren't using opposition and I'd have to say step with the other foot but I think that the little refining things. I think, overall, the general performance of the major things were okay. (Post Unit Interview, pp. 17-18)

Teaching another volleyball unit next year, Anna would like to spend less time on the "two player game" and she would like to try the "four player game." She described:

Like I said, the doubles court is half of a volleyball court which takes more. Even though more people get to serve, it takes a lot more control to keep that ball in that court. Now if you had the four player game, I don't know if there would be more hits per child, but I know that it would take less control to keep the ball in the court. So there might be more volleys going back and forth over the net. So it's a trade off sort of. ... Four on four in the entire court. And I might shorten the court. I don't know. I'd have to see. I'd just have to try it once and, if I needed to shorten the
court; in fact I'm going to try it in intramurals with a shortened court instead of the longer court. If it doesn't work I'll say okay, we're moving the boundary lines back now. (Post Unit Interview, p. 4)

Anna explained why she might have to shorten the courts:

Just so that the back players can cover the court better and maybe that will keep the front players up in front. When there is a big distance the front players keep wanting to move back instead of letting the back players move forward so maybe that will help. (Post Unit Interview, p. 5)

Summary

Both teachers developed the content progressively using different types of tasks, and both teachers exhibited different patterns of task progression. For example, Anna, with the exception of the first lesson, included applying tasks systematically in each of the lessons in both classes. Irene, on the other hand, used more extending and refining tasks in the first four lessons and increased the number of applying tasks in the last two lessons in both classes. Both teachers used extending and refining tasks after introducing a new skill and before using any applying tasks. The content development patterns in terms of the types of tasks employed were similar across the two classes each teacher taught. Anna progressed the content through identical learning tasks in both classes. Irene, on the other hand, sequenced and progressed the content through similar tasks in both classes for the most part, but she also differentiated the content and tasks between the two classes. Both teachers progressed the various tasks in similar or different timing indicating that Anna and Irene considered their students' responses in developing the content. Both teachers exhibited consistently a content progression pattern that related to the organizational conditions of the tasks in both of their classes. Another characteristic of the teachers' tasks representations was that both incorporated in some tasks flexible performance
structures in order to facilitate skill variability on the part of the students. Anna and Irene communicated the content to their students with clarity and precision through the use of demonstrations, and appropriate and clear task descriptions. The teachers interacted with the students frequently during their engagement in the tasks. They both provided the students with frequent and content related feedback.

Irene and Anna had different backgrounds in volleyball. Both teachers did not seem to consider themselves as experts in the game of volleyball in terms of their knowledge, but both felt that they knew the game well enough to teach it to elementary school children. Both teachers supported the presence of the volleyball in their curricula because of its lifelong recreational value. Anna and Irene wanted their students to learn the skills and rules of the game, be able to experience success when using their skills and knowledge in game-like conditions, be able to cooperate, and enjoy their participation in the game. The two teachers taught different content to their students and their instructional approaches to teaching the volleyball units had certain similarities and differences. Both teachers were remarkably consistent in terms of what they planned to do and what they did. They both felt that their students had improved their skill more than their game play capabilities.
CHAPTER 5
DISCUSSION AND CONCLUSIONS

This study examined two experienced teachers' pedagogical content knowledge and pedagogical theories of content as manifested in their descriptions and teaching practices. The goal was to describe the teachers' teaching practices in a volleyball unit taught to two different classes and their theories of content. This chapter presents a cross case analysis of the findings by research question from both teachers and discusses the similarities and differences in terms of the existing literature in physical education. This section of the chapter shares some perspectives on how the study helps in our understanding of teachers' pedagogical content knowledge and their theories of content in physical education. The cross case analysis for each question is followed by a series of conclusions. This is followed by a discussion of several implications from the work. The final section presents some recommendations for future research in this area and the significance of the research questions to better preparing teachers to provide quality experiences for all students in physical education and sport settings.

Cross Case Analysis

The cross case analysis presents the similarities and differences in the teachers' practices and theories in relation to the two research questions: What instructional practices do experienced physical education teachers employ in teaching the target content (i.e., volleyball)? What are the teachers' pedagogical
theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

**RQ. 1. What instructional practices do experienced physical education teachers employ in teaching volleyball to elementary students?**

**RQ. 1.1. The Content Taught and the Progression of Tasks**

**Nature of Content Covered.** Both teachers covered similar content in both classes. Anna covered exactly the same skills in both classes. She emphasized the forearm pass and serve, and covered the basic rules of the game of volleyball. She also introduced her fourth graders to the skill of set, but the skill was not further developed. The students practiced the skills in isolation, but also in the context of game-like conditions. Some of the rules of the game were modified to facilitate the students' developmental and skill levels. Additionally, she instructed her students how to officiate their own games.

Irene taught similar content to both of her classes with the exception that she taught her fourth and fifth combined class how to rotate. She covered the serve, set, and forearm pass to both classes. Additionally, she taught some basic rules of the game so that the students could apply them in their games. The basic difference between Irene's and Anna's classes in terms of content covered was that Irene taught the set while Anna did not emphasize it. Both teachers taught the forearm pass, the serve, and the basic rules of the volleyball game.

**Warm-Up.** Both teachers started their classes with a warm-up session. Anna's warm-up sessions were the same for both of her classes, lasted three minutes, and contained the same exercises. Two of the exercises included in the warm-up sessions were related to the content of the unit. Irene's warm-up sessions, on the other hand, were longer, and contained exercises that were
directly related to the content taught. There was little difference in the warm-up
sessions between her two classes.

**Sequencing of Skills.** Anna introduced the skills she taught in the same
order in both of their classes. She started her unit by introducing the forearm
pass which was followed by the serve. Irene also introduced the skills she taught
in the same order in both of her classes. She started her unit by introducing the
serve followed by the set and bump. Both teachers employed game-free and
game-like conditions in which the students practiced their skills.

**Content Development.** Both teachers used a number of different types of
tasks in order to involve their students in practicing and learning the skills of the
game. Anna developed the content similarly in both classes. She progressed the
content in the fourth grade using 3 informing tasks, 9 extending, 7 refining, 12
application, 2 review tasks and 2 applying/refining tasks, a total of 35 tasks. The
fifth grade, on the other hand, engaged in 2 informing, 13 extending, 5 refining,
14 applying, 5 review tasks, 1 extending/refining, and 1 applying/refining, a
total of 41 tasks -six tasks more than the fourth grade. There were some
differences in the content development between the two classes in terms of the
number of the different types of tasks. For example, she employed more
extending, applying, and review tasks in her fifth grade, and more refining tasks
in her fourth grade. Anna employed extending and refining tasks in each of the
lesson in both classes. She also used applying tasks in each lesson with the
exception of the first lesson in the fifth grade. The tasks developed in a patterned
manner daily in that the students of both classes started the lessons practicing
tasks in isolation from game-like conditions, while later in the lessons they were
engaged in game-like conditions. The students of both classes engaged in similar
game-like tasks in all lessons. Both classes ended the unit playing a two on two
These games had the form of an informal mini tournament. In terms of time, both classes spent approximately 50% of the class time engaged in activity. However, the fifth graders spent more time involved in the tasks because their unit was longer by one lesson. The student skill performance in the tasks improved throughout the unit. During game play conditions, the performance of the skills seemed to be less consistent and the games did not have continuity. Some games seemed to be better than others.

The students of both classes were presented with the same exactly strategies and rules; the strategies, however, were not a focal point for the unit. The tasks that were not of game-like nature required the practice of a single skill (i.e., bump or serve only) except for several tasks during the second lesson for the fourth graders. The nature of the task characteristics was the same in both classes. Anna included frequently in the task description some form of accountability measure. The task descriptions and teacher demonstrations offered tended to be short and to the point, especially when the students were dispersed.

Anna followed a consistent pattern of teaching throughout the unit in both classes in terms of sequencing the classroom events and/or teacher behaviors. She gathered the students for introducing a new skill and offered a sequence of tasks in similar organizational arrangements before moving to different organizational arrangement. The number of major transitions was small. During student practice, she engaged in intense active supervision during which she interacted with individual students in order to support their learning.

Irene progressed the content similarly in both of her classes for the most part. She, like Anna, used a number of different types of tasks in order to progress the content. The content progression followed a particular pattern that
was similar in both classes. The first four lessons included more extension and refining tasks while the last two lessons included more applying tasks. In all of her classes, she included extending and refining tasks. After the introduction of a skill for first time, Irene employed several game-free extension and refining tasks before moving the content toward more applying conditions. Although the general pattern of content development was similar and consistent in both classes, there were a few differences in the types of tasks between the fourth grade class and the combined class. For example, the teacher used fewer tasks in the fourth grade class compared to the combined class in the following categories: Informing tasks (3 Vs 4), applying (6 Vs 9), review tasks (4 Vs 5), and initial guided practice (2 Vs 4). She used more tasks in the fourth grade class compared to the combined class in the following categories: Extending (7 Vs 6), refining (9 Vs 6), and review guided practice (5 Vs 3). Irene used more refining and review guided practice tasks in her fourth grade, while she used more applying tasks in the combined class. The fourth graders needed more work on refining the basic skills. Irene used a total of 39 tasks in the fourth grade and 40 tasks in the combined class during the volleyball unit. Because she differentiated slightly between her two classes in terms of the content covered, Irene engaged her fifth graders in the combined class in a few different tasks from the ones she assigned to the fourth graders in the same class. The number of these different tasks was small.

In describing the tasks to the students, Irene included at times all three characteristics of tasks (e.g., goal, organization, and accountability related information), while other times she omitted some characteristic depending on the situation. If the task was to take place in the same organizational configuration,
then the organizational element was not emphasized or it was omitted altogether.

In terms of the allocated practice time, the students of both classes were engaged in tasks for similar amount of time. (i.e., 97:20 and 98:35 minutes for the fourth and the combined classes respectively). The students spent approximately one third (33%) of the class time engaged in tasks. The rest of the 45-minute lessons were spent primarily on either content presentations, including skill and/or task description, skill explanation, and demonstrations, or transition and management. Minimal time was spent on management indicating that Irene managed both classes efficiently.

Anna and Irene had both similarities and differences in their teaching. They both were efficient managers, an indication of effective teaching. The overall class structures were different in nature, since Anna had adopted the sport education model, while Irene used a more traditional structure. Both teachers employed several similar tasks. There were significant differences, however, in the organizational arrangement of the tasks. Irene teamed her students in small groups of four or five to work in the various assigned tasks. Anna's students worked in groups of two. This difference was explained partially in terms of the difference in the space available to both teachers. The larger groups had less opportunity for engagement. Additionally, the environmental constraints Irene encountered may have impacted her choices of tasks.

Another difference between Anna's and Irene's teaching was in the allocation of time. Anna's students were engaged in the tasks for about 50% of the class time, while Irene's students were engaged for about 33%. Although some of this time difference can be explained in terms of the longer transitions in
Irene's classes due to contextual factors, it was clear that Irene took more time to explain the tasks to her students. It was not clear whether the longer explanations and presentations of the skills and tasks improved the quality of students' practice or learning.

Another difference between Anna and Irene was that Anna engaged her students in game-like situations in every lesson except in the first one. Irene engaged her students in game-like conditions mostly after the fourth lesson. This difference could be explained in terms of the different skill level of the students, or the fact that Irene introduced three basic skills while Anna introduced two.

Irene used several guided practice tasks in both classes for introducing her students to new content or for reviewing content already covered. During these tasks, all the students seemed engaged in the teacher-led movements. Anna did not employ the particular teaching technique with her students in this unit. Both teachers, however, used a number of review tasks to give the opportunity to their students to practice the skills that had already been introduced. One of the differences between the teachers was the organizational arrangement during game-like conditions. Anna organized her students in groups of two to engage them in game-like situations throughout the unit. Irene, on the other hand, had her students practice the game-like conditions in groups of four (i.e., 4 on 4) or in groups of seven (7 on 7). These arrangements in Irene's classes can be partially explained by the characteristics of the gymnasium.

One of the similarities between the teachers was that they both were responsive to the students' performance in the various tasks. It seemed that the task progression was contingent upon the students' performance in a task for the most part. For example, when the students needed more time to practice a skill
in order to develop some efficiency or consistency in performing it, the teachers provided the students with more practice time on a particular task.

Another similarity between the teachers was that they tended to progress a few tasks while in the same organizational arrangement and/or similar set of operations. This seemed to be an efficient teaching strategy in that the next content progression did not require organizational information, which may have resulted in focusing the students' attention on a particular content-related aspect of a task, faster pace of instruction, or limited number of managerial incidents.

RQ. 1.2. Content Communication and Teacher Interactions

Task Communication. In order to communicate volleyball content to their students, both teachers provided verbal and visual information. Verbal information included descriptions and explanations of volleyball tasks and was delivered through lecture and questioning techniques. When presenting a skill for the first time, both teachers spent more time presenting information to students. Irene's presentations tended to be more elaborate and detailed and contained more verbal and visual information than Anna's. There was no difference in the amount of information offered by either teacher to their classes.

The task description included information about what was to be performed, the conditions under which the task(s) was (were) to be performed, information about the organization of the tasks and the set of operations embedded in such tasks, and performance criteria to perform the task. Not all task statements included information that addressed all the characteristics of the tasks. Both teachers chose to include information in the task statements based on the familiarity of the students with the general procedures of the class and/or the task at hand. Anna tended to include criterion-related information in the tasks
statements more frequently than Irene. Irene, on the other hand tended to include organization related information in task statements because of the characteristics of her instructional setting. Statements regarding the organization and criterion related characteristics of the tasks were similar in both classes taught by the teachers. The teachers provided clear descriptions of these two characteristics of the tasks, and the students in both classes appeared to have a clear understanding of what was expected of them during the tasks.

When describing the skill(s) that was to be practiced in a task, the teachers used specific critical elements. When presenting a skill for first time and when reviewing a skill, both teachers taught the critical elements they presented to their students in that they clearly identified them and modeled them in isolation and in combination with the other critical elements involved in a skill. Both teachers used simple and clear words or phrases to describe a critical element. Sometimes they presented a series of critical elements in chronological order as when executing a skill, while other times they emphasized the important element(s) involved in a skill. To increase the effect of the presentation of critical elements on students both teachers used similar instructional methods such as repeating a cue, matching two cues in chronological order, matching two cues by contrasting their function, or creating a rhythmical phrase consisting of a series of cues (a mnemonic). Irene tended to use these methods more frequently than Anna. Irene also used voice inflection extensively and paused between words or phrases to create a more dramatic effect or impression on her students. The critical elements used by both teachers were more similar than different, in that they both used critical elements that addressed the major parts of a skill. Irene included more critical elements that addressed more detailed aspects of a skill when presenting a skill for first time than Anna. Both teachers, however,
following the initial presentation of a skill, assigned tasks that contained a limited number of specific critical elements.

Anna and Irene incorporated several explanations in task presentations to communicate the content to her students and enhance their understanding. The explanations addressed the function of a skill in the game of volleyball, a critical element, or an aspect of the game. Both teachers used similar forms of explanations in that they included reasons explaining why something happened or what should be done for something else to follow. Additionally, they used several examples to facilitate students' understanding. These examples attempted to link newly introduced information with information already covered in previous lessons and/or units of instruction. Both teachers either offered explanations in the form of brief lecturing or asked their students to offer their reasoning. Anna tended to ask her students more questions requiring responses that contained an explanation. Explanations were similar in both classes for both teachers in response to student requests to explain or clarify a learning point. Both teachers used different examples to illustrate a point (e.g., a rule) drawing on examples from units they taught recently to their students. Both teachers intermingled their descriptions and explanations with demonstrations to fortify the effect of the task/content presentations on students.

Demonstrations. Irene and Anna provided their students with many demonstrations to clarify and/or assist them see what was to be performed and how it was to be performed. Both teachers used demonstrations that focused on the substance of the task and/or the organizational properties of the tasks, including the organizational structure or the program of action embedded in the task. Both teachers offered many types of demonstrations, including teacher-only, student-only, and teacher-student demonstrations. The student-only
demonstrations tended to be longer since they embodied not only substantive but also organizational information. During the student-only demonstrations, both teachers seemed to take advantage of the occasionally rough or inconsistent student performance to address the component of the task that was incorrectly demonstrated (e.g., skill, rule, or procedure related component) and turned it into a learning moment. Such rather unplanned moments resembled similar intentional non-example demonstrations offered by the teachers. Anna and Irene, however, always made sure that the students had a clear understanding and picture of what was to be performed and how in such occasions. For example, both teachers routinely asked questions to check for understanding during and/or at the end of a task presentation. All student-only and teacher-student demonstrations were described completely, structured well, and executed progressively in terms of the substance and/or procedures involved in the presentation. The same demonstrations were observed in both classes for both teachers when the tasks were the same.

While there were several similarities, there were some differences between Anna’s and Irene’s individual demonstrations. Both teachers, for example, provided examples and non-examples of the skill to be performed pointing out the effects of a correct and incorrect execution of a skill or element of a skill. Additionally, both teachers offered partial and complete demonstrations at different moments in their lessons and used similar environmental arrangements to present skills: they both demonstrated serving against the wall and bumping to oneself. Furthermore, both teachers matched accurately the verbal descriptions of critical elements with the corresponding visual picture of the body parts, body movements or positions involved. Finally, teachers had the students’ attention when they demonstrated because they considered it
important learning time. On rare occasions, when they felt a student was not paying attention, they demanded it and immediately regained attention. One difference between Anna's and Irene's demonstrations was that Anna offered demonstrations that were quick and short while Irene offered demonstrations that were slow-paced, longer, more exact, more elaborate, and more fluent and illustrious. Irene also tended to repeat her demonstrations several times.

**Metaphors.** When presenting tasks to students, both teachers used several metaphorical cues, phrases, and/or examples to explain a critical element, a skill, or some rule or aspect of the game. Both teachers indicated that such devices were used to communicate the content more vividly, help students connect new knowledge with previous knowledge and help them understand the content better and faster. Anna and Irene found the use of such metaphorical cues helpful in teaching and that some of them seemed to positively effect their students.

All the metaphors the teachers used were different except the word "window" which was used to prompt students to place their hands in a specific way above their foreheads. Some of the metaphors were used intentionally in that the teachers used them in both classes and in different lessons to describe an element of a skill. Other times it seemed as though a metaphor or example was a spontaneous heuristic. The origin of such devices seems to be a product of the individual teachers' effort to connect aspects of the content taught to students' past experiences in various contexts. Anna, additionally, indicated that she adopted a metaphor from a student teacher indicating such devices can be acquired/learned.

Anna and Irene taught their students in different ways how to put their hands together to receive a bump. Anna used two metaphorical phrases while
Irene provided a straightforward description of the action. Anna took a few only seconds to describe the action while Irene took longer to describe the same action. The similar presentations took place in both classes for both teachers. Both presentations seemed appropriate in terms of the accuracy and clarity of the description as students appeared to perform the described action similarly well. At one level of analysis, the net gain of these two approaches seems to be a few extra seconds for Anna that can be allocated to other things. A different analysis, however, may show something different.

**Guided Practice.** Irene used guided practice to walk her students through the movements involved in the performance of a skill. Guided practice, according to Rosenshine and Stevens (1986), is when the teacher leads the whole class through a controlled practice condition during which the teacher has the opportunity to correct student mistakes. Guided practice is conducted to correct student errors, reteach the content when necessary, and provide enough practice to elicit confident and firm responses from the students so that they can practice by themselves. Irene used guided practice not only for informing purposes -initial guided practice- but also for reviewing purposes -reviewed guided practice. She used this teaching technique when she introduced the set and the bump but not when she introduced the serve. However, she used reviewed guided practice to review all three skills taught in the unit.

During guided practice sessions, Irene offered teacher demonstrations, verbalized repeatedly and rhythmically the critical elements involved in the skills, and offered prompts and feedback to her students who shadowed her continuously. During that time, she offered individual demonstrations and manual assistance to students whom she felt needed more help. The students were attentive and involved in these sessions. Irene used the guided practice
technique in both classes in the same manner. Anna did not engage in guided practice sessions.

**Class Structure.** Anna structured her class according to the sport education model (Siedentop, 1994). She assigned four captains in each class who were initially responsible for dividing the members of the classes into two large teams. Members of each of the large teams practiced together with different members of their team. At the end of the unit, pairs of students from within the large teams played pairs from the other team. Additionally, the teacher had adopted a point system. The team with the most points at the end of the unit would earn a class award. Points were earned by individuals of a team or the teams. Individual points were contingent upon performance in assigned tasks. Scores were kept by the students and recorded by the captains on cards distributed by the teacher. It appeared that the informal accountability system instituted by the teacher may have influenced the students' concentration, engagement and/or performance in assigned tasks. Anna indicated that this particular class structure taught students to be independent and responsible and that influenced their engagement and possibly their performance in tasks. Anna adopted the same structure in both classes. Irene's classes had a more direct instruction orientation for her class structure.

**Grouping of Students.** Both teachers used different approaches to grouping their students. Anna's students were responsible for grouping themselves. The students chose their own partners but Anna prompted them to change partners frequently. The change of partners was at times random because of a rotation routine the teacher directed. As soon as the tournament teams were formed, the students practiced consistently with the same partner. Teams were decided by team captains and Anna had no involvement in forming them. All the groups in
each class were instructed in and practiced the same tasks (with one exception
during the second lesson in the fifth grade) when four groups chose to remain in
a “two-hit” cooperative game despite the fact that the teacher had just introduced
a “three-hit” cooperative game. The teacher approved of the students’
modification.

Irene used random grouping processes during the first lessons of the unit in
both classes. Later on, however, she assigned particular students to different
groups using developmental and skill related criteria. In the fourth class, all the
tasks assigned to all groups of the students were the same. In the fourth and fifth
combined class, Irene divided the class into two groups: the fourth and fifth
graders. There were a few times that Irene assigned different tasks to fourth
graders and fifth graders in this combined class. The fifth graders experienced a
slightly different curriculum in Irene’s class in terms of content covered through
the assignment of different tasks.

Equipment and Environmental Arrangements. Anna used the training
volleyballs throughout the unit for both classes with one exception. When she
introduced the set briefly to her fourth graders, she used the beach volleyball
balls for few tasks. She also used the beach volleyball for a student with multiple
handicaps throughout the unit. Irene used four different kinds of balls, foam
balls, beach balls, training balls, and regulation balls. She used all four kinds of
balls when practicing the serve. She never used foam balls in any other task. She
used the beach and training balls more frequently than the regulation volleyballs.
She used the regular volleyball selectively in that she only allowed a group of
fifth graders and a group of fourth graders in the combined class to practice with
this ball during some modified games toward the end of the unit. Most of the
time during game play she used training balls with her fifth graders. For Irene, the use of different balls was an important part of her task progression.

Anna and Irene were affected by different environmental arrangements in their settings. While Anna had two full volleyball courts, Irene had only one. Both teachers, however, created four courts with about the same height of net. Anna's courts were longer and wider while Irene's were shorter and narrower. Additionally, Anna taught in a gymnasium twice as large as Irene's. This gave Anna more space for her students to practice and learn the content. For example, during the serve against the wall task, which was part of both teachers' progression, Anna's students were grouped in pairs and were given one training volleyball ball per two, while Irene's students were grouped in groups of four or five and were given one ball for the group. Naturally, Anna's students had at least twice as greater opportunity to practice the serve in the same unit of time as Irene's students. The same was the case in many other tasks and space not

Pedagogical content knowledge or pedagogical expertise was the key factor here. The difference in space available seemed to affect the teachers' allocation of instructional time and at times choice of tasks. Irene, for example, had to spend considerably more time organizing her students and transitioning them in larger groups in a smaller space. Additionally, her choice and/or organization of tasks was affected by the conditions. Anna, for example had all the students in groups of two practicing the serve across the net at the same time. Irene could not have achieved the same level of engagement as Anna given her gymnasium. Instead, she used the shower serve task which addressed the same skill, serving, but under different conditions. The different environmental conditions created different instructional and managerial demands for both teachers, which, in turn, seemed to affect student opportunity to learn.
**Teacher Interactions.** Both teachers actively supervised their students. Both monitored and interacted frequently with students, moved briskly about the gymnasium, offered many individual demonstrations and instructions, and provided manual assistance to students they felt needed it. At times Irene involved herself in tasks students were practicing by operating as the tosser/leader. Most of the interactions were individual in nature although at times they offered some comments to the entire class or to a group of students working on a court. Both teachers provided direct, descriptive statements but they also asked questions of their students. Anna tended to ask more questions and created more exchanges than Irene. Both teachers' interactive comments were positively stated and most of the time included the student's name.

The vast majority of the verbal comments offered during student practice were content related and were in the form of a prompt, feedback, and individual instruction statement. When students were practicing a task that involved the use of a skill, the focus of the teacher's interaction was on some critical element involved in the performance of the skill. Some times a few comments focused on the organizational procedure. When the students were practicing in a game-like condition, some teacher comments addressed the rules of the game, others the set of operations within the structure of the game/task and, or use of a particular skill within the context of the game.

In these exchanges both teachers used critical elements that had already been introduced during the initial presentation of the skill. At times Anna used critical elements that had not been addressed in the initial presentation of the skill. In such cases, the students seemed to clearly understand the critical elements used by the teacher to address their performance. Both teachers at times matched two critical elements to create an antithesis (e.g., use the finger
pads not the palms); other times they included two critical elements to stress the sequential function of the two elements (e.g., lean back and then step); other times they included in the feedback statements not only the critical element but also its function (i.e., use your legs to get more power).

During their active supervision, both teachers seemed to interact with their students in different ways depending on the students. Irene, for example, modified the task several times for a student whose developmental characteristics did not seem to match those of the rest of the class. She made the task easier for one of her students by lowering the net or making a less challenging toss. Other times she gave some of her students more chances to respond until a response was successful. Anna also tended to spend more time assisting particular students who were new to the school or had some particular difficulty with some skill.

Both teachers tended to use certain critical elements in particular skills. Teachers' interactions with students took place in a positive learning atmosphere. Both teachers had students' attention when commenting on their performance and they appeared to incorporate the feedback in the following response no matter whether the teacher was watching or had already moved to a different place in the gymnasium. Both teachers had established and functioned in well ordered class environments. Both teachers cared about their students and their learning, and both had the respect and credibility of their students.

Conclusions about Teachers' Pedagogical Content Knowledge

Both teachers exhibited teaching behaviors that reflected pedagogical content knowledge. Pedagogical content knowledge refers to teachers' understanding of the content for pedagogical purposes. This understanding
manifests itself in the teachers' practices through the use of representations or transformations of subject matter, including metaphors, analogies, examples, demonstrations, class activities, tasks or assignments (McDiarmid et al., 1989; Wilson, et al., 1987). Doyle (1992) maintained that content is represented in classrooms through learning tasks and that the same content can be represented by fundamentally different tasks. Moreover, Siedentop (1991) stated that developing progressions of learning tasks requires and reflects knowledge of content and knowledge of teaching. Teachers' practices concerning the progression of learning tasks was a substantive part of their pedagogical content knowledge and a dominant focus on this study.

Both teachers developed the content progressively using different types of tasks. The use of a variety of progressive tasks has been linked to student gains in terms of skill development (French, Rink, Rikard, Mays, Lynn, & Werner, 1991; Rink, French, Werner, Lynn, & Mays, 1992). Both teachers exhibited different patterns of task progression. For example, Anna, with the exception of the first lesson, included applying tasks systematically in every lesson. Irene, on the other hand, used more extending and refining tasks in the first four lessons and increased the number of applying tasks in the last two lessons for both classes. Both teachers used extending and refining tasks after introducing a new skill and before using any applying tasks. The use of refining tasks has been associated with significant student skill improvement (Masser, 1985, 1993). The content development patterns in terms of the types of tasks employed were more similar than different across the two classes each teacher taught.

It was found that the two teachers sequenced and progressed the content predominately through similar tasks in both of their classes. Anna progressed
the content through identical learning tasks in both classes. The tasks may differ slightly in terms of focus, but they took place within the same organizational structure. Irene, on the other hand, sequenced and progressed the content through similar tasks in both classes for the most part, but she also differentiated the content and tasks between the two classes. She provided her fifth graders with a little more content and engaged them in a few more tasks than she engaged her fourth graders, especially toward the end of the unit. One would expect that since fourth and fifth graders reflected different developmental levels, and had different backgrounds in terms of learning experiences in volleyball, provided a different context as two different groups of learners. A teacher in order to "tailor" the content to student abilities would have designed and progressed tasks with more different than similar organizational conditions between the grades. It seemed that for Anna, the organizational structure of a task was such that it served both classes equally well (i.e. fourth and fifth graders). On the other hand, fourth and fifth graders' developmental levels in volleyball in this school may be so similar that employment of tasks with different organizational conditions was not necessary. The same may be the case for Irene, especially for tasks following the introduction of new skills; as the unit progressed, however, she felt that certain organizational arrangements could provide better practice of the same skills.

Anna and Irene considered their students' responses in developing the content. Irene, for example, spent a total of 4:55 minutes on the serve against the wall with the combined class in the first lesson (see Table 1), while she spent a total of 7:45 minutes on exactly the same task in terms of condition with her fourth grade class. In doing so, she employed only two tasks in the combined class (i.e., one I and one R) while she used four tasks (one I and three R) in the
fourth grade class. Similarly, Anna in the first lesson progressed the content similarly in terms of type of tasks and time spent on tasks in both classes. She had expected her fifth graders to be at a higher level of competence since they had more extensive background in volleyball than the fourth graders. These content development patterns reflected how responsive and adaptive the teachers were to the teaching conditions and students' level of performance.

Both teachers exhibited consistently a content progression pattern related to the organizational conditions of the tasks in both classes. For example, as soon as they stated the goal and organizational conditions of a task, both teachers would expand the content by changing the goal of the task but not the organizational condition. They mostly used refining, extending, or applying tasks for two or three times before changing the organizational structure. This created an efficiency in their teaching in that they did not have to include organizational information in each task statement making the task description more efficient and possibly more effective. This can be interpreted as an indication that the teachers had a clear understanding of how they could use the same organizational structure of a task in order to advance certain elements of the content embedded in the task. Having a wide repertoire of representations has been considered a characteristic of pedagogical content knowledge and a teaching strength (McDiarmid et. al., 1989). It could be reasonable to argue that knowing how to use a particular organizational task structure in several ways to advance the learning experience of the students is a particular kind of pedagogical content knowledge. From this perspective, Anna and Irene demonstrated pedagogical content knowledge.

If McEwan and Bull's (1991) argument that all knowledge is pedagogical in nature, then having a large number of representations may not be a
characteristic of teachers only. McDiarmid et al., (1989) suggested that not only should teachers possess a rich repertoire of representations, they should also have accurate representations and be able to employ them appropriately. They suggested that instructional representations represent or reflect knowledge about subject matter, learning, pupils, and context. Citing Ball (1988), McDiarmid et al., (1989) stated that
good representations (a) correctly and appropriate represent the substance and the nature of the subject being taught, (b) are comprehensible to the particular pupils one is teaching, (c) contribute helpfully to learning, and (d) are reasonable and appropriate in the context.

Based on these criteria, were Anna's and Irene's tasks (and/or task representations) appropriate? One should appraise carefully the appropriateness of specific tasks, a particular sequence of tasks, or the unit altogether. Both teachers expressed their overall satisfaction in terms of student skill improvement at the end of certain lessons and the units. Both teachers also stated that the overall result could have been better if certain contextual factors including time allotted to the unit were different. Both teachers felt that their students' game performance could have been better but they felt their students enjoyed their participation in the games. And both teachers felt that the fifth graders had, overall, performed better than the fourth graders. Although these accounts portray how the teachers perceived their students' performance in the units, they do not shed light on the question of task appropriateness and how well they addressed the unit goals.

The vast majority of students for both teachers seemed to be appropriately engaged in the unit tasks. Some tasks seemed to result in more student success than others. In general, when a task had a single focus (i.e., bumping to one self; serving against the wall; serving over the net), took place in a non-game
condition, and/or the students had familiarized themselves with the task and/or
skill, students in all classes seemed to perform more successfully. In game-like
conditions which typically involved the use of two skills (i.e., serve and bump)
the students lacked consistency in successfully performing the skills. There were
occasions when certain students or groups seemed to perform reasonably
successfully. There were also students who did experience continuous success.
On the basis of these observations the question of task appropriateness, in terms
of how well the tasks employed were well aligned with the goals of the unit,
remains unanswered.

In teaching the particular units, both teachers chose a skill-to-game
approach which reflected the perspective that certain skills have to be learned
and established to an extent that allows students to participate with reasonable
success in a lead-up or modified form of the game. It seemed that at times some
tasks were situated closer to a game condition while other tasks seemed to be
isolated from a game-like context. Some of the isolated from a game-context
tasks can serve well a particular aspect of skill development or characteristic of
performance if carefully chosen. However, tasks closer to a game-like context
may be more relevant, efficient, and result in more meaningful learning
experiences. For example, serving the ball against the wall is different from
serving the ball across the net, the second being closer to a game context. On the
other hand, a task in a close to a game-like context does not guarantee its
appropriateness. Anna and Irene designed tasks that were distant from but also
close to game-like contexts. Were all of them appropriate and/or well aligned
with the instructional goals?

The task of tossing a ball across the net and having a partner set it back
seems to be a good task and close to a game-like context. The presence of the net
invites the students to set the ball high enough to go over the net and, at the same time, encourages him/her to use the biomechanical functions of the body in a more efficient and possibly more correct manner. At the same time, this task may not address the game concept of how to play a free ball, or how to cooperate with a teammate. The game of two on two using the skills of serve and bump with one player on the back court and the other on the front court may not serve the goal of passing the ball over the net on the third touch. Serving the ball across the net and receiving it using the set may invite students to use an illegal, and possibly, unsuccessful set. All of these tasks include some characteristics that may compete with the goal of advancing the skills and/or concept of the game. Both teachers included tasks that did not seem to promote efficiently the volleyball game of fourth and fifth graders. These instances were examples in the teachers' pedagogical content knowledge that may not be considered as appropriate representations. Estimating accurately the appropriateness of a task or representation is certainly a challenge.

Both teachers progressed the content in ways they felt were appropriate for their students. Rovengo (1991) observed preservice teachers' pedagogical content knowledge increased in terms of appropriateness and was reflected in the tasks and progressions they designed for their students. The student teachers' appropriateness of representations increased with experience in teaching. Anna's and Irene's task representations were developed considerably as both were veteran teachers. If one accepts the appropriateness of certain task representations of both teachers, one must consider the role of content knowledge in designing appropriate tasks for particular students. Both teachers did not consider themselves experts in teaching volleyball. Anna's background in volleyball was insubstantial while Irene's background was considerably richer.
If Anna's inappropriate task representations were a result of her weak content knowledge, what could possibly explain Irene's questionable task representations? Brophy, (1991) stated that the relationship between subject matter knowledge and pedagogical content knowledge may be nonlinear. He also stated that:

Perhaps there is an optimal breadth and depth of subject matter knowledge for teachers working at any particular grade level, such that additional subject matter knowledge beyond this optimal level would be counterproductive because (1) it would never be needed for teaching the content that this teacher teaches, and (2) by adding nonfunctional complexity to relevant knowledge networks, it would make it more difficult for the teacher to select appropriate content to teach to students and to transform it into pedagogical content knowledge. (p. 356)

A characteristic of the teachers' tasks representations was that both teachers reacted to diverse needs with flexible performance structures. Anna allowed the students to bump the ball after it bounced if they could not bump it on the fly. Both Irene and Anna allowed the students to serve the ball from a closer to the net distance. They both had lowered the nets to facilitate student performance in game-like conditions. They both used training and beach balls. Irene, additionally used foam and regulation balls as opposed to using only regulation balls. She felt this eased the stress felt upon contact. This flexibility can be interpreted as an indication of pedagogical content knowledge in that they were representations attempted to make the content appropriate for individual students that needed it without trivializing or hurting the integrity of the game. This embedded to the tasks flexibility might explain partially the fact that both teachers planned eventually the same tasks for both of their classes. Finally, this flexibility constituted evidence of the teachers' knowledge of their students' performance capabilities.
Anna's and Irene's pedagogical content knowledge was also evident in their task statements and interactions with students during practices. In stating the tasks, they both used metaphorical expressions to link the content they taught with their students' level of understanding or knowledge acquired in previous units. Grant (1992) stated that teachers use metaphors to mediate and transform their knowledge of content, pedagogy, students and self into classroom actions. Shulman's (1987) conceptualization of pedagogical content knowledge was the teachers' competence in using metaphors and examples to transform content to students. Nikolajsen (1991) noted that the pedagogical value of metaphors can be beneficial when a teacher knows what his/her students know and how they think; if a teacher, however, lacks such knowledge, the use of metaphors can be counterproductive in that they may generate more confusion than understanding. The use of metaphorical expressions by Anna and Irene, although present, were neither extensive nor frequent. They seemed to be chosen based on what the teachers thought and knew that their students knew. Few of them were used in both classes indicating that they were chosen because the students seemed to understand them. Both teachers felt their students seemed to respond positively indicating understanding of such expressions and/or examples.

It should be noted that the emphasis placed on the conceptualization of pedagogical content knowledge in terms of the use of metaphorical expressions, analogies, and examples might have been considerably influenced by the fact that the term pedagogical content knowledge originated from the "Knowledge Growth in Teaching" research project directed by Shulman and colleagues at Stanford University which took place with teachers of English and Social Studies. It may be that such expressions do not lend themselves easily in other subject
matter areas such as physical education. The infrequent presence of such metaphorical expressions in Irene's and Anna's presentations of content might indicate that the presence of pedagogical content knowledge in physical education may be more closely associated with assigned tasks and progressions, and nature of content communication, including demonstrations and teacher interactions with students.

Anna and Irene communicated content to students with clarity and precision through demonstrations, appropriate and clear task descriptions, and interactions with students while engaged on a task. Werner and Rink (1989) found that the use of critical elements in terms of quality and quantity, demonstrations and explanations improved effectiveness. Rink (1996) stated that verbal and visual information (i.e., use of cues and demonstrations) is effective an way to communicate clear student understanding. Irene and Anna provided their students with clear explanations, appropriate demonstrations, and accurate cues and/or critical elements of the skills. The number of critical elements included in task presentations varied depending on the type of the task. Although informing tasks contained few cues, most other tasks contained from 1 to 3 cues. Cues were not only verbalized but also demonstrated with precision. At times the cues were sequenced chronologically, contrasted, repeated, and/or rhythmically uttered in combination with a visual demonstration. This contributed to clear and vivid task communication. Additionally, the incorporation of questions and direct explanations during the task presentation created a learning oriented environment. Leinhardt, Putnam, Stein, and Baxter (1991) defined explanation as "an activity in which the teachers communicate subject matter content to students" (p. 88). From this perspective, Anna's and Irene's explanations constituted instances of pedagogical content knowledge.
Both teachers' task communication processes resembled closely the guidelines for effective presentations suggested by Rosenshine and Stevens (1986). The accurate description of one or two cues using an example and non-example of a visual demonstration of the function of the cues provided a particular content representation that reflected pedagogical content knowledge and appeared to have an effect on students. The students seemed to have a clear understanding of the task and the teachers did not have to re-explain a task to the class; both indications, according to Brophy and Good (1986), are associated with effective teaching behaviors.

Another example of vivid task communication was Irene's use of guided practice. She described the skill and/or prompted her students to perform a small sequence of cues while demonstrating the skill. Guided practice, although a teaching technique by definition, contains elements of pedagogical content knowledge such as teacher demonstration, critical element verbalization, and instances of content specific feedback.

The teachers' interactions with students during their engagement provided indications of Anna's and Irene's pedagogical content knowledge. They provided students with frequent and content related feedback. The content specific elements addressed major critical elements of the skills taught (i.e., leg and arm actions). Irene's feedback tended to be more detailed. Both teachers used different ways to describe the same critical element indicating they had alternative ways of representing the critical elements to their students. Although the research on feedback in physical education is not definitive as to its effect on student learning (Lee, Keh, & Magill, 1993; Rink, 1996), traditionally it has been treated as an effective teaching strategy. Irene's and Anna's content specific feedback, frequent manual guidance, individual visual demonstrations they
provided their students during practice along with task modifications for particular individual students indicated the presence of situation specific pedagogical content knowledge.

RQ. 2. What are the teachers' pedagogical theories (and/or educational beliefs) of volleyball and to what extent are they manifested in their practices?

The Teachers Pedagogical Theories of Content

Background and Knowledge in Volleyball. Irene and Anna had different backgrounds in volleyball. Unlike Anna, Irene had a relatively active background in volleyball since she took courses in college, participated in intramural tournaments during high school and college, coached volleyball, and participated occasionally in recreational volleyball games. She also had a love for the game and enjoyed playing. Anna had limited participatory experience since she had participated in a recreational league for only one season. Both teachers stated they watched the game for leisure and learning purposes. Neither considered herself an expert in volleyball in terms of their knowledge but felt they knew the game well enough to teach it to elementary school children. Irene considered her knowledge of volleyball stronger in the basic skills of bump, serve, and set but no longer as knowledgeable in spiking, blocking, and the strategies of the game since she did not teach those skills to elementary school children.

Reasons for Teaching Volleyball. Both Anna and Irene supported the presence of volleyball in their curricula because of its lifelong recreational value. They both enjoyed teaching it and wanted their students to learn and use the skills, experience success, and enjoy participation in the game throughout their lives. Irene considered volleyball a "nice" game for elementary school children.
because it was simple, had simple rules, and, unlike basketball, when played correctly, the students did not have someone "right up in their face" trying to get the ball away. Irene thought this characteristic of the game may help students who are not as aggressive to "build up a little bit of confidence" when participating in the game.

Neither teacher considered volleyball a popular sport in their respective communities. Irene, however, considered the lack of popularity in her community a positive attribute for her teaching because the students' skill level, in contrast to basketball, was more even and, as a result, the students were more cooperative, more enthusiastic, and willing to learn the game. Anna, on the other hand, considered the lack of opportunities outside the school and, in her view, the difficult nature of the skills of volleyball affected her students' level of play and success in class. As a result, she felt she had to make adjustments in her teaching concerning the pace of progressing the game toward applying forms of engagement (i.e., modified games).

The Volleyball Unit. Both teachers indicated that their generic instructional goals for their volleyball unit were no different from other units of instruction in their curricula. Anna and Irene wanted their students to learn the skills and rules of the game, be able to experience success when using these skills and knowledge in game-like conditions, cooperate, and enjoy participating in the game. Additionally, both teachers had specific volleyball goals, some of which were similar while others were different. Their instructional approaches to teaching volleyball units had certain similarities and differences too.

Both teachers were remarkably consistent in terms of what they planned to do and what they did. Anna planned to teach the bump and the serve in both classes and, if there was time and her students showed signs of success in the
two skills, she planned to teach the set as well. Irene, on the other hand, planned to cover the serve, the set, and the bump in both classes. Both teachers indicated they would teach the rules of the game as well as some simplistic strategies as their students' participation in the games unfolded. Both teachers taught the rules of the game and addressed some strategies as they had stated. One of the differences between the two teachers was Anna’s emphasis on teaching volleyball officiating which she did throughout the unit in both classes. She anticipated accurately her fifth graders' more fluent officiating performance than her fourth graders on this instructional goal.

There were certain differences and similarities between the two teachers in terms of their decisions regarding choosing and structuring the content of their units. Although Anna and Irene planned to cover the bump and serve, they chose to introduce them in a different order to their students. Irene taught the bump last because she felt it was the most difficult of the three skills she planned to teach. Anna, on the other hand, taught the bump first even though she also felt it was a difficult skill for the students to learn. Irene started her unit by introducing the serve first. Interestingly enough, both teachers felt that the underhand serve was the easiest of the three basic skills. Irene said to her students that they would start with the serve because it was the skill that starts the game and she was particularly concerned students develop some confidence in using the skills. Had she started the unit with a difficult skill, it might have been more difficult for her students to experience success and build up their confidence. Anna also wanted her students to be successful in using the skills. That the teachers structured the content differently, given their similar view in terms of the difficulty of serving, might have something to do with their knowledge and concern for students. Another plausible explanation might be
that Anna wanted to expose her students to bumping for longer time independently from the time allocated to practicing the particular skill. Finally, that Anna wanted to move quickly into a game like situation might have made her think that the bump had to be established quickly so that the chance for a rally during a game could have been greater.

Another difference was that Irene planned to teach the set following the introduction to serve, while Anna made teaching the set contingent upon her students' ability to manage the serve and the bump. Anna felt that the set was the most difficult skill to learn because it was very hard for students to perform a legal set. Irene, on the other hand, felt that the set was easier to learn than the bump. Anna, however, had an additional reason in mind. She stated that it was very difficult for her students, when officiating, to discriminate between a legal and an illegal set and it might be a source of confusion and/or disputes among the students. Additionally, given that one of Anna's learning structures was to have students coach each other while practicing the skills, she was concerned with her students' ability to coach each other in the skill of "set" due to the subtleties of the skill concerning the use of fingers and palms.

Irene and Anna were different in terms of what skills could be involved in game play. Anna felt that students could play the game using the serve and the bump. In fact, she introduced these two skills. She justified her belief on the grounds that her students could use the bump when the ball was low or wait for a high ball to get low and hit it. She also felt that it was going to be difficult for her students to switch the hand position from a set to bump or vice versa in a game condition. Irene, on the other hand, taught her students in both classes to discriminate when to use a set (i.e., when ball is above shoulders) and when to use a bump (i.e., when the ball is below the waist) during the game.
Another difference between the two teachers was that while Anna planned and taught the same content to both classes, Irene planned to cover more content with her fifth graders in the combined class since the fifth graders were developmentally more advanced. Both teachers covered the rules of the game and expected students to use them during their games. Anna, additionally, taught her students in both classes how to officiate their own games. The content Anna taught and the tasks she assigned to her students in both classes were remarkably similar, even though there was a difference during the second lesson in the fourth grade when she introduced the set briefly. Irene also taught the same content to both classes and used similar tasks for the most part.

When teaching the same skills, there were both similarities and differences between the two teachers in terms of task selection. Most of the differences were the number of students involved a specific task (one, versus two versus three students etc.), the space used and the set of operations embedded in these tasks. Irene and Anna also differed in how they structured game-like conditions. Anna had her students involved in pairs' games throughout the unit. Irene's game-like conditions varied, involving students in groups of four to seven. These differences seemed to be influenced by the contextual characteristics of the two gymnasia and possibly the teachers' pedagogical content knowledge.

In assessing their units in terms of student improvement, both teachers felt that their students' skill level improved. At the end of her unit Irene felt that, even though her students were not able to use the skills all the time with 100% success, there was "an appropriate amount of progress" since her students knew the skills and were able to get in position and use the skill at their level of competence. She also felt that her fifth graders developed their game skills more than all the fourth graders in either of her classes. Finally, she felt that her
students enjoyed their participation in the game-like conditions during the unit. Anna, likewise, felt that all her students improved their skill level considerably. Their performance toward the end became more consistent in terms of the skills of serving and bumping the ball. Anna felt that team-play performance was rather low when considering the number of times the students could pass the ball to each other. Finally, she felt that her fifth graders performed their officiating tasks better than her fourth graders.

Both teachers' practices were remarkably consistent with what, how, and why they planned to teach the volleyball units to both classes. Both teachers' planning and teaching practices were grounded in their pedagogical knowledge and beliefs about the content they taught as well as on their knowledge of context and the students with whom they worked.

Conclusions about Teachers Pedagogical Theories of Content

The second question of this study examined the teachers' theories of content and how these theories were manifested in their practices. Studies examining teachers' beliefs, values, and knowledge of subject matter have shown that teachers' teaching practices are informed by their beliefs and knowledge about students and how they learn (Carter, 1990; Clark & Peterson, 1986; Fang, 1996; Pajares, 1992). Clark and Peterson (1986) concluded that "Teachers do have theories and belief systems that influence their perceptions, plans and actions" (p. 292). Additionally, there have been arguments that teachers' orientations, including conceptions and beliefs toward the subject matter they teach influence what and how they teach (Ball, 1991; Brophy, 1991). Doyle (1992) has argued that teachers have powerful theories of content that have effect on their teaching practices.
Both teachers in this study had theories of content which informed their teaching decisions and practices in a congruent manner. Additionally, both teachers' theories of content had several common and different elements. The teachers' theories of content contained a generic element that cut across all the instructional units they taught in their respective schools independently. For example, both teachers' instructional goals for both units were similar with instructional goals for other instructional units. A common goal for both was to teach their students the skills and the rules of the game so they would be able to use them with some proficiency in game play conditions, along with cooperative skills. What was differed between the volleyball units of instruction and other content units in their schools was the very nature of the content taught, that is, volleyball. Their particular concerns about teaching volleyball constituted the focus of the teachers' theories of teaching volleyball.

The two teachers had similar perspectives in terms of what to teach in that they both taught the forearm pass, the underhand serve, and the basic volleyball rules. But they had different perspectives here also as Irene taught the set while Anna did not emphasize it. Anna emphasized the development of officiating skills while Irene did not. Moreover, both teachers sequenced the content for teaching differently. Finally, in teaching the game skills and knowledge, they employed a few similar but mostly different tasks and teaching strategies. Their perspectives regarding what and how to teach were reflected in their descriptions of the specific goals as well as in their practices and were grounded in their theories of teaching volleyball. This finding was consistent with the findings reported by Grossman et al. (1989), who stated that teachers' subject matter orientation influenced the teachers' choice of content and choice of activities. Gudmundsdottir (1990a) also found that teachers' value orientations...
toward the subject matter do influence teachers' curricular practices, including their choice of content.

Both teachers taught content to their classes they considered appropriate for the students' developmental and skill levels. The teachers based their content and task choices on different understandings or conceptions of difficulty level involved in the skills they taught as well as their knowledge of the contexts where they worked.

The teachers' theories of content seemed to have been influenced by one or more sources, including the teachers' own teaching experiences, personal philosophies, the school curriculum, their formal training in the particular content area, and their participatory experience. The sources of influence were more different than similar for Irene and Anna. And even though they both taught volleyball to elementary school children, their school contexts were very different which may have shaped their personal knowledge and beliefs about volleyball in different ways. By the same token, both teachers had taught volleyball for many years to children of similar ages. This may constitute an important source of information for both teachers which may partially explain the similarities in their theories of content. Irene seemed to have richer background in the particular content than Anna. Both teachers were veteran teachers, had highly developed pedagogical skills, and both employed effective teaching strategies. It is very difficult to attribute their teaching effectiveness to some of the aspects of their theories of content. Their knowledge of content, pedagogical knowledge, knowledge of their students, as well as their knowledge of the particular contexts in which they worked in was filtered through their beliefs and knowledge that informed their practices and vice versa. Elbaz (1983) called this combination of the various types of knowledge practical knowledge.
In physical education Ennis and Zhu (1991) found that the teachers' value orientations affect the teachers' choice of content and tasks when teaching. Ennis, (1994) stated that "when knowledge and beliefs are examined separately, it is difficult to conceptualize the full impact of beliefs on teaching and learning" (p. 175). Rauschenbach (1992), Dyson (1993), Tsangaridou (1993), and Romar (1995), reported that the teachers espoused curricular values and beliefs influenced their teaching practices. To what extent these curricular values and practices are informed, however, by the teachers content specific theories is unclear. The teachers' strong or weak personal affiliation with a particular content area may, at times, assume and hence play an important role in their teaching practices which, in turn, may affect considerably students' predisposition toward and learning of a particular content.

Investigators of teachers' beliefs have stated that it is difficult to separate beliefs and knowledge (Pajares, 1992; Grossman et al., 1989; Brophy, 1991). Peterson, Fennema, and Carpenter (1991) concluded that teachers' pedagogical content beliefs and knowledge are interconnected in such a way that the distinction between knowledge and beliefs is questionable. Brophy (1991) argued that:

The very term "knowledge" implies that the teachers' thinking is valid and verifiable against the relevant facts. Actually, however, not only teachers' subject matter orientations and beliefs but also pedagogical content knowledge is subjectively constructed and thus open to distortion because of misinformation acquired from others, misperceptions or misinterpretations of classroom experience, the operation of defense mechanisms, and other factors. Perhaps we should refer to pedagogical content beliefs rather than to pedagogical content knowledge. (p. 357-8)

The difficult task of separating beliefs from knowledge in teaching was also addressed by Leinhardt, (1990), who stated that:
... trying to filter through the belief systems and actions of experts to determine which parts of the craft knowledge are significant for teaching and which parts are irrelevant or based on superstition.... [N]ot all experts' opinions about teaching are correct... [And as] there are pieces of craft knowledge that are probably "true" in some situations, there are other circumstances that render them inaccurate. (p. 19)

This study showed that at least both these teachers have theories of content grounded on knowledge and beliefs about the specific content. Starting a unit of instruction by teaching the forearm pass or the serve, omitting teaching the set or underhand serve, leaving out the tactical component of the game or emphasizing officiating represent different perspectives in teaching a unit of volleyball. Which practice will yield better, more efficient results? Whether these theories are adequately informative and whether they are based on "correct" knowledge and how they influence the students' learning warrant closer examination.

Implications

Floden and Buchmann (1990) stated that for a distinction of a category of knowledge to be useful, the category should be a) clear and b) important. Shulman's category of pedagogical content knowledge clearly met the second criterion in that it captured a central theme or concern -possibly the most important- of preservice and inservice teacher education. Furthermore, even though the concept of pedagogical content knowledge has at times been characterized as "amorphous," it has gained the attention of researchers in various subject matter areas. In physical education, this clarification has started to emerge through theoretical elaborations and research efforts. Based on the results from this study as well as earlier studies in pedagogical content knowledge a few implications are presented.
Teacher education has been criticized as being organized around a compartmentalized approach to knowledge rather as an integrated whole. Pedagogical content knowledge reflects a more integrative approach to conducting teacher education because it encompasses both subject matter and pedagogical knowledge. Teacher education methods and content courses should be structured and integrated in such a way that prospective teachers will have multiple and repetitive opportunities to develop a wide repertoire of content representations to help teachers transform successfully their content knowledge into pedagogically sound and meaningful learning opportunities.

Content courses should cover adequately the game components, including the skills and strategies. Appropriate pedagogical knowledge and adequate content knowledge will provide teachers with the necessary knowledge to develop and deliver meaningful learning tasks and progressions that relate directly to the activity taught – what Siedentop, (1996) has called authentic physical education. The relationship between the isolated tasks and tasks that resemble the actual sporting activity needs to be more clearly described and taught in the teacher preparation programs. Additionally, the development of alternative approaches to teaching game skills, including not only the skills but also the tactical components of the game should be addressed.

The development of skill analysis competencies and communication skills grounded in the use of unambiguous language the learners can understand will contribute to effective teacher communication skills. Designing prospective teacher assignments aimed at learning a wide variety of cues to describe a particular skill, learning how to sequence them in chronological order, matching them in terms of opposite functions, combining them with a visual demonstration accurately, and learning alternative ways of describing and
explaining a particular aspect of a skill or game might contribute significantly to developing the teachers' representation techniques. Rovengo (1992; 1993; 1995), O'Sullivan & Tsangaridou (1992), Tsangaridou & O'Sullivan (1994) emphasized the importance of field experiences for the development of teaching capabilities, including pedagogical content knowledge and reflective capacities. Providing prospective teachers involved in field experiences with the opportunity to teach the same content to several grade levels under appropriate supervisory support and guidance will offer prospective teachers the opportunity to learn, develop, challenge and refine their knowledge and teaching skills about how to develop the content and what it means to know the content pedagogically for different settings, learners, and contexts.

The question of how much content knowledge is required for a teacher to be an effective teacher continues to generate discussion among teacher educators. Both teachers ran practices very efficiently and their pedagogical knowledge and expertise was evident. At the same time, both teachers did not feel that volleyball was a particularly strong unit of instruction yet there was a substantial experiential difference. Both, however, felt they had adequate knowledge for teaching the content to elementary school children. In the high school this may not be the case in that teachers probably need more content knowledge. In the elementary school, however, the focus of the training may be the development of pedagogical skills.

The elementary school curricula include a wide range of general and specialized motor skills which are taught for short periods of time. As a result, the elementary school students get exposed to various skills rather than spending considerable time on learning them. Siedentop (1996), based on the argument that "less is more," argued for an authentic physical education grounded in
contextualized performance capabilities (i.e., authentic outcomes). He stated that "... playing the game competently, completing a planned floor exercise routine, performing a folk dance in costume to an audience, and completing a planned double-Dutch rope routine would all provide opportunities for authentic assessments" (Siedentop, 1996, p. 251). The development of contextualized or authentic performance capabilities, however, requires the allocation of sufficient time to practice and learn the skills and tactics involved in a sport activity. Teaching fewer activities for longer time might be an alternative approach to conducting elementary physical education. If physical education is to result in authentic performance capabilities, teachers and policy makers need to consider the "less is more" argument, and institute structural curriculum changes for effective curricula to operate in educational context.

The study of pedagogical content knowledge in physical education focusing only on how teachers explain content to their students or on the teachers' knowledge structures and networks won't reveal sufficiently and completely the nature or character of pedagogical content knowledge in physical education. The study of tasks in terms of their goals, progression, structural and operational characteristics (i.e., the embedded program of action in a task), and relationship to the nature of the activity and the goals of the unit should be focal points in the study of pedagogical content knowledge in physical education.

Recommendations

Pedagogical content knowledge is a powerful and promising concept in the field of physical education as well as in other academic areas. In the near future more research efforts should be focused on this direction because of the centrality it occupies in the teaching profession.
When designing a study to investigate teachers' pedagogical content knowledge, researchers need to include in their designs evaluation of student learning as well. It is not sufficient to assume that representations of subject matter, including tasks, analogies, metaphors, examples, and so on will automatically result in easier or better understanding of the subject matter by the student. Sensitive observational instruments for assessing teachers' pedagogical content knowledge itself, and teachers' pedagogical content knowledge in combination with assessment of students' learning are needed.

To better understand the origins and sources of pedagogical content knowledge, it will be useful to consider in-depth the teachers' knowledge of subject matter, their pedagogical content knowledge as well as their subject matter orientation. It will be possible then to gain a richer, more comprehensive understanding about the nature of teachers' teaching practices.

The systematic study of pedagogical content knowledge in a particular content areas across all grade levels will be useful in that it will inform teacher and teachers educators about the nature and manifestations of pedagogical content knowledge in various grades. This, in turn, will inform curriculum development that might be characterized by systematic continuity.

A multiplicity of research methodologies, including quantitative and qualitative approaches should be used to capture and record teachers' pedagogical content knowledge, their teaching behaviors and effects on student learning. Interviews, textual materials, field notes, videotaping of the teachers' and students' behaviors and interactions, use of stimulated recall techniques and post lesson interviews are appropriate data collection techniques.
LIST OF REFERENCES


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APPENDIX A
PRE-UNIT INTERVIEW QUESTIONS
Pre-Unit Interview Questions

1. Can you share some of your experience or thoughts that you may have about the particular sport that you will teach? For example, have you taught this content in the past? Did you enjoy teaching it? Where did you learn the sport? Is it valued in this community?

2. How would you describe your knowledge of the target content?

3. What has your experience been with the sport (i.e., as participant, as teacher, as coach)? Has it been positive, negative?

4. What aspect(s) of the game do you enjoy best as a participant, as a teacher, or as a spectator?

5. What content are you going to cover in your classes?

6. What would you like to see happening in your class during this unit?
   -- What is it that you wish to accomplish in this unit?
   -- What would you like your students to know about, appreciate, or be able to perform in the game/classroom (address P/M, social, cognitive outcomes)?

7. Are your expectations for your students any different from other content areas you are teaching? If so, how?

8. Do you remember any kind of difficulties that you had last time you taught the same content to the grade students?

9. What are some concerns (i.e., personal, environmental) that you have or think about that they may impede the accomplishment of your purposes?

10. Tell me a little about your students in this class?
    -- Had you had them before?
    -- How well do you know your students?
    -- Would you characterize them as a difficult group?
APPENDIX B
POST-UNIT INTERVIEW QUESTIONS
Post-Unit Interview Questions

1. Now that the unit is finished, how do you feel about the work accomplished?
   -- Did you meet your objectives in both classes? (Yes, no, and why).
   -- Which performed better and why?
   -- What objectives were fully met and why?
   -- What objectives were partially met and why?
   -- Was there any objective that was not met and why?

2. In your estimation, which part(s) of the lessons and/or the unit went as expected and which one(s) did not?
   -- How was the content development?
   -- What tasks worked well for you and why?
   -- What tasks did not work as well and why?
   -- What were some reasons for the choice of tasks?
     Students
     Equipment
     Time
     Gymnasium/space
     Other

3. If you were to teach the same unit to the same students, would you teach it in the same way, or you would make any changes?
   -- Would you teach the same skills?
   -- Would you teach different skills?
   -- Would you use the same/other drills/tasks?
   -- Would you change the game conditions and how?
APPENDIX C

PRE- AND POST-LESSON INTERVIEW QUESTIONS
Pre- and Post-Lesson Interviews

1. What do/did you expect to accomplish in this lesson?

2. What factors did you consider in selecting and sequencing the particular activities/tasks
   -- Student level of performance
   -- Number of students
   -- Availability of equipment/space/time
   -- Student engagement
   -- Student motivation

3. Did you make any adjustments or changes in your lesson today and why?

4. What tasks/activities worked well today and which ones did not and why?

5. How pleased are you with the students' performance?

6. To what extent did you accomplish what you planned to accomplish?

7. What were the differences and similarities between the two classes?

8. Did you notice/encounter anything in the lesson today that drew your attention?