Examination of Expert and Novice Teachers’ Constructivist-Oriented Teaching Practices Using a Movement Approach to Elementary Physical Education

Weiyun Chen and Inez Rovegno

The purpose of this study was to describe the characteristics of expert and novice teachers’ constructivist-oriented teaching practices while using a movement approach to teach elementary physical education. Three expert and three novice teachers’ constructivist-oriented teaching practices (18 lessons, 3 each) were evaluated using the Educational Games Observation Rubric (EGOR), a rubric specifically designed and validated for this study. Data sources included transcripts of two formal interviews with each teacher, transcripts of the 18 videotaped lessons, and coding from the EGOR. The expert teachers were more likely than the novice teachers to facilitate students’ self-regulation and critical thinking about movement quality, to link new learning to students’ prior knowledge and emerging relevance, and to guide students’ social interaction. As with the expert teachers, the novice teachers encouraged students to engage in, elaborate on, and share ideas about movement variety tasks.

Keywords: constructivism

In general education, there has been an increased interest in using curricular options consistent with constructivist learning theory (e.g., whole language). The general tenets of constructivist learning theory include: (a) individuals actively construct their own meaning; (b) meaning-making takes place as learners attempt to link present with past experiences and knowledge; and (c) although idiosyncratic by nature, meaning-making is socially, culturally, and temporally bound. The origin and development of constructivism owes much to the work of Piaget and Vygotsky (Brooks & Brooks, 1993; Cobb, 1994a, 1994b; Prawat, 1992).

Piaget’s cognitive constructivist perspective stresses the importance of knowledge connectedness in building new learning based on an individual’s previous understanding and personal experiences. Individuals’ prior knowledge and experience shape the way new information is selected and interpreted and affect the way meaning is assigned to new knowledge. From this standpoint, knowledge construction involves activation and re-organization of relevant existing knowledge to make a unique understanding of the world (Brooks & Brooks, 1993; Wood, Cobb, & Yackel, 1991).

Vygotsky’s sociocultural constructivist perspective, in particular, underscores that social interaction and shared discourse promote an individual’s deep understanding of information and making sense of the world (Cobb, 1994a, 1994b; Driver, Asoko, Leach, Mortimer, & Scott, 1994). Sociocultural constructivists, thus, claim that learning is a socially bounded and situated activity that is enhanced in contextualized sociocultural environments. Knowledge is constructed through the interplay between an individual’s knowledge, attitudes, and values and social interactions in a sociocultural context. Children’s daily and school experiences involve social interaction with peers, adults, and a particular disciplinary community in which teachers and children are socialized (Cobb, 1994b; Driver et al., 1994). These social interactions in a given cultural setting, to some extent, shape individuals’ knowl-
edge construction. Theorists and researchers recently have suggested that the cognitive and sociocultural perspectives are not mutually exclusive. Learning involves both the process of individual active knowledge construction and the process of enculturation and social interaction (Cobb, 1994a, 1994b; Driver et al., 1994).

Many educators are attempting to develop instructional approaches and teaching strategies that are reflective of constructivist beliefs about how individuals learn (e.g., Brooks & Brooks, 1993). In general, these approaches and teaching strategies have included: (a) engaging students in exploratory, self-regulated, and cooperative learning activities; (b) inviting students to decide their own learning tasks and objectives, generate questions and answers, express their ideas and thoughts, and seek out their own solutions to the problems; (c) asking thoughtful and open-ended questions to facilitate students’ use of higher-order thinking skills to critically reflect, identify, and evaluate their learning; (d) guiding students to elaborate on their initial thoughts and actions by scaffolding various ways of expanding responses, probing questions, and providing clues; (e) structuring learning experiences around a “big picture” in the context of authentic situations to help students make connections among pieces of information and understand the essence of concepts; (f) organizing learning experiences relevant to students’ prior knowledge and daily lives to help students make learning meaningful to them; and (g) guiding students to work together productively and cooperatively by establishing the ground rules and norms to listen to others respectfully and to share ideas with one another (Brooks & Brooks, 1993; Prawat, 1992; Shapiro, 1994; Wood et al., 1991).

The physical education literature also suggests an increased attention to constructivist learning theory and instructional practices. One strand includes the use of constructivism as a theoretical basis for studies. For example, Pissanos and Allison (1993) examined how students constructed meaning and the factors that influenced the construction of meaning in elementary physical education learning experiences from a constructivist perspective. They found that the students’ constructions were influenced by the teacher’s beliefs about teaching, instructional strategies, and gender. Another strand focuses on exploring the link between constructivist principles and teaching approaches in physical education. Rovegno and Kirk (1995) noted that some constructivist-oriented teaching principles, such as exploratory and discovery learning and problem solving, were incorporated into physical education textbooks in the 1970s. For example, Moston’s (1972) spectrum of teaching styles addressed the gradual shift from teachers making decisions to students taking responsibilities for their learning as the learning progressed and students gained an adequate knowledge base. In addition, since the late 1950s, programs consistent with constructivist perspectives have most often been associated with elementary school physical education and specifically those programs that have been characterized as movement approaches (Barrett, 1997). Further, and within the last decade, movement approaches have received increased attention among physical education teachers and scholars (Ennis, 1991; Ennis, Mueller, & Hooper, 1990; Ennis, Mueller, & Zhu, 1991; Rovegno, 1992a, 1992b, 1993a, 1993b, 1998; Sebran 1995).

Movement approaches define movement as the content of physical education curriculum and use constructivist-oriented teaching principles as instructional foundations (Logsdon et al., 1984; Rovegno, 1993a). There is no one definition, but typically there are similarities across movement approaches in regard to philosophy, definitions of physical education content, and orientations toward instruction. Movement approaches view learners as the center of the teaching-learning process. The constructivist tenet that learners are seen as capable and active creators of their own knowledge is central to most movement approaches. Movement approaches use the ideas of Laban’s movement framework and the American basic, fundamental, and specialized model to organize movement into three content areas: educational games, gymnastics, and dance; a fourth area, aquatics, is also added in some programs (Barrett, 1997). Laban’s movement framework describes movement as four aspects: body, space, effort, and relationships from a conceptual perspective, while the American model identifies fundamental and specialized motor skills as common skills used in games, gymnastics, dance, and aquatics from a skill perspective (Barrett, 1997). Both models provide teachers with the rationale for making decisions about how to organize movement content into a progressive sequence for teaching (Barrett, 1997; Graham, Holt-Hale, & Parker, 1998; Logsdon et al., 1984; Young, Klesius, & Hoffman, 1994). What links these movement approaches to constructivist-oriented teaching is their commitment to such goals as developing learners’ independent learning abilities and fostering ownership of their learning experiences. To accomplish such goals, tenets of constructivism are reflected in the instructional strategies of movement approach lessons. For example, teachers in movement approach lessons typically present content in conceptual clusters relevant to students’ skill levels and prior knowledge; teachers encourage students to actively explore various ways to perform a movement and discover personal meaning; teachers encourage students to share ideas with one another and solve learning problems jointly when working with partners or in groups. In short, constructivism serves as a theoretical basis for instructional methods in movement approach lessons. Accordingly, teaching practices reflected in movement approach lessons are constructivist oriented (Rovegno, 1992a, 1992b, 1993a, 1993b, 1998).

Ennis (1994) conceptualized pedagogical expertise as the synthesis of teachers’ knowledge and beliefs. Teachers’ knowledge of content, students, and teaching deter-
mines how well they can structure their own teaching practices. Teachers' beliefs about teaching, in turn, determine when, why, and how they enact their knowledge in teaching practices. In that sense, teaching practices can be structured from constructivist perspectives. If teachers hold constructivist beliefs, their teaching practices should reflect those beliefs. The research on expertise in teaching, however, has indicated differences in expert and novice teachers' knowledge of content, students' characteristics, classroom routines, interpretation of classroom events, and decision making. Researchers report that expert teachers' knowledge of subject matter, students, and classroom events was more elaborated and interconnected than novice teachers' knowledge (Rink, French, Lee, Solmon, & Lynn, 1994; Swanson, O'Connor, & Cooney, 1990; Tan, 1996). Expert teachers tended to use their richer knowledge of content, children, and teaching to provide more meaningful interpretations of the class events than novice teachers (Carter, Cushing, Sabers, Stein, & Berliner, 1988; Needels, 1991; Sabers, Cushing, & Berliner, 1991). Expert teachers also exhibited a greater ability to attend and respond to multidimensional and simultaneous class activities than did novice teachers (Berliner, 1986; Carter et al., 1988; Sabers et al., 1991).

In interactive teaching decisions, expert teachers tended to make situational decisions appropriately based on children's responses to learning tasks and adjusted their lesson plans if necessary (Borko & Livingston, 1989). In contrast, novice teachers were more likely to stick to their lesson plans and provide preplanned feedback regardless of what was happening in the classroom (Borko & Livingston, 1989; Schempp, Mauritss, Tan, & Fincher, 1998; Tan, 1996). When planning physical education lessons, expert teachers were more likely than novice teachers to consider information about facilities and students' movement experiences and motor skill abilities (Byra & Sherman, 1993; Griffl & Housner, 1991; Solmon & Lee, 1991). With respect to reflecting on their teaching, expert teachers in general focused more on how to facilitate students' active roles in identifying and solving problems, whereas novice teachers were more concerned about specific classroom events, such as the use of examples, the chalkboard, and responses to students' questions (Borko & Livingston, 1989).

Research on expertise in teaching has focused little attention to the differences between expert and novice teachers' constructivist-oriented teaching practices. The purpose of this study was to describe the characteristics of 3 expert and 3 novice teachers' constructivist-oriented teaching practices while using a movement approach to teaching elementary school physical education. Specifically, attention was paid to expert and novice teachers' abilities to: (a) guide and facilitate students' active and self-regulated construction of knowledge, (b) help students build bridges between acquisition and application of knowledge, and (c) facilitate students' social construction of knowledge. This study is significant in that it begins to document the characteristics of experts' and novices' constructivist-oriented practices in physical education within the specialized context of selected movement approaches that heretofore have not been possible, as the tools for such study were not available. Moreover, it may help us gain insight into those aspects of constructivist-oriented physical education practices that are less or more difficult for novice teachers to learn.

**Methods**

**Participants**

The participants in this study were 3 expert and 3 novice teachers. All teachers signed consent forms for videotaping their lessons and conducting interviews. The expert teachers were from Florida and had been nominated to participate in this study by two university faculty familiar with their programs, teaching practices, and professional contributions. All the teachers had (a) used constructivist-oriented movement approaches to teaching elementary physical education for more than 5 years, (b) published either lesson plan books or articles in professional journals, (c) designed the curriculum guides for their districts, and (d) presented workshops at state and regional conventions.

Helene Hughes and Rosie Allison graduated from University of South Florida, which has a teacher education program known for teaching a movement approach (Rovegno, 1993a, 1993b). These two expert teachers had used the *Meaningful Movement for Children: A Developmental Theme Approach to Physical Education* (Hoffman, Young, & Klesius, 1981) in teaching physical education for 11 and 6 years, respectively. The third teacher, Dianna Bandhauer, has used the *Every Child a Winner* movement approach (Rookett & Owens, 1977) in teaching physical education for 15 years and learned this movement approach through experimenting with what she had learned from in-service workshops, conference sessions, and reading the literature (Rovegno, 1997, 1998). The expert teachers' real names are used with their permission as a means of verifying the trustworthiness of their expert status.

The 3 novice teachers were student teachers who attended a major university other than the University of South Florida in the southeastern district. Their elementary methods teacher educators evaluated them as competent students based on their ability to use Laban's movement framework to design varied and progressive learning tasks and use some teaching strategies compatible with constructivist perspectives of teaching. The student teachers, Jim Clapp, John Wright, and Sherry Lee (pseudonyms), were taught a constructivist-oriented movement approach by the same teacher educator dur-
ing their six-credit elementary curriculum and practicum courses. The courses focused on teaching diagnostic problem-solving, and cooperative learning experiences within the context of educational games, dance, and gymnastics. They were also taught to use constructivist-oriented teaching strategies to help children achieve educational objectives through learning movement content. The courses primarily used Graham, Holt-Hale, and Parker’s (1993) skill theme approach. Suppemental textbooks included Physical Education Teaching Units for Program Development Grades 4–6 (Logsdon, Alleman, Clark, & Sakola, 1994) and Teaching Children Dance: Becoming a Master Teacher (Purcell, 1994). These three novice teachers had not studied the Every Child a Winner and Meaningful Movement curriculums and had no connections with the expert teachers in this study.

Teaching Approaches

Despite the fact that the participants used different movement approaches to teaching games, all three approaches—a meaningful movement approach (Hoffman et al., 1981; Young et al., 1994), every child a winner approach (Rockett & Owens, 1977), and a skill theme approach (Graham, Holt-Hale, & Parker, 1993, 1998)—can be identified as movement approaches (Barrett, 1995; Rovegno, 1993a, 1993b, 1998). All adapt Laban’s movement framework or the American basic, fundamental, and specialized model to identify movement within the three movement forms of educational games, gymnastics, and dance. For example, the Meaningful Movement approach (Hoffman et al., 1981; Young et al., 1994) uses Laban’s framework to organize movement content into six broad themes: “becoming aware, becoming independent, accepting and expressing feelings and ideas, accepting responsibilities and acting cooperatively, improving quality of response, and drawing relationships” (Young et al., 1994, p. 17). A central goal to this approach is to help students make learning meaningful to them, which reflects a tenet of constructivism. In the Every Child a Winner approach (Rockett & Owens, 1977), learning experiences are structured around the body, space, effort, and relationship aspects of Laban’s framework and then organized into sequential progressions. The philosophy of this movement approach, that is, developing children’s creative and cooperative abilities and problem-solving skills, embraces constructivist perspectives of learning. The skill theme approach (Graham et al., 1998) organizes content into movement concepts and skill themes by combining the American model and Laban’s movement framework. The commitment to developing children’s various movement responses through engaging in exploratory experiences and helping children gain a functional understanding of movement concepts in authentic movement situations highlights constructivist foundations of this approach.

Development of the Educational Games Observation Rubric (EGOR)

Assumptions and Purpose. The EGOR was designed as an observational rubric to assess the extent to which a teacher’s practices were associated with expertise in teaching educational games. A rubric is a scoring tool for assessing performance within gradations in a specific context domain (Goodrich, 1997; Schiener, 1999). It consists of three components: (a) essential dimensions-trait identification adequate categories and subcategories underlying the theoretical construct of an assessment tool, (b) a rating scale that labels performance levels within progressions of quality from excellent to poor, and (c) performance criteria-descriptors that describe various degrees of the characteristics of performance levels. The theoretical construct of the EGOR was constructivist perspectives of learning and expertise in teaching educational game lessons. Accordingly, the items in the rubric were constructed to describe the integration of constructivist-oriented practices and expertise in teaching educational game lessons.

Category Development. The EGOR was developed by the authors based on the Science Classroom Observation Rubric designed by Burry-Stock and Oxford (1994). Because there is no such instrument available in our field, several iterative steps were used in developing the items on the EGOR.

First, a review of over 100 references helped the authors identify three major dimensions of constructivist-oriented teaching: (a) facilitating students’ active construction of knowledge, (b) activating students’ prior knowledge and emerging relevance, and (c) facilitating students’ social construction of knowledge through social interaction. The three dimensions served as the theoretical framework for developing the categories on the EGOR.

Next, to test whether the items on the EGOR can be used to measure expertise levels in teaching educational games from constructivist perspectives adequately and precisely, the first author conducted a pilot study with the first version of the 19-item EGOR to assess seven videotaped lessons taught by Dianna and seven videotaped lessons taught by 3 other novice teachers who did not participate in this study. The taped lessons taught by Dianna were different from those used in this study. After evaluating all taped lessons, the first author looked through each coding sheet and then decided (a) which items appropriately reflected teachers’ teaching practices, (b) which items needed to be revised and modified, and (c) which salient aspects of teachers’ teaching practices were not included in the items on the EGOR. Accordingly, the two authors revised and rewrote the definitions of the items on the EGOR numerously throughout the study.

The final version of the EGOR consists of 10 constructivist-oriented teaching practices organized into three categories, each representing a major dimension of constructivist teaching. A frequency 5-point rating scale
identifies a gradation of expertise levels in each of the teaching practices on the EGOR (see Table 1). For example, a rating of "5" indicated that almost all tasks or statements presented by a teacher or his or her responses were evidence of the definition; "3" indicated that about half of the tasks or statements presented by a teacher or his or her responses exhibited characteristics of the criteria descriptors on the EGOR; "1" indicated no evidence of using a constructivist-oriented teaching practice. In addition, "N/A" was used if a teaching practice was not applicable to a lesson. The final version of the EGOR was used to evaluate the 18 taped lessons for this study.

Reliability and Validity. The internal consistency of the 10-item EGOR was determined by means of Cronbach’s alpha reliability (r = .88) and item-to-total correlation (r = .42–.86) on the data from 18 videotaped lessons taught by 3 expert and 3 novice teachers. The results suggested that the reliability of the EGOR was relatively high, meaning that the EGOR could provide consistent and reliable data for this study. A Mann-Whitney U test was conducted on the data from 18 videotaped lessons to test the construct-related validity of the EGOR. The analysis indicated a significant difference between the expert and novice groups (Z = 9.9, p = .05), which contributed to the construct-related validity of the rubric. This indicated that the EGOR can be used to measure what we purported to measure and to differentiate expertise levels between the two groups' teaching practices from constructivist perspectives.

Data Collection

Videotaping Lessons. To provide data sources for examining characteristics of the experts’ and novices’ teaching practices, the first author videotaped each teacher teaching a self-designed educational games unit of three progressive dribbling lessons to third grade students on sequential days for a total of 18 dribbling lessons. Dribbling lessons were chosen because dribbling is an important elementary content and included in the three approaches used by the participants. Two video cameras were used for videotaping. The teacher was in camera range at all times, as were most of the children. All teachers wore a wireless microphone attached to the video camera to record their verbal interactions with the children. All videotaping began when the teacher started the dribbling lesson and continued until the teacher dismissed the class.

Inter- and Intraobserver Agreement of Coding the Taped Lessons. Prior to data collection, the investigators developed and studied the Manual for Scoring the EGOR, which included the training process, coding protocol, evaluating manual (EGOR), and EGOR coding sheet. We checked the interobserver agreement item by item using the formula: % R = n agreement/(n agreement + n disagreement) x 100 (Van der Mars, 1989). We followed the coding protocol described in the next section to code the “reliability taped lesson” (not the dribbling lessons in this study) independently. Subsequently, we recorded the same lesson independently after 7 days until reaching over 80% interobserver agreement. After each practice, the authors discussed each other’s coding until reaching 100% interobserver agreement.

In addition, the first author also checked intraobserver agreement (90%) for coding and recording the “reliability taped lesson” prior to actual coding. During coding of the dribbling lessons, the first author recorded the “reliability taped lesson” after coding every six dribbling lessons. The intraobserver agreement reached 100%. After coding the dribbling lessons, the first author coded three randomly selected dribbling lessons, and the intraobserver agreement ranged from 81 to 90%.

Procedures for Evaluating the Taped Lessons. To ensure objective and consistent evaluation of the taped lessons, the first author used the following procedures to prepare the data for formal coding: (a) each lesson was transcribed and read through twice; (b) each lesson transcript was organized into three phases—lesson introduction, task presentations, and responding to learning—through reviewing the transcripts and using the phases to label the relevant information on each transcript; (c) the items on the EGOR were reorganized to the three phases on the transcripts; and (d) the reorganized items on the EGOR were pasted in the margin of the transcript next to the information identified as the same phase.

After this preparation phase, the first author coded and evaluated the 18 lessons using the following coding protocol: A coder viewed the taped lesson along with the lesson transcript and encoded whether the teacher’s behaviors, as identified on the EGOR, were present (code yes), not present (code no), or not relevant (code N/A) for each phase. After each lesson was coded, the total number of “codes with frequencies” was entered on the EGOR coding sheet to provide the quantitative data for quantifying a teacher’s teaching practices. Finally, a coder rated each of the teaching practices based on frequencies on the EGOR coding sheet using the EGOR rating scale (see Table 1). For example, with respect to Item 1 on the EGOR, if a teacher presented 10 tasks, and 8 or more tasks (coded “yes” on the EGOR coding sheet) showed evidence of the definition described on the EGOR, a teacher’s first teaching practice would be rated as 5, based on the rating scale on the EGOR. If six to seven tasks (coded “yes” on the EGOR coding sheet) demonstrated evidence of the definition described on the EGOR, a teacher’s first teaching practice would be rated as 4, and so on. The number of N/A was not counted as a total number of task presentation, lesson introduction, or response to learning.

Interviews. Patton’s (1990) interview guide approach was used to conduct two formal interviews with each participant. The first focused on gathering information about the teachers’ teaching background, beliefs about teaching and learning, and their teaching practices. The purpose of the second interview was to gain insight into the
teachers' perspectives on the three major ideas reflected in the EGOR: (a) how they provided students with opportunities for being responsible for their own learning and why, (b) how they built new learning experiences on students' prior or present knowledge and skill levels and why, and (c) how they guided students to interact cooperatively with each other and why. Probes were used to extend and clarify their responses if necessary. Each interview, which

<table>
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<tr>
<th>Table 1. Educational games observational rubric (EGOR)</th>
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<td>Rating scale: 5—almost all tasks, statements, or teachers' responses show evidence of the definition; 4—over half of tasks, statements, or teachers' responses show evidence of the definition; 3—about half of tasks, statements, or teachers' responses show evidence of the definition; 2—less than half of tasks, statements, or teachers' responses show evidence of the definition; and 1—none of tasks, statements, or teachers' responses show evidence of the definition.</td>
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Category I: Engaging students in active and self-regulated construction of knowledge

A. Facilitating students' active engagement
   When children are learning a skill or game play content, the teacher encourages students to apply knowledge of movement to extend their use of a skill in relation to relevant movement concepts or gamelike situations or design or modify games to work on a specific skill or strategy.

B. Facilitating students' elaboration of ideas about movement variety
   When students' initial responses to extending the use of a skill or designing games are restricted, the teacher engages students in elaborating on their initial ideas by giving suggestions, asking thoughtful questions, or scaffolding multiple ways of elaboration to help students to think broadly and comprehensively.

C. Facilitating students' self-regulation of movement quality
   When children are learning a skill or game play, the teacher encourages children to be self-regulated in their use of learning cues or key learning criteria to refine and assess movement quality or in their use of game rules and game strategies to improve their application of motor skills.

D. Facilitating students' self-responsibility
   During learning, students are encouraged to be responsible for their own learning experiences. The teacher facilitates their learning process.

E. Facilitating students' critical thinking about movement quality
   When students cannot perform a skill or play a game efficiently, the teacher guides students to identify problems and successes or think critically about how to perform a skill or play the game efficiently.

Category II: Activating students' prior knowledge and emerging relevance

F. Use of metaphors, examples, and images
   When presenting new learning tasks or learning cues, the teacher uses appropriate, interesting, and captivating metaphors, or images relevant to students' real-world experiences and levels of cognitive understanding.

G. Connecting to students' prior knowledge and experiences
   When presenting new learning tasks, the teacher asks the students questions to help them link the new learning task to what they already learned during the lesson or unit.

Category III: Facilitating students' social interaction among groups and joint problem-solving settings

H. Guiding students to share ideas about movement variety
   When working on movement variety in groups or with partners, the children are encouraged to share or discuss their ideas about exploring various ways to perform a skill.

I. Guiding students' discussions about movement quality
   When working on movement quality in groups or with partners, children are encouraged to communicate their ideas about how to perform a skill successfully and efficiently.

J. Facilitating partner or group work
   Whenever students have problems working productively with a partner or group member, the teacher guides them in thinking about how to work together productively and cooperatively.
was tape-recorded and transcribed for analysis, was 45 min in length, on average.

Data Analysis

The complete data set for this study included: (a) quantitative analysis of data obtained from evaluating the 18 videotaped lessons with the EGOR, (b) qualitative analysis of the 18 lesson transcripts, and (c) qualitative analysis of the interview transcripts.

Quantitative Data From the Videotaped Lessons. Because the sample size of three lessons per participant was small, descriptive statistics were used to analyze each of the 10 constructivist-oriented teaching practices for the expert and the novice groups. Accordingly, reported are the means, standard deviations, and frequencies of scores of the experts' and the novices' teaching, rated on a 5-point rating scale with the EGOR.

Lesson and Interview Transcripts. In this study, the lesson transcripts served as not only a complementary tool to code the taped lessons with the EGOR but also a qualitative data source to provide instances for the descriptive data. In that sense, the purpose of qualitatively analyzing the lesson transcripts is different from coding and evaluating the 18 lessons with the EGOR, although the lesson transcripts were used for the coding. To analyze the qualitative data from the lesson and the interview transcripts, the techniques suggested by Glaser and Strauss (1967) and Goetz and LeCompte (1984) were used. The first author read and re-read the lesson and the interview transcripts, highlighted instances of the teachers' constructivist-oriented teaching practices, and identified negative instances of the teachers' constructivist-oriented teaching practices (e.g., introducing new content without making a linkage between new learning tasks and students' prior knowledge). To provide the descriptive data of the tasks designed by the teacher, the types of learning tasks across lessons (e.g., individual tasks or partner-group tasks) were identified and counted. According to the instances identified and what emerged from data analysis described above, the first author combined similar instances into categories, then compared and contrasted the categories to those on the EGOR to check whether the emerging categories from qualitative data analysis were consistent or different from the predetermined categories on the EGOR. Next, the first author grouped the emerging categories into themes and eliminated nonrelevant properties and infrequent incidents. The second author reviewed all qualitative coding to confirm or disconfirm the coding.

Results and Discussion

For discussion of the experts' and novices' teaching practices, the results are organized into three categories reflecting the structure of the EGOR: (a) engaging students in active and self-regulated construction of knowledge, (b) activating students' prior knowledge and emerging relevance, and (c) facilitating students' social cooperation. In each category, we begin with an assertion that summarizes the salient theme of the results and follow with a brief description of the constructivist-oriented teaching practice in question. Next, we describe the similar characteristics of the teachers' and the novices' teaching practices, their perceptions of constructivist-oriented teaching practices, and the different characteristics of their teaching practices, with providing documentation from the lesson transcripts, EGOR results (see Table 2), and interview transcripts. We conclude each section with a discussion.

Characteristics of Experts' and Novices' Teaching in Engaging Students in Active and Self-Regulated Construction of Knowledge

Assertion 1. The expert teachers' teaching practices went beyond engaging students in only exploratory activities. They facilitated and mediated students' self-regulation of and critical thinking about the quality of a skill and tactical performance. In contrast, the novice teachers equated exploratory activities with active construction of learning.

Constructivist-oriented teaching is designed to foster students' responsibility for their own learning by engaging them in discovery and self-regulated activities. Discovery and exploratory activities involve students in applying their knowledge to create a variety of responses and initiate new ideas. Self-regulated activities applied in physical education involve encouraging students to self-monitor and self-evaluate their movement quality, given key criteria or learning cues (Brooks & Brooks, 1993; Pravat, 1992; Rovegno, 1992a, 1993b).

Engaging and Elaborating on Exploratory Activities. In this study, both expert and novice teachers encouraged students to actively discover and explore activities and helped them expand on their initial ideas about movement variety tasks. The lesson transcripts indicated that both the expert and novice teachers encouraged students to actively explore dribbling at different levels, with different speeds, in different directions, and on different pathways. In addition, both asked students to follow the leader while dribbling in different ways. The expert teachers encouraged students to design their own obstacle courses, games, game rules, and tactics. None of the novices included child-designed obstacle courses and games. The lesson transcripts also indicated that when responding to students' learning movement variety tasks, both the experts and novices tended to ask questions, demonstrate, and make suggestions to help students elaborate on their initial ideas. For example, when asking students to design their own obstacle course, Dianna suggested, "You know what I thought you would do? [one child responded] That's a good one.
What is another way you could do it? We have more crates. You can stack them higher.” Similarly, Jim (a novice) responded to students: “Put your ball into different body positions. We have done one knee down. What about putting your two knees down and one hand down? There you go.”

Using the EGOR at a 5-point level to evaluate the taped lessons supported the findings described above. With regard to Teaching Practice A (facilitating students’ active engagement), the expert teachers across the nine lessons almost always encouraged students to actively engage in exploratory and discovery activities. On five occasions, the novice teachers were coded as almost always implementing constructivist-oriented teaching practices, while in three lessons the practice was seldom used. Taken together, no major differences were found in this practice between the expert and novice groups. For Teaching Practice B (facilitating students’ elaboration on ideas about movement variety), both the experts and novices tended to guide students to elaborate on their initial ideas.

Perceptions of Active Construction of Knowledge: The results from the interviews indicated that the expert teachers had different perceptions of constructivist-oriented teaching practices from the novice teachers. The expert teachers perceived a constructivist-oriented approach as going beyond engaging students in exploratory activities. For example, Rosie stated:

They learn so much better when they create it by themselves, because they have to go through the process of how to modify this game. By going through the process of how to modify their own games, they are actually thinking more about the skills they are learning.

Similarly, Helene said, “They will be able to understand the importance about thinking about what they are doing, and they will be able to say that this ball is away from him, too high for him to control it.” They articulated that encouraging students to be responsible for their learning included not only having the students explore divergent movement responses but also guiding students to self-regu-

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<td>Active engagement (A)</td>
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<td>Elaboration of ideas about movement variety (B)</td>
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late their movement quality by engaging thinking processes. In contrast, the novice teachers in this study perceived encouraging students' self-responsibility for learning as simply having them engage in exploratory activities. For example, John said:

I let them think for themselves. We traveled with different speeds; we traveled on different pathways and at different levels, I said, "I want you to travel on different pathways and at different levels. I am not going to tell you which one you are going to travel on. I want you to travel on by yourself," and they did that.

Likewise, Jim said, "I had them explore different ways they could dribble the ball around different parts of the body." The novice teachers' perceptions of a constructivist-oriented approach were superficial and fragmented.

Engaging Self-Regulation of and Critical Thinking About Movement Quality. The results revealed differences between the experts and the novices in engaging students in self-regulation and think critically about movement quality. The lesson transcripts indicated that when presenting exploratory and problem solving learning tasks to children, the expert teachers were more likely to involve the students in thinking processes to self-regulate the quality of their dribbling movement. For example, Rosie told her students, "I am going to see if you concentrate on the four precision points of the dribbling." Helene said, "I am going to see if you think about how high and how hard." In addition, when responding to students' working on movement quality, the expert teachers were more likely to engage them in identifying their problems and thinking critically about what they were doing. For instance, the expert teachers posed problems relevant to the students' previous response. Dianna said, "We have worked on thinking about what happened in the game. In this activity we missed something. What's missing?" Like Dianna, Helene guided the students to think critically about dribbling a ball effectively within a game context.

How many of you watched a basketball game lately? Do those basketball players move fast or slow? Do they move to an empty space? What did they do? What did you see them doing? What else are they thinking about? What other choices do they have?

In contrast, the novices' teaching practices were characterized by a lack of attempt to engage students in thinking processes; rather, they reminded students of learning cues, such as: "Remember, keep your eyes up and use your finger pads," and "Bend your knees and bend your back a little bit." Additionally, when responding to students' movement quality, the novices did not ask students to identify their own problems or think critically about how to dribble the ball efficiently; they told them directly what to do. For example, Jay responded to his students, "Some of you slap the ball. Don't slap the ball. Push the ball. Use your finger pads to push it down."

Similarly, differences were noticed on evaluating the taped lessons for Teaching Practice C, D, and E, respectively. With respect to Teaching Practice C (facilitating students' self-regulation of movement quality) the experts were more likely than the novices to encourage students to be self-regulated in using game rules and tactics or key learning criteria to refine and self-monitor the quality of a skill or effectiveness of a game tactic. Similarly, for Teaching Practice D (facilitating students' self-responsibility) the experts were more likely than the novices to encourage their students to be responsible for their own learning experiences. For Teaching Practice E (facilitating students' critical thinking about movement quality) the expert teachers consistently guided students to identify their movement problems and successes and think critically about how to perform a skill efficiently or play a game strategically, while the novice teachers seldom or never used this constructivist-oriented teaching practice.

Factors Contributing to Different Teaching Practices. One factor contributing to the differences in teaching practices between the experts and novices might be the teachers' perceptions of constructivist-oriented teaching. The results indicated that the expert teachers' perceptions of a constructivist-oriented approach were deeper and more holistic. This result is consistent with Rovegno's study (1998), which investigated how teachers learn a constructivist approach. She found that teachers came to realize their roles included far more than providing students with opportunities to explore alternative movement responses and design movement sequences. Teachers needed to guide students' learning by constraining tasks to refine movement quality and generating questions to identify, analyze, and critique movement problems. The teachers learned to focus students' attention on different movement concepts within an activity.

In contrast, the novices in this study held naive constructivist views that equated exploratory activities with active construction of learning (Prawat, 1992). This corroborates DeRuiters's (1991) and Rovegno's works (1992a, 1993b, 1998), who found that beginning constructivist teachers tended to overgeneralize the contrast between a constructivist and traditional approach; these teachers thought that presenting exploratory activities was all that they needed to do to teach a constructivist approach; they initially thought that if they mediated students' learning, they would violate the constructivist approach. As a result, the preservice teachers tended to "leave students on their own" after they presented a learning task (DeRuiters, 1991, p. 11). "Hands-on" learning, however, does not mean "hands-off" by the teacher (Rovegno, 1998).
Another factor influencing differences in teaching practices between experts and novices might be the teachers’ abilities to make situational decisions based on students’ responses. Studies on expertise in teaching found that the expert teachers demonstrated a greater ability than novice teachers did to generate questions, pose problems, and provide perceptual cues relevant to how students responded to the content (Borko & Livingston, 1989; Byra & Sherman, 1993; Tan, 1996). The experts in this study might have been able to attend to multidimensional, simultaneous, and intertwined class activities. In other words, the expert teachers not only engaged students in exploratory and elaborate learning activities but also facilitated and guided students’ self-regulation and critical thinking about the quality of a skill or tactical performance. In contrast, novice teachers tended to stick to their preplanned learning cues to respond to students’ learning (Borko & Livingston, 1989; Byra & Sherman, 1993; Tan, 1996). Likewise, Rovegno (1991) found that novice teachers were initially “going through the motions” of teaching, that is, presenting the learning task, providing predetermined learning cues, and moving to the next task without attending to students’ ongoing responses to tasks. Further, Rovegno (1992a) noted that novices discussed problems attending to multiple dimensions of the movement approach such as presenting movement variety tasks and refining the quality of movement. It is possible that the novice teachers in this study had difficulty attending to multidimensional activities simultaneously. This, in turn, might have contributed to their teaching practices being weaker, compared to the expert teachers.

**Characteristics of Experts’ and Novices’ Teaching in Activating Students’ Prior Knowledge and Emerging Relevance**

Assertion 2. The expert teachers used metaphors, examples, or images to introduce new content to students; they asked questions that were related to students’ life experiences to make linkage between students’ prior knowledge and new information. In contrast, the novice teachers never used metaphors, examples, or images but asked questions specifically related to the task to introduce new content.

Brooks and Brooks (1993) noted that engaging students in a task that sparked their interests and desires to accomplish it activated their emerging relevance. Ennis (1994) argued that curricular expertise, from a constructivist perspective, involved creating a learning environment in which students’ prior knowledge was activated to facilitate learning new subject matter. Learning starts with learners. Establishing this connectedness promotes students’ knowledge acquisition and application (Brooks & Brooks, 1993; Cobb, 1994a, 1994b, Prawat, 1992).

**Perceptions of Making Connections.** The results from the interviews indicated that experts had a better understanding of the importance of using metaphors or examples to help children make connections between lesson content and their life experiences than the novice teachers did. When asked to reflect on how to help students understand new content, the expert teachers talked about making connections between students’ authentic experiences and new learning. For example, Rosie said, “I am just doing what I think they could understand... I obviously don’t talk about snow very much. They don’t have any experience. So, I try to relate it to their experiences or life.” Similarly, Dianna talked about how she introduced new content by asking questions related to children’s prior knowledge, “At the beginning, I talked about Michael Jordan and you are the coaches and you tell me what you will see, what he is doing, and what he would be good at.” The way she introduced the content helped the children use their prior knowledge to review the key points for dribbling.

In contrast, the novice teachers said nothing about the importance of building learning experiences on students’ prior or present knowledge. Instead, they talked about how to use demonstrations with explanations to help the students understand new learning content. For example, John said, “I always give a demonstration to them, and when you give them a good demonstration, you don’t have a lot of questions as far as children are concerned.”

**Using Metaphors, Examples, or Images to Connect to Students’ Prior Knowledge.** The results from the lesson transcripts revealed differences between the experts and novices in using metaphors, examples, or images and connecting them to students’ prior knowledge. The expert teachers tended to introduce new content by using metaphors, examples, or images. Dianna, for example, used images to elicit the children’s prior knowledge of dribbling learning cues:

Let’s pretend you are an assistant coach for the Orlando Magic. You fly to Chicago and watch Michael Jordan dribble the ball and you bring back all his secrets for Orlando. Let’s pretend you came back and you are going to tell me. I am a head coach. You are going to tell me what you discovered....

She presented the children with authentic learning environment to help them effectively understand the learning task. The expert teachers also tended to ask students questions relevant to what they had learned in previous lessons or units. For example, Rosie first presented students with a familiar situation and then asked questions related to what they had learned: “We did pathways back when we did creative dance (last unit). Stop and think what we did in creative dance. Who can tell me one of three pathways my body can travel on?” She integrated the content of dribbling on different pathways with what the students had learned before.

In contrast, the novice teachers never used metaphors, examples, or images to introduce new content throughout the nine lessons, tendering instead to draw stu-
students' attention directly to what they were going to do. For example, John typically introduced the content like this: “Who can tell what different levels we can dribble at? What are different levels we can dribble at? What’s another one? Do you have another one?” When introducing new content, the novice teachers asked questions directly about what movement concepts meant but “did not place this concept in a situation with which the students were familiar.” John asked questions such as, “Who can name one pathway for me…Who can name another one?”

Evaluation of the taped lessons also revealed the differences between the expert and novice groups in Teaching Practices F and G (use of metaphors, examples, or images, and connecting students’ prior knowledge and experience, respectively). With respect to the Teaching Practice F, expert teachers were more likely to use metaphors, examples, or images to introduce new content. Likewise, with regard to Teaching Practice G, experts asked questions to help students link the new learning content to what they had learned previously during the lesson or unit. In contrast, in only four lessons were the novice teachers coded as almost always demonstrating this constructivist-oriented teaching practice, and in one lesson the practice was sometimes enacted.

Factors Contributing to Different Teaching Practices. One factor possibly contributing to the differences between experts and novices in these teaching practices might be that the expert teachers had a better understanding of the importance of connecting students’ prior knowledge to new learning. The expert teachers in this study believed that using metaphors or examples helped children make connections between new content and their life experiences and prior knowledge. In contrast, the novice teachers in this study seemed not to understand such importance. Different levels of understanding might influence teaching actions.

Another factor possibly contributing to the differences between the experts and the novices might be their knowledge of students and subject matter. Teachers’ abilities to use metaphors, examples, or images and connect to students’ prior knowledge reflect the intersection of teachers’ knowledge about the subject matter and children (Brooks & Brooks, 1993; Shapiro, 1994). Teachers’ understanding of how children learn and respond influences the way they transform knowledge into teachable content (Shulman, 1987). Likewise, without an understanding of how children learn and think and how they react to the content being taught, teachers will have difficulty presenting a concept in such a way that it links children’s relevant experiences and vocabularies to their levels of understanding (Rovegno, 1998). Research on expertise in teaching suggests that expert teachers’ knowledge of content, children, and teaching is more complex, differentiated, and relational and organized in more meaningful and holistic ways than novice teachers (Ennis et al., 1991). These characteristics help experts to capture the essence of the content and translate it into meaningful connections between new information and learners’ prior knowledge (Borko & Livingston, 1989; Ennis et al., 1991; Swanson et al., 1990). Moreover, expert teachers have richer schemata of students (Carter et al., 1988), while novices have reported problems knowing how children learn and respond to lesson content (Grossman & Richert, 1988; Rovegno, 1991, 1992a, 1993b).

In this study, the expert teachers’ intensive and varied teaching experiences were conducive to acquiring extensive knowledge of the children, content, and teaching, which helped them integrate students’ prior knowledge with new information. They had taught the same content repeatedly and knew their children. They could better anticipate how children would respond to the content, and they knew what children had learned in the past. Consequently, the expert teachers had more information about how to help children see the meaning and relevance of content and build a bridge linking new information to what was familiar to the children. In contrast, the novice teachers were new to the setting and had been teaching the content to the children for a short time. Their limited teaching experiences and knowledge of children and subject matter most likely contributed to the difficulty they had facilitating students’ emerging relevance and connecting to their prior knowledge.

Characteristics of Experts’ and Novices’ Teaching in Facilitating Students’ Social Cooperation

Assertion 3. When students were working with their partners or in groups, the expert teachers were more likely to ask students to share their ideas about how to perform a skill or play a game efficiently and successfully and how to expand ideas of movement variety learning tasks. In contrast, the novice teachers tended to encourage students to share ideas about the movement variety learning task by showing their movement responses to their partner but did not guide students to communicate their ideas about movement quality.

Sociocultural constructivists assert that knowledge is constructed in social contexts. Social interaction serves as a catalyst for an individual’s intellectual development (Gobh, 1994a, 1994b). From this perspective, teachers, as facilitators, are challenged to guide students to learn how to work with peers, consider others’ needs, be sensitive to others’ feelings, express their own ideas and reasons, and discuss questions with others cooperatively.

Guiding Students to Share Ideas About Movement Variety Tasks. When students work together in movement variety tasks, both the experts and novices urged them to share ideas about movement variety tasks. The expert teachers encouraged students to communicate their ideas about exploring different ways to dribble and create their own games or obstacle courses to work on dribbling. For example, when asking the children to design their own obstacle course, Dianna asked questions to help them
share ideas about exploring multiple ways of using the equipment.

You look over the equipment. What would be used to go under? [Jay, what could you get to go under over there? ["Basketball hoops," he answered.] All right, we can go under the basketball hoop. What else? [One student asked this idea.] Yes. You can set them on the crate to go under the hula hoop. . . . What could you get to go on? [One student expressed this idea.] All right, you could walk across the crates [repeating the child's answer]. What else could you do?

Across the nine lessons, the novice teachers gave only five tasks in which children worked in groups. For three tasks, the novices asked the children to "follow the leader." They encouraged children to share different ways of dribbling with their partners. For example, Jay presented the learning task like this: "He is the leader. He is going to dribble on any pathways he wants to do, with any hand, or he can alternate. The follower has to do exactly what the leader does." When doing the "follow the leader" task, the children shared their ideas about the movement variety task by sharing their movement responses. The novices never asked the children to discuss their ideas with each other or with the whole class. In short, both the experts and the novices encouraged students to share ideas about movement variety tasks, but they used different ways to do so. Evaluation of the taped lessons revealed no major difference between two groups in Teaching Practice H (guiding students to share ideas about movement variety). As shown in Table 2, the results indicated that both experts and novices urged the students to share ideas about exploring movement variety tasks, although they used different ways to do so.

Perceptions of Guiding Students to Interact With Each Other:
The results from the interviews indicated that the expert teachers' perceptions of social interaction were broader than the novices' perceptions. The expert teachers talked about how they provided the children with different opportunities to interact. For example, Rosie said:

They have lots of opportunities to interact with each other. . . . They go into the pair teaching. So they have to do the reciprocal teaching and help one another to develop each other's skills. Then they go into the competitive situation, where they are interacting, because they have to come up with their game rules and initiate the game.

The expert teachers viewed social interaction as guiding students to share ideas about coaching each other's skills and solving problems. The expert teachers believed that to help children work together productively and cooperatively, it was important to establish norms and rules for group work. For example, Rosie explained her rule for partner work was that children should provide specific feedback for their partner in positive ways. Dianna said two of the rules were that every child should contribute his or her ideas to the group and everyone should listen to the person speaking.

In contrast, the novice teachers' perceptions of social interactions were limited to providing the children with a partner work situation instead of focusing on helping them learn how to share ideas cooperatively. For example, Sherry said, "Actually, the second lesson we did 'follow the leader.' We've done a lot of partner things, like mirroring, matching, contrasting different things." Similarly, Jay said, "We did a drill called 'follow the leader.' We did that to get them to work together." They did not talk about how to guide the students to work together. Unlike the expert teachers, novices did not establish specific rules to help the children work together productively. When the children could not work together cooperatively, the novice teachers said that they had the children switch to a different group or sit out. The novice teachers did not teach the children how to work together.

Guiding Students' Discussions About Movement Quality and Facilitating Partner or Group Work: The lesson transcripts indicated that expert teachers invited the children to share ideas about how to perform a skill successfully or play a game tactically, such as how to keep an opponent from stealing the ball, control the ball successfully, and push the offense to the corner. For example, Rosie invited the children to discuss a dribbling the ball successfully in a game situation:

Can anyone tell me what I have to do to keep him from getting my ball? Steve, yes. Steve said I should put my back toward him. If I can keep my body between him and my ball, he is not able to get it, is he?

The expert teachers also helped students learn to work together productively and cooperatively. For example, when students had problems playing games productively, Dianna guided them in solving their problems to play their games productively. She asked questions such as:

Now, something happened you did not plan for. What was it? He fouls you. So, we have to make rules about our personal space. What should they be? What do you have? Who is going to call a foul?

Conversely, the novices simply explained the game and did not have the children share their ideas about the skill and tactical performance. For example, Jim presented the learning task like this:
The next thing we are going to do is dribble tag. I am going to split you up into small groups in your area... Here is what you are going to do... They are trying to flee. In order to flee from the chaser, you are going to work on changing directions.

He did not ask any questions that invited the children to communicate their ideas about playing the game successfully. The lesson transcripts also indicated that the novice teachers did not guide the students to work together productively and cooperatively.

Evaluation of the taped lessons revealed differences between the experts and novices in Teaching Practices I and J (guiding students’ discussion about movement quality, and facilitating partner or group work, respectively). With respect to Teaching Practice I, the expert teachers were more likely than novice teachers to encourage students to communicate their ideas about movement quality. Similarly, with regard to the Teaching Practice J, when the students were working together, the expert teachers almost always urged them to think about how well they could work together productively and cooperatively. In contrast, the novice teachers seldom or never exhibited this constructivist-oriented teaching when responding to students’ group work.

Factors Contributing to Different Teaching Practices. The experts’ and novices’ different perceptions of social interaction likely contributed to the differences in facilitating social interaction and cooperation. For the expert teachers in this study, social interaction involved creating opportunities for students to share ideas with each other, jointly solve problems they encountered, and reciprocally coach each other’s skills when working with a partner and group members. These teachers characterized their roles as facilitators and mediators. Their understanding of teachers’ roles reflects sociocultural constructivist perspectives of teaching. From this standpoint, teachers should facilitate, guide, and mediate students to work together in a cooperative and productive manner (Brooks & Brooks, 1993; Prawat, 1992). In contrast, the novice teachers in this study viewed social interaction as providing the children with opportunities to work with a partner or group members. They neglected teachers’ roles in guiding students’ group work. Their lack of thorough understanding of social interaction might influence them not to enact constructivist-oriented teachers’ roles in practice.

Creating opportunities for students to work together is necessary for social interaction to take place, but it is not equated with social interaction. Students will probably not automatically learn to function cooperatively and productively when they work together. Without establishing rules and norms for group work, communication, negotiation, collaboration, and cooperation will not be achieved (Brooks & Brooks, 1993; Prawat, 1992). Therefore, to help students learn to work together, teachers should establish ground rules and norms for students to learn from each other and discuss questions with others. Establishing the rules for productive group work, however, is a long-term process (Brooks & Brooks, 1993). In this study, the expert teachers’ curriculum objectives for the year and their teaching experience might be another factor contributing to the salience of facilitating social interaction. The expert teachers’ curriculum objectives focused more than learning skills and games. Put another way, the expert teachers had broad goals for the year. It is likely that these goals would be part of some daily lessons. For example, one of Dianna’s goals for the academic year was to develop the children’s cooperative abilities. Although this study only focused on how the teachers taught three dribbling lessons, in each of her three lessons Dianna had the children work exclusively in groups to design their own games and game rules and set up their own obstacle courses. She spent a portion of each lesson guiding the children’s discussion about game rules and tactics. The expert teachers’ interactions with the children over the academic year and in kindergarten through fifth grade, allowed them to pursue broader and longer-range goals with the children.

In contrast, the novice teachers were new to the school setting and had interacted with the children for 8 weeks. It is hard to expect students to learn, over a short period of time, how to contribute to group work, listen to others, and communicate to others. On the other hand, the novice teachers’ rules for group work focused more on determining behavior problems than facilitating students’ growth in terms of affective and cognitive domains. As Schepp, Sparkes, and Templin (1993) noted, a primary concern for beginning teachers is how to deal with discipline problems and control the class. Thus, it is not surprising that the novice teachers in this study designed many more individual than group tasks in their dribbling lessons and did not focus on facilitating children’s social interactions.

Summary, Conclusions, and Implications.

The characteristics of the expert teachers’ teaching in this study can be summarized as follows. First, the expert teachers facilitated students’ self-responsibility and self-regulation by engaging them in problem solving activities and thinking processes and guiding students in critical thinking about movement quality and elaborating on their limited movement responses. Second, the expert teachers helped students make connections between what they had learned and what they were learning by activating the students’ prior knowledge and emerging relevance. Third, the expert teachers facilitated students’ social cooperation by establishing and reinforcing the rules for group work and guiding students in discussing and sharing ideas with one another in productive ways.

The novice teachers in this study also demonstrated some characteristics of more expert constructivist-oriented
teaching, including encouraging students to be actively engaged in exploratory and discovery learning activities, helping them elaborate on their initial responses to the movement variety task, and guiding students in sharing ideas about exploring the movement variety task. These teaching practices were related to designing and teaching movement variety learning tasks. Rovegno (1992a, 1993a, 1995b) reported that preschool teachers learned how to design and present movement variety tasks. These tasks were the salient aspects of the movement approach the preschool teachers used to differentiate the approaches from traditional physical education programs. Constructivist-oriented teaching within a movement approach, however, demands more than presenting movement variety tasks. The novice teachers in this study lacked the ability to facilitate students’ self-regulation, critical thinking, and sharing of ideas about movement quality in a constructivist-oriented manner. In addition, the novice teachers lacked the constructivist-oriented techniques to activate students’ prior knowledge and emerging relevance.

It is concluded that the EGOR is a reliable and validated tool to assess and diagnose experts’ and novices’ constructivist-oriented teaching practices. The expert teachers in this study demonstrated three dimensions of constructivist-oriented teaching practices documented in literature on constructivist perspectives of learning and teaching. It is promising that, despite some differences, the novice teachers exhibited some constructivist-oriented teaching practices similar to the expert teachers. The results of the study provided the target goals for novice teachers to achieve in their professional development.

The results of this study suggest that to help preschool teachers acquire more expert-like characteristics in constructivist-oriented teaching, teacher educators need to go beyond helping preschool teachers understand how to design a variety of movement experiences. More specifically, teacher educators might use a scaffolding technique to initially provide preschool teachers with a framework about how to: (a) present movement variety tasks accompanied by asking students to self-regulate their movement quality, (b) guide students to use their reflective inquiry and critical thinking to identify problematic movement responses, (c) link students’ prior knowledge and life experiences to learning new information, and (d) guide students to cooperate with each other during group work. The scaffolding would help preschool teachers understand that movement exploration does not equate to “hand off” teaching. As preschool teachers learn how to implement these constructivist-oriented teaching practices and gain an understanding of how to put abstract ideas about constructivist-oriented teaching into practice, they can be expected to experiment gradually with one of these teaching practices at a time and focus on enacting another teaching practice at another time. Although the nature of short-term field experiences makes it difficult for novices to implement some aspects of constructivism, because they do not know the children well, it does not mean it cannot be done; it is just an important barrier to consider. Toward this end, teacher educators can use an assessment rubric or systematic observational instrument on constructivist-oriented teaching practices to help preschool teachers self-evaluate their teaching during their field experiences. This will enable teacher educators to guide preschool teachers in reflecting on their problems in enacting these teaching practices and the aspects of constructivist-oriented teaching they must improve in the future. The loop of observation, teaching, evaluation, and reflection can help preschool teachers construct a deeper understanding of constructivist-oriented teaching practices.

References


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**Authors’ Notes**

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