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Thinking Processes, Management Routines and Student Perceptions of Expert and Novice Physical Education Teachers.

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Thinking Processes, Management Routines and Student Perceptions of Expert and Novice Physical Education Teachers

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by

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DEDICATION

My father, Robert Rayhill is greatly responsible for my ability to persist through any difficult endeavor. Even though he is gone, the things he taught regarding hard work, determination and putting forth your best effort remain with me.

Foreword

This manuscript is written in the format of the American Psychological Association. The body of the paper is presented in the format of submission for publication to scholarly journals. Additional information concerning measurement instruments and procedures, statistical procedures, tables, and studies reviewed for the study are presented in the appendices.

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Abstract

This study examined thought processes including problem-solving and interpretations of instructional situations of expert and novice physical education teachers at two grade levels. Four expert and four novice teachers (two each at the third grade and two each at the seventh grade) participated in the study. Thoughts, concerns, decisions, and awarenesses of expert and novice teachers during instruction were evaluated as well as their students' perceptions of the instruction. A total of 144 students were interviewed. Class rules and management routines established during the first week of the school year by two of the expert teachers (one at each grade level) were also identified and discussed. The results revealed substantial differences between expert and novice teachers in their thinking processes. The experts in this study resembled experts who have been investigated in the classroom and other fields. Specifically, the expert teachers when compared to novice teachers: (a) could more accurately interpret situational events pertaining to instruction, (b) achieved greater insight and made more inferences from pertinent teacher and student behavior cues available to them, (c) provided more descriptive information and included more creative solutions to problems presented to them, (d) were more concerned with individual student needs in both hypothetical and real situations, (e) focused on pupil learning and attentiveness to a greater extent in both hypothetical and actual instructional situations, (f) primarily based decisions during interactive teaching on student skill performance, with a low percentage of management concerns, and (g) stimulated their students to spend more class time (three-fourths of instructional

time) thinking about skill performance and activity concepts and less time being confused about procedures, drills, skill performance and class routines. The two expert physical education teachers selected for detailed study spent considerable time during the first week of school introducing and rehearsing effective class routines which were maintained throughout the year. The novice teachers in this study were concerned primarily with managerial and procedural facets of instruction.

The 1985 American Educational Association Presidential address by David Berliner, "In Search of the Expert Pedagogue" (Berliner, 1986), focused attention on the expert/novice paradigm in education (including physical education). Although some researchers had already addressed the topic (e.g., Housner & Griffey, 1985; Leinhardt, 1983; Sherman, 1979; 1982), more recently a number of studies have focused on the study of expertise, both in classrooms and in the gymnasium (Berliner, 1987; Carter, Cushing, Sabers, Stein, & Berliner, in press; Carter, Sabers, Cushing, Pinnegar, & Berliner, 1987; Howell, 1987; Leinhardt & Greeno, 1986; Leinhardt, Weidman, & Hammond, 1987; Shulman, 1986; 1987). Typically, these studies have explored whether expert teachers exhibit similar characteristics as experts in other fields. Research on expert/novice differences in teaching evolved from cognitive psychology studies which were based on the early work of de Groot (1965), who explored memory and information processing of expert and novice chess players. During the 1970's Chase and Simon (1973a, 1973b) expanded de Groot's findings about memory processes and problem solving of expert and novice chess players. Subsequently, Chi (1978) examined memory recall, contrasting high- and low-knowledge children in chess skill and Chi and Koeske (1983) studied the characteristics of a child with expert knowledge regarding dinosaurs.

Other studies of expertise have been conducted in physics, radiology, spatial mapping, and baseball knowledge. Summarizing the findings from these investigations, Berliner (1987) reported that experts: (1) often make inferences about objects and events; whereas novices usually hold more literal views of those objects and events; (2) often classify problems to be

solved at a relatively high level, while novices usually classify problems by surface characteristics; (3) when compared to novices, have fast and accurate pattern recognition capabilities; (4) are slower than novices in starting to solve a problem, that is, they seem to take longer examining the problem and building a problem representation; (5) build different problem representations than do novices; (6) when compared to novices, show greater self-regulatory or metacognitive capabilities; and (7) build competence slowly, over a considerable length of time with considerable amounts of practice. Berliner's initial investigations of experienced and novice teachers have demonstrated that many of the same characteristics of experts across domains are also evident with classroom teachers.

Through systematic analysis of the expert physical education teacher, invaluable information may be obtained to benefit teacher preparation programs and to better understand the complexities of teaching. Shulman (1987) and Berliner (1986) both maintain that case journals such as those in law and the medical professions might be established through this line of study, thereby facilitating the understanding of the teaching-learning process. While the intern in other professions has the advantage of consulting case journals when confronted with both routine and unique situations, these valuable sources are not yet available in education. Additionally, videotape libraries could be established which feature expert teachers in actual situations, establishing rules and routines, conducting difficult lessons and handling common discipline situations. The opportunity to observe and analyze "real life" models should provide valuable learning experiences for future teachers.

Questions regarding the expert teacher in physical education are similar to those which have been asked for years about the outstanding athlete. What makes expert teachers successful? What makes them unique? Specifically, how can some teachers effectively manage 30 to 40 students, provide stimulating activities, monitor student performance while providing corrective feedback, and still allow for individual differences? In contrast, other teachers simply strive to "make it through the day".

The purpose of this research was to study expert physical education teachers and compare these teachers with novice teachers, in order to provide information about cognitions which precede behaviors in the gymnasium. The study was conducted in four phases, each phase designed to determine whether expert teachers in the gymnasium resemble experts in other fields as well as the classroom. Phase 1 was designed to describe and compare how expert and novice teachers perceive, process, and interpret class events and teaching situations in physical education. Phase 2 focused on the interactive thoughts and decisions of the two subgroups. Phase 3 examined the thinking processes of students taught by experts and novices and how these students perceive the learning activities. Finally, Phase 4 explored the rules and management routines established during the first week of school by expert teachers.

Phase 1

Interpretation of Class Events and Teaching Situations

Recently, Berliner (1987) and Carter et al. (in press) studied expert and novice teachers' perceptions of visual information about classrooms to determine

differences in processing and interpreting actual classroom data. Subjects were asked to describe and discuss classroom management and instruction while viewing a slide presentation of science and mathematics lessons. The findings revealed that, in general, expert teachers were better able to interpret information and make inferences about the data, whereas novices held more literal views.

Typically, when compared to the novices, the experts were able to recognize the patterns presented quickly and accurately. Novices did not usually perceive the same cues, thus they were unable to make inferences in the same manner as the experts. Moreover, when discussing classroom management and instruction, the focus of the experts was on the notion of work, that is, students actively engaged in learning tasks. They exhibited concern over student learning to a greater extent than did the novices and used their knowledge of classrooms to make assumptions about what was happening in the slides they viewed.

In a study reported by Hanninen (cited by Berliner, 1987), three groups of teachers of the gifted were compared in their analyses of five scenarios or case studies. Expert and novice subjects were asked to read and make recommendations for each case. Expert teachers reportedly used a higher-order system of categorization in their analysis of each situation presented to them. The author also reported a difference in mean times between experts and novices in the analysis of the problem and the subsequent solution. This finding coincided with those reported in cognitive psychology regarding the length of time experts take to structure a problem solving activity (Berliner, 1987).

Based on these preliminary results from the educational literature, expert teachers resemble experts in other fields in their ability to interpret and process visual and situational classroom information. No studies, however, have been designed to study expert/novice differences in the interpretation of events in the gymnasium. Thus, the specific purpose of Phase 1 was to investigate differences in interpretation of class events and teaching situations by expert and novice physical education teachers.

Method

Selection of Subjects

To address the issue of verification of expertise in teaching, several factors were considered in the selection process of expert physical education teachers. First, recommendations of outstanding teachers were solicited from the East Baton Rouge Parish supervisor of physical education. From these names, only teachers with 10 or more years teaching experience at their present grade level assignment were considered. One criteria of expertise was either consistent participation in a middle school physical fitness assessment program, or student participation and consistent performance in a parish-wide elementary physical fitness spring meet. From the names of teachers meeting the initial criterion, four teachers, two at the elementary and two at the middle school level were selected. These four teachers had a reputation for having excellent physical education programs and were known by the investigator, who had taught for 6 years in the local parish public school system at both elementary and middle school levels. Other factors taken into

consideration were matching teachers for similar teaching experiences and the perceived likelihood that the investigator could establish a trust-relationship with the teacher so that open and honest responses could be obtained during interview sessions.

Following these preliminary steps, an external trained evaluator and the investigator separately assessed the teachers' on-the-job performance using a meritorious teacher performance assessment instrument, the Teacher Assessment and Development System - Meritorious Teacher Performance Form (TADS-MTP). The instrument contains 82 teacher behavior indicators clustered into four domains: knowledge of subject matter, techniques of instruction, classroom management, and teacher-student relationships. A score of 70 or greater was established as a criterion ranking for teacher expertise. This score was based on normative data of teachers participating in a merit pay structure.

To verify expertise, each teacher was videotaped on two separate occasions and each lesson was analyzed separately by the two trained evaluators. An overall interrater agreement of .97 was established for the total instrument with coefficients for each subcomponent ranging from .75 to 1.00. Two lessons for each of the eight teachers were analyzed by both of the evaluators.

A description of demographic characteristics of the expert teachers ($\underline{M}$ years teaching experience = 15.2) is provided in Table 1.

Insert Table 1 Here

Novice teachers were students enrolled in their student teaching practicum in the School of Health, Physical Education, Recreation and Dance at Louisiana

State University (M age = 24 years). After completing the process for university approval through the Human Subjects Committee, and receiving permission from the administrative personnel for East Baton Rouge Parish School Board, informed consent forms were completed by all subjects. Additionally, subjects completed questionnaires which included demographic data and their philosophy and goals of teaching.

Training of Teacher Evaluators

The two evaluators were trained during a university supervision and instruction course by a university professor who was one of the developers of the TADS-MTP. First, the instrument was explained with full description of each teacher behavior indicator. Second, videotapes of several lessons across contexts and grade levels were viewed and discussed in regard to scoring. Third, another set of videotapes was shown and actually scored by the evaluators. The results were compared with those of expert evaluators and discussed where discrepancies occurred. Next, the evaluators received field training by assessing several lessons conducted at the University Laboratory School. These assessments were then evaluated by the university professor, and approval was obtained regarding demonstrated competency in the use of the instrument by the two evaluators.

The expert teachers surpassed the criterion score of 70 (ranging from 72 to 81) and none of the novice teachers rated a 70 or greater (scores ranged from 20 to 63). There was greater variability in performance assessment among the novice teachers. The most consistent area of weakness among the novice teachers was in providing specific feedback and monitoring learner's performance.

Procedures

Slide Presentation. A slide presentation of an advanced gymnastic lesson at a middle school was prepared to examine how the expert and novice teachers perceive visual information about physical education classes. A slide presentation rather than a videotaping was chosen so that subjects would have to infer more information about the events that occurred.

Parental permission was obtained for the students participating in the lesson used for preparation of the slide sequence. The teacher and administrative personnel also submitted informed consent agreements.

A total of 59 slides was used in this task representing a full spectrum of class events encountered from the time the students entered the class until they left for their next class. The teacher was asked to instruct the class in a usual manner with one exception. The investigator selected three events a priori which would be typically encountered at one time or another in a physical education class. These three incidents were: a student not dressed for class participation (i.e., "sitting out"); an injury during class; and, a student who is dressed for participation but does not engage in activity for the majority of the class. Slides were arranged sequentially.

The subjects were instructed to observe the sequence of slides depicting the physical education lesson and following the viewing, to reconstruct the events of the lesson. They were told to write a story describing what had occurred along with their personal reaction to the entire lesson. No other information was provided regarding contextual factors or the teacher and student characteristics. This activity was designed to allow the

subjects an opportunity to become familiar with the lesson from beginning to end in order to reflect on specific events and students.

After the initial descriptions were completed, the slides were viewed a second time. For this task, the instructions were to stop the presentation to discuss any of the slides they felt pertinent to classroom management and instruction. Comments were audiotaped and later transcribed.

Scenario Analysis. During a separate testing session, teachers were presented five scenarios of instructional situations. Teachers were asked to read each scenario and write a response detailing how they would react if the situation occurred during their teaching. The following issues were addressed: Scenario 1) classroom management and social relations; 2) facility/ curriculum problems and relating with other faculty members; 3) teaching a low socioeconomic status student who is experiencing ridicule from classmates; 4) teaching a high-skilled athlete who dislikes routine drills; and 5) evaluating an overweight child in a fitness unit (see Table 2).

Insert Table 2 About Here

Using a scenario developed by Hanninen (cited by Berliner, 1987) as a guide, these scenarios were constructed to represent a variety of real-life experiences a teacher often encounters. The investigator had experienced the events during years of teaching in the public schools, so the scenarios were true situations. Five broad areas within the realm of teaching were illustrated: management and discipline; social and

physical individual differences; curriculum design challenges while coordinating activities with other faculty members; evaluation of student performance; and the emotional and social well-being of students regardless of ethnicity, socioeconmic status, or religious affiliations.

Teachers were timed to determine the length of time taken to begin recording responses and the total time needed to complete the task. The scenarios were designed to approximate the length and style of scenarios used in the Hanninen study (cited by Berliner, 1987).

Data Analysis

The typed protocols of the comments subjects made after stopping particular slides or combinations of slides were analyzed to determine if experts and novices differed in (1) the total number of slides discussed, (2) beliefs about salient management and instructional characteristics (i.e., what they chose to comment about), (3) the amount of accurate detail provided in the comments, and (4) the ability to make inferences about objects and events. Perceptions of the three events selected a priori were described in detail for the two groups of teachers.

Written responses to the five scenarios of instructional situations were analyzed to determine if experts and novices differed in (1) the time needed to complete a response, (2) the degree of detail provided and the alternatives mentioned, and (3) how the problem situations should be solved.

Results and Discussion

Slide Presentation

Expert and novice teachers did not differ in the number of slides discussed (novices: M = 36; experts: M = 35), nor the specific slides selected for discussion. Thus, neither group of teachers seemed to show a pattern in choosing events to make comments. Carter et al. (1987) reported a more definite pattern among expert mathematics and science teachers when stopping slides. In the present study, one novice and one expert commented on nearly every slide, while others stopped at various parts of the lesson. One novice only remarked about 10 slides, thus the investigator stopped the presentation at 15 additional points (these were not included in averaging number of times subject stopped presentation). Only eight slides were commented on by all eight participants. However, differences were found in the ability to perceive and interpret a physical education lesson.

The expert teachers responded in greater length and detail than the novices. Experts repeatedly compared the lesson to their own teaching experiences and readily expressed opinion about what they liked and disliked about the instruction and situation. They were better able to view the entire setting, making observations on facilities, students, and teacher actions. In other words, they were better able to make sense of all facets of the contextual cues. The novices, in comparison, focused on one or two students, or perhaps, the teacher and a student, rather than all the information available from the slide. The following examples and those used throughout this paper are verbatim quotes taken from transcripts of teacher interviews and responses to written

reports. The quotations provided represent repetitive emergent themes from all the transcripts. Words have been placed in italics to highlight statements that were repeatedly provided by the subjects.

Novice: (Slide 3) Here they're doing something... either the teacher is giving instructions or calling roll or something. It's in a gym, it's wide open space...all the students are sitting down on the floor...not in desks and they're sitting dressed out.

Novice: (Slide 3) Okay, well, I mean, she's instructing...she's telling them what she's expecting..this is what we're going to be doing..this is what I'm expecting of you, blah, blah, blah.....

Novice: (Slide 3) I think she's calling roll.

Expert: (Slide 3) I cannot believe the p.e. teacher actually gets to sit down. I have never..oh, I meant to say something about the bulletin board. I forgot about that. Well, she's got a visual aid, okay..... that's good that she's got her visual aid up there for her students..uh..and that she has a desk because a lot of times you need something and you have to go to your office to get it..that's a problem I have. She has everything right there...that's terrific! She has mostly white students, just a handful of blacks and she has just one boy. She has three black girls and the rest white. So predominantly white class with the boy, you know. She must be giving some kind of instruction. It seems to take a long time at the desk...I don't know...because if she just had to check roll, you could do it like that (snaps fingers). She's got to be talking about something..because they seem very attentive. She

doesn't have any behavior problems.

Expert: (Slide 3) all right, this looks like the teacher is beginning to take roll and tell the class exactly what they're going to be doing today during class..uh, probably during the beginning of the class ...looks as if some of the students are not dressed out..at least one, anyway...she has on her school clothes not dressed in gym shorts ...or gymnastic leotards...the teacher has visual aids available ... they seem to be paying attention

Expert: (Slide 3) she seems to be calling roll... maybe giving a few pointers about what they'd be doing for the day...uh, I'm sure what events they'd be working on..what apparatus, uh, which groups would be working on which apparatus...uh, she seems to have everybody's attention...they're looking at her

Expert: (Slide 3) I like the informal...uh, I take that approach, too; but I don't like the teacher sitting behind the desk...she can sit on the front of the desk...that'd be all right, but I feel you miss something and it makes her staring down at the kids since they're spread out sitting on the floor. One child has her back toward the teacher...where the teacher cannot see them and uh, I don't like this..I want all the kids where I can see them. But all the kids seem to be listening to what she's saying... The teacher is calling roll and giving instruction for the day.

In the examples of the expert teachers, each teacher remarked about student attentiveness. None of the novices was concerned with pupil behavior. Instead, each novice focused on teacher action, with one novice noting facilities and location of students. Novices simply

described what was viewed, no inferences were made from the observation. The implication made by the first expert teacher regarding the length of time to take roll was absolutely correct. This was a homeroom class with the teacher describing procedures to her students for a Christmas project for needy children. This demonstrates the expert's fast and accurate recognition of events occurring in familiar settings. This finding concurs with those by Chase and Simon (1973) of expert and novice chess players. The expert chess players were able to make fast and accurate assessments of chess pieces placed on a chess board. Because of the inferences drawn regarding player positioning, the expert chess players could make more successful game decisions.

In response to one of the management concerns which the investigator staged (i.e., student not dressing for activity), the novice teachers only described the situation rather than offer solutions. Conversely, the experts freely communicated approval or disapproval and presented suggestions to make class improvements.

> Novice: (Slide 12) One student way off back on the stage sitting there. She's not dressed out so maybe that's why she's not participating. She's not doing anything in particular...sitting and watching.
>
> Novice: (Slide 12) Okay, here I notice this one student just sitting in class. Uh, I don't know whether she's sick or excused or if she just refused to dress out. To me it looks like she just plain refused. She's not doing anything; she looks like she's just sitting there.
>
> Novice: (Slide 12) This one girl's not dressed out ...she's just sitting there. I think she should do

something...not just sit there.
Novice: (Slide 12) well, I couldn't tell, what I'm assuming is that this is an on-looker ... somebody's just walked in...maybe someone that's late to class or someone who's hesitant about doing gymnastics...a little scared so they're off in another area just watching

Expert: (Slide 12) This one little girl just sits there. See, my idea of students not dressing..we, uh...give them an assignment. We send them..we have a place we send them. I know not everybody has that opportunity, but...I would make her do something, not just sit there. She could do a written report or something. I think it helps..she might have a doctor's excuse, or whether she's forgot her gym suit, I think they ought to be given something to do ...if it's just read something on drugs and do a report or just any little thing, you know, than just sit there, because a lot of them will just cop out and not dress because they'll know they can simply sit there.
Expert: (Slide 12) here is one girl on the stage area...she's the one I noticed earlier who is not dressed out...uh, she could have a doctor's excuse or something...but she's far away from the remainder of the class and she should be involved..
maybe with spotting or at least in a closer proximity to the rest of the students..she needs to learn just like everyone else in the class...the teacher doesn't need to be worried about what she is doing, either... if something is missing from the teacher's desk or any of the student's belongings...she may have to take responsibility...the doors are so close by...if

she wants to leave, that's always a possibility and the teacher is responsible for her ...she's just not involved in the class in any way....

The expert teachers, when compared to the novices, displayed more sensitivity to involving all students in the lesson. Both experts provided possible explanations for the student behavior (i.e., doctor's excuse), while only one novice suggested an excuse (i.e., she might be sick). One novice misinterpreted the situation suggesting the student just walked into the class and was afraid of gymnastics. As Berliner (1987) reported, if novice teachers cannot perceive the same cues, they cannot make the inferences which guide the experts' understanding of the classroom. From studies of expert and novice physics students, Glaser (1987) suggests that the limitations of novices' thinking are due primarily to their inability to infer further knowledge from the literal cues in a problem situation.

The following excerpts depict how the teachers reacted to a non-participant physical education student, which in this case, was the only boy in the class. As with the incident with the non-dresser, this particular behavior was contrived a priori between teacher and investigator.

Novice: (Slide 25) Okay, two things...the boy is.. it looks like he's trying to get himself "psyched up" to begin work on that pommel horse..uh, but he's the only one and that particular event..it's a male event ...but the girls are moving pads around so they're setting up their own area to work. I thought it was funny the girls up in the area behind there..watching ...they're saying, "Gosh, I wish we were down there

in gymnastics".

Novice: (Slide 25) The mats whould have already been out there. Also, the boy, he's not doing anything.

Novice: (Slide 25) The students are helping each other pull out the mats. I also notice the boy is just sitting there and the other students from other classes are watching.

Novice: (Slide 25) Okay, obviously they need to add some extra mats somewhere so she's assigned two students to get this done. We have this other fellow ..he's kind of not sure if he's ready to participate with all these girls in here

Expert: (Slide 25) These kids are looking through these windows and they can't be paying attention to their own teacher...and this poor dude..he wants to do something..this guy just lays on this horse..I would just like to know his story...does he ever do anything? He just leans on that thing the whole class period. Well, she talked to him later, but there was never a slide of him jumping. That's not fair! You've got to think that he chose to be in here, okay. Now why isn't he working like the girls are? And these kids in the background here, now they could cover those windows up. Those kids are looking in and they can't be paying attention to their own teacher. They were looking at this gymnastic class. If I was the teacher in this other class, I know I'd cover those windows with some poster paper..paint them ..or something!

Expert: (Slide 25) I see a young man who's taking in what's going on in the class but he's not taking part in anything...he seems to be just observing;

he's not causing any distractions or anything..any problems; but he's just being a loner back there... he kind of looks like he's trying to decide if he's going to take part or not and I noticed later on that she goes back there and talks to him...the girls look like they're pulling out mats..so maybe it's an early class in the day...and they're setting up...is that another class there behind the stage? It appears to be...they look like they're watching you film I'm sure...they want to get on camera. We're going to do our stage like that, you know, enclose it, but we're not going to put any windows in it, that's for sure! We don't want anything that is going to cause any distractions, you know, we want something...a closet we can put them in and work with them by ourselves.. They should cover those windows..I'm sure the teacher doesn't let that go on everyday...it must have been the excitement of you being there with the camera.
Expert: (Slide 25) Here the boy is leaning on the end of the side horse...doesn't seem to know what he's supposed to do or doesn't want to do it..two girls are getting additional matting to use on the bars to raise themselves up to be in a better position for spotting...there seems to be an extension cord coming out the window of the stage area which could possibly be a safety factor for the boy at the horse. There's a group of students looking out the windows from the other class... guess they're interested in what's going on here instead of paying attention to their teacher... those windows need to be covered and could be done so easily.

As in the previous example, the experts display concern over involvement of all students, even the attentiveness of students in another class. In fact, each expert reported the same solution; that is, cover the windows, so the two classes could not distract one another. The novices noted the problem, but did not suggest a way to alleviate it. The experts also made some very accurate inferences from this one slide. The boy had chosen to be in this elective gymnastic class, it was an early morning class...first hour, and the students needed mats to elevate themselves for spotting purposes.

The final incident which was constructed for purposes of this study was of a girl falling from the uneven parallel bars. Injuries are likely to occur at one time or another in the gymnasium or playing area, so it was of interest to assess how the two groups of teachers would react. Two slides prior to the incident showed the girl not paying attention to spotting techniques in her group and then going toward the teacher to get the teacher's attention. A series of four slides illustrated the injury scene: the girl on bars ready for dismount, the girl landing face down on the mat, girls from the group surrounding the injured student, and finally, the teacher leaning over the student. It was fairly evident the girl was not seriously injured, thus neither group of teachers was highly concerned over long-term effects from the fall. For instance, one novice began his response, "Ah, she wiped out!", indicating a relaxed approach to the incident.

However, differences similar to those previously described were noted between expert and novice teachers' responses. Novices were short and merely descriptive in their responses, whereas experts reported how they usually handled these situations and provided possible

explanations for the fall. Only one novice expressed how he would respond to this situation; he stated, "I would have checked on her". The remainder of novice responses only described the fall and teacher coming to the scene. For example:

> Novice: (Slides 38-40) The three slides ...the girl had fallen. I noticed that two of the girls went to help her and then the teacher came and helped her. I couldn't tell if she was really hurt or just fell and was kind of shaking it off or something...But I noticed the teacher was right there to make sure she was okay.

For the experts, however, additional information was provided.

> Expert: (Slides 38-40) I think it's good that nobody's trying to move her. I noticed that four girls were still there...I was hoping maybe three would be there and one had gone to get the teacher. I don't respond to falls real quickly..I watch and survey, so I'm not worried that the teacher is not there yet, but, uh,...because I given them a little time...a lot of kids are disappointed when they fall, embarassed or whatever, uh, usually you can tell by the fall if it's a real bad injury, so ...my heart wouldn't even skip a beat at this point. I've seen too many...now, if I had seen the fall, especially, if somebody told me she's not moving, I'd be there very hurriedly and probably send someone to the office to see if the nurse was there and of course, if I thought it was life-threatening or something I would definitely give them the 911 number and tell them to go ahead and call. But right here, I'm not overly concerned...I would have seen if

she's responding okay, like the teacher did...I think this is the right approach to take.

Expert: (Slides 38-40) her dismount wasn't too good ..well, it doesn't look like she hurt herself too bad ..maybe she turned an ankle, hurt her wrist, I don't know..I would have come to her; I've learned never neglect anything anytime because you never know when a child is faking it or not...I wouldn't have neglected it but I would have tried to tell her, let's get up..shake it off, because I could tell there really wasn't a serious injury. I'm sure the teacher was well-trained to deal with it anyway.

Expert: (Slides 38-40) I guess the girl landed wrong..fell from this position. It looks like she could have hurt her shoulder or something..but this was the girl that was not paying attention to her group earlier...the one trying to get the teacher's attention...she could have possibly done this on purpose to get the teacher to pay attention to her.

Expert: (Slides 38-40) Well, accidents are going to happen and I don't think most of them...they just crave so much attention, but I know, I think that's a fault I have, I guess I need to be more sympathetic but...everybody's probably going to run over there. They should have had some spotters over here on this side..they were all on the other side.

The first two experts showed sensitivity to the student's feelings; for example, possible embarassment, while the other two experts made the same statement reflecting a possible motive for the fall (i.e., the need for attention). One expert also indicated that better spotting techniques might have prevented the incident.

Overall, the findings strongly suggest differences between expert and novice teachers when reacting and interpreting actual classroom situations. The results support and expand the findings of Berliner (1987) and Carter et al. (in press) of expert and novice classroom teachers. Specifically, experts, when compared to novices: (a) exhibit fast and accurate recognition of events in physical education classes, (b) provide longer and more detailed analyses of situational data, (c) contrast events to their own instructional and management styles, beliefs, facilities, and student behaviors, (d) are more concerned with student attentiveness/student engagement and the involvement of every student in activity, (e) interpret more cues from limited information enabling them to impose more meaning and make more inferences from these cues, and (f) offer explanations for student behavior and provide more suggestions for handling difficult and/or common situations in the gymnasium.

Scenario Analysis

There was only a 20 s difference in mean times between expert and novice teachers to read and begin to respond to each scenario (novices: *M* = 51 s; experts: *M* = 1 min 12 s). Differences were observed for total time taken by expert and novice teachers to describe reactions and procedures for handling the situations. Experts averaged 7:24 min while novices spent an average of 4:17 min for each scenario.

In addition to longer responses, experts provided more approaches for solving each problem than novice teachers (experts: *M* = seven solutions per scenario; novices: *M* = four solutions). The typical response from

the novice teacher was to select one or two issues within the scenario and react to those. Experts addressed more issues and in greater detail.

Several results were similar to differences found between the two groups during their reactions to the slide presentation. Experts responded by stating the typical way they would handle such a problem. Each expert used statements such as "I usually stress", "I've done this many times", and "what I usually do". In several reactions by the novices, responses were textbook-style, using "teacher should" statements. The following reactions to scenario three which described a low socioeconomic student illustrate this point.

> Novice: No child should be ridiculed by anyone. This should be stopped immediately. Rudi's self-esteem and confidence must be bolstered. The teacher should encourage any success no matter how small. The class should be taught to think of the entire class as a team, and every member of the team should be respected for what and who they are. Home problems should be referred to school personnel.

> Expert: I would have the school nurse talk with Rudi about her personal hygiene. I would check into having a social worker sent out into the home. I would have our school nurse furnish the student with soap, soaping powder, skin cream, lotion and or powder (I have done this many times). In individual activities, I would try to give her some special attention. Try to talk with her and show interest in her. Develop some trust--so I can make some comments to her that might help her. Have her feel confident

> enough to ask me if she needs help. In team sports--make her captain once so she can show the others she can be a leader even if she has other problems. I would start by being her partner and showing other students they could help her with her problems if they could learn first to treat her like anyone else.

In the two reactions, the novice describes the problems, but does not express how he or any teacher would accomplish solving the problem. He states the teacher should encourage success...but how? ....This should be stopped immediately...but how? This is very similar to superficial descriptions provided in reacting to the slide presentation. The expert explicitly outlines solutions to each problem presented in the scenario.

These findings are similar to those reported by Berliner (1987). For example, one of the novice's in the Hanninen study recommended, "Mark should be encouraged by his teacher to continue his science experiments and work on his computer". Rather than describe methods to encourage Mark, the novice merely suggests that encouragement is needed.

Throughout responses to each of the scenarios, experts were consistently more thoughtful about individual needs of students than novices. Perhaps through years of seeing neglected children, a deeper sense of concern develops. They responded to several issues by stating they would work with students on a personal one-to-one basis. For example with Scenario Three: "...conference with the child..", "I would talk to Rudi first.."; Scenario Four: "Individual conference would be the first approach I would try", "I would search for the one weakness this individual has and have him try to improve

on it as we go through practice sessions. I would make his turns more challenging..make him perform skills with non-dominant hand...find a weakness, create a challenge", "a private conversation with Bo ...";
Scenario Five: "I would talk to William and explain that the procedure for losing weight takes a lot of effort and a long time....", "I would set a time and day before school that William could weigh in to me...I would explain to him that fitness is not achieved over a 3 week period...", "I would ask him how he felt about himself..".

Although novices did provide some examples of working with students on an individual basis, they were more inclined to seek help from the principal or make "teacher should" statements. For example, from:
Scenario Three: "I would make the problem known to the principal...., "I would go to the principal and discuss the problem", "the teacher should .."
Scnario Four: "I would punish him..write him up to the office if he continues ...", "Bo should be a student assistant...", "Bo should help students who are not as talented as he is....", "it is important for Bo to help his teammates...".

Experts also displayed a greater variety of sound principles of teaching. While there were a few suggestions provided by novices encouraging the use of positive reinforcement, each of the expert's reactions contained numerous positive reinforcement techniques. For example: (Scenario Five) "I'd find something positive about his workout....if I don't give him some positive reinforcement, I may lose his dedication to the task";"an individual sticker award would be presented"; "I would compliment him and emphasize his positive accomplishments".

Opposing beliefs were occasionally noted between expert and novice teachers. For instance, novices said they would assign partners in dance-related activities, while experts stated they allow students to choose their own partners in any partner-related situation.

Experts displayed a greater sense of being in control of the student and situation than novices. Several experts began reactions with, "This wouldn't be a problem for me because....". They described measures taken to prevent incidents from arising in their classes rather than dealing with problems only when they occur.

In order to illustrate how expert teachers responded more creatively, in greater detail and with a larger repertoire of solutions, examples of reactions concerning the facility/instructional problem in scenario two are presented:

> Novice: I would find out what type of equipment the school has and what type of activities were done in the past. Then I would do whatever type of unit I could.
> Novice: I would find a vacant room in the building. If there isn't one, I'd still have students involved in some type of health lesson or games that would take up limited space. When there are assemblies, I'd still have some games for the students.
>
> Expert: Activities would be set up in the classrooms that could reinforce reading, math, and writing skills. This would be a good time to go over rules of the games. I would have such things as crossword puzzles and word search activities, as well as rules sheets. During

these periods I would ask students to write short stories about their past experiences in volleyball or basketball, etc. The stories would help me better understand each of my individual student's needs and feelings. I would design my activities to fit the teaching environment (auditorium). I could use the music from the music teacher for a unit in rhythmic activities.

Expert: There are many activities, games, and puzzles that are health and sport related that I would use at this time of the year. We could play Sports Bingo and make up our own game cards and questions. We could buy some inexpensive games--dominoes, jacks, etc. Play Wheel of Fortune with some health facts. Give pencils as prizes. Give extra points as prizes. I would try to cooperate with the music teacher and would hope we could work with each other and not against each other.

Overall, the findings from the scenario analyses of instructional situations are similar to those from interpretations of a slide presentation of a physical education lesson. Experts, when compared to novices: (a) were more creative and thorough in descriptions of ways to handle various teaching concerns (b) presented the typical way they would address events, rather than responding in "textbook-style" statements, (c) demonstrated more confidence in managing students and situations, (d) provided more solutions to problems, (e) were more thoughtful to needs of individual students, and (f) displayed a greater variety of application of sound principles of teaching.

Implications for Teacher Training Programs

Taken together, interpretations of the slide presentation of a gymnastic lesson and scenarios of various teaching situations clearly demonstrated differences in ways expert and novice teachers react to and handle instructional events. Without exposure to "real-life" classroom situations, novices are limited in resources for coping with and providing solutions to such concerns. Teacher training programs can include tasks similar to those used in this investigation to provide students opportunities to reflectively think about and prepare for the complexities of the teaching environment. Expert teachers can assist university professors by reporting successful methods they use when confronted with difficult situations. Exploring how experts think and react can assist students in understanding possible solutions. Expert teachers can also convey what concerns are prevalent in the day-to-day activities in the schools. Overall, the results from both tasks, the slide presentation and the scenarios, suggest that expert physical education teachers, similar to those in other fields, possess different domain-specific knowledge schemata, as defined by Glaser (1987), than novice teachers.

Phase 2

Teacher Interactive Thoughts

Research on teacher thinking developed as an outgrowth of the process-product paradigm (Dunkin & Biddle, 1974) which emphasizes teacher behavior. The

assumption underlying the studies of teacher thinking is that what teachers do is affected by what they think.

In order to understand teacher action and the basis for decisions, studies have been conducted using a stimulated recall technique (Bloom, 1954) to assess teacher thoughts during instruction. The instructional phase is called the interactive phase of teaching. Teachers view a videotape of their lesson which stimulates them to recall their thoughts during the lesson. The results from research conducted in classrooms (Colker, 1982; Conners, 1978; Marland, 1977; Marx, & Peterson, 1981; McNair, 1978; Parker, & Gehrke, 1986; Semmel, 1977) and physical education (Housner, & Griffey, 1985; Howell, 1987; Sherman, 1982; Twardy, & Yerg, 1987) have suggested that only a small portion of teachers' reports of their interactive thoughts deal with instructional objectives and content of subject matter. A relatively large percentage of thoughts deal with instructional process including procedures and strategies. The largest percentage of reported interactive thoughts are concerned with the learner.

One noteworthy study (Housner, & Griffey, 1985) compared expert to novice teachers' interactive decisions. Housner and Griffey (1985) compared eight experienced and eight novice elementary physical education teachers in a laboratory setting. Using a stimulated recall interview (SRI), the authors classified teacher perceptions into two substantive categories: student behavior cues; and teacher/context cues. The primary cues attended to by both the expert and novice teachers were student performance (30% experts; 19% novices), student involvement (27% experts; 23% novices) and student interest (12% experts, 27% novices). Hence, differences in interactive decision making were found between experts

and novices in regard to student performance and student interest.

Housner and Griffey (1985) conducted their experiment in a laboratory setting with only four students per teacher. Moreover, these students were not known to the teachers. In order to determine the ecological validity of this experiment, Howell (1987) examined preactive and interactive thought processes of expert elementary physical education teachers in the school environment. However, as of yet, comparisons between novice and expert elementary physical education teachers have not been conducted in the natural teaching environment.

Most of the research conducted on interactive thoughts and decisions has been conducted in elementary school settings. A recent study by Norton (1987) examined interactive thinking of both elementary and secondary preservice students. Findings revealed differences between the two groups regarding pupil-related pacing of a lesson, pupil attitude, informational content, and plan-related pacing. There have been no investigations comparing expert and novice teachers' interactive thoughts and decisions in both middle school and elementary levels either in the classroom research or physical education literature. The purpose of this phase of study was to determine interactive thoughts, decisions, and concerns of expert and novice elementary and middle school physical education teachers.

Method

Subjects

The subjects for Phase 2 were the same eight teachers described in phase one.

Procedures

Each teacher was observed and videotaped once a week for 3 consecutive weeks of instruction of a physical education unit plan selected by the teacher. The following units were chosen by the eight teachers: aerobic dance, ball handling skills, bowling, fitness activities, soccer, track and field, and volleyball. Only two teachers, both who were novices, chose the same unit, soccer. A SRI was conducted within a 24 hour period and usually within 4 hours of the instructional period. This time-frame procedure was selected based on recommendations by Colker (1982) and Gaier (1954). A structured interview procedure was followed, and responses were transcribed verbatim.

An instrument of teacher thinking developed and used in the South Bay Study (McNair, & Joyce, 1979; Morine-Dershimer, 1979) served as a model to generate categories for coding teacher thoughts. Most of the categories from the South Bay instrument were used, but those dealing with specific classroom behaviors were deleted. The category "pupil learning" was subdivided into declarative, procedural and strategic knowledge. code teacher interactive thoughts. The instrument contains four major categories: decisions, concerns, information source, and awareness. Teacher statements regarding conscious decisions during the lesson segment include those made as a result of prepared lesson plans, pupil behavior, or supplemental planning. Teacher concerns focus on pupil behavior (i. e., pupil attention; attitude; learning/ declarative knowledge, procedural knowledge, strategic knowledge; and pupil-related pacing of lesson) and lesson implementation (i. e., procedures for management; instruction; organization;

equipment/facilities; and plan-related pacing of the lesson). Information source refers to cues used by the teacher to govern their thoughts, decisions and actions. These include teacher observation based on pupil verbal behavior, observation of skill performance, expectation of certain pupil behaviors, a hunch by the teacher regarding events, and a recall of past events which caused the teacher to behave accordingly. The final category includes teacher awarenesses of: principles of teaching, their own feelings, or behavior and, alternative teaching techniques that could have been used in the lesson. One question was asked of the teachers during the interview which was used in a separate analysis. The question, "What do you want the students to be thinking at this point in the lesson?" was used to match teachers' intended student cognitive processes to students' actual thoughts during instruction.

The investigator was trained by a researcher experienced in the process of analyzing interview transcripts of interactive decision-making of teachers trained the investigator. Two practice transcripts (one expert and one novice) were used for training sessions. Following these sessions, adaptations of the sub-categories of the South Bay Study instrument were made and a decision coding log was established.

The investigator and a trained researcher independently coded the interviews. Interrater agreement for the total interview was .87 and for each subcomponent within the four broad categories, coefficients ranged from .75-1.00. Interrater agreement for the four larger components ranged from .80 to 1.00. Disagreements were resolved by discussion and agreement on a final classification. Intrarater agreement was .99 for total interview with coefficients ranging from .83 to 1.00 for

subcomponents. Reliability was established on interviews which were analyzed at the beginning, middle, and end of data analysis. This procedure was undertaken to protect for experimenter drift.

Results and Discussion

In Table 3, the total frequency of categorized statements for the three interview sessions shows observed differences between the two groups of teachers, with novices expressing slightly more thoughts (M = 512 statements) than experts (M = 417 statements). Specifically, novices expressed more differences in teacher concerns during instruction (M = 290) than experts (M = 217, experts); whereas results for frequency of statements in other categories were similar for both groups (decisions: M = 78, novices; 74, experts; information source: M = 65, novices; 64, experts; awarenesses: M = 79, novices; 62, experts). Off-task statements were relatively non-existent for both groups of teachers throughout interview transcripts, although novices did seem aware and concerned with supervising teachers' opinions or presence during videotaped lessons. Frequency of task-relevant thoughts may be inflated because of methodological procedures which allowed teachers to stop the videotape. This limitation has also been acknowledged by classroom researchers (Clark & Peterson, 1986) who have employed the same interviewing procedures. Hence, because teachers are asked to stop the tape at any point in the lesson where they are consciously thinking in a certain way or where they are consciously saying, "Let's see, I think I'd better do this now, or "I guess I'll try this", they are more likely to report task-relevant thoughts. This is not found, however, in

the way students respond to interview protocols. Students readily report off-task thoughts. This is demonstrated in Phase 3 of this study and in previous classroom investigations (e.g., Peterson, Swing, Stark, & Waas, 1982).

Insert Table 3 About Here

Teacher Interactive Decisions

Interactive decisions as defined by the majority of researchers are deliberate choices made by teachers to implement a specific action (Clark & Peterson, 1986). Previous classroom research has reported 28.3, 22.2, and 24.1 interactive decisions per lesson by Marland (1977), Shroyer (1981), and Wodlinger (1980), respectively). Lessons were 60 min, 45 min and 35 min in length. In the present study, the results are similar to those of classroom studies (Clark & Peterson, 1986), with teachers averaging approximately one interactive decision every 2 min for lessons of 30 and 40 min durations. Differences were not observed for frequency of decisions reported by experts and novices, with experts averaging 24.6 decisions per lesson and novices averaging 26 decisions per lesson. Clearly, these data suggest that regardless of the setting, classroom or gymnasium, or teacher expertise, teaching is a cognitively demanding task.

Various models have been advanced by researchers to explain teacher interactive decision making. Shavelson and Stern (1981) suggested that teachers make deliberate actions when their routines are interrupted. Earlier explanations (Peterson & Clark, 1978) implied that decisions are made primarily when the teacher views the

lesson as going poorly. Shroyer (1981) maintained that teachers make decisions or elective actions based on student occlusions. A student occlusion was defined as a student difficulty or unexpected performance. However, the high frequency of interactive decisions within individual lessons that have been reported in classroom research, for example, 24 decisions in 35 min (Wodlinger, 1980), would argue that any single explanation appears to be too limited in focus. In fact, Calderhead (1981) maintains that these models are overly constraining in that they assume student behavior to be the only antecedent condition for teachers' interactive decisions. Recently, Clark and Peterson (1986) supported Calderhead's claim and stated that before specifying a model for teacher interactive decision making, more descriptive research is needed.

Antecedents of Teachers' Interactive Decisions. Teachers in the present study were found to make decisions based on a variety of factors which included but were not limited to interruptions in routines, student occlusions, and negative feelings toward the way the lesson was going. Differences between expert and novice teachers' antecedents to decisions were observed. Experts based decisions primarily on observations of student skill performance (44%). This finding supports Shroyer's explanation of student occlusion as a basis for teacher decisions. In addition, it supports the finding from Phase 1 of this investigation regarding expert teachers' sensitivity to individual needs of students. Frequently, during the videotaped lessons, the expert teacher provided individual assistance to those students experiencing skill difficulty. Only on isolated occasions was this observation made with novice teachers.

The findings also agree with results from Housner and Griffey's (1985) study of experienced and novice physical education teachers and Howell's (1987) investigation of expert physical education teachers. The experienced teachers in Housner and Griffey's study and those in Howell's investigation reported performance cues most frequently as antecedents to decisions (35.71% and 49.8%, respectively). In contrast, novice teachers in the present study based decisions on student skill performance only a small percentage of time (5.8%). Novice teachers in the Housner and Griffey study reported skill performance at a higher percentage (28.13%) but to a lesser degree than student request to change activity (76.92%) and maintaining student interest (28.13%). The larger percentage of decisions based on skill performance found by Housner and Griffey could be due to contextual factors (i.e., only four students per teacher in a laboratory setting). When inexperienced teachers in the present study were placed in the natural school environment with 25 or more students to manage, the primary basis for decisions during instruction was on procedures for organizing the lesson and on pacing of the lesson (17.3% each); in other words, when they viewed the lesson was going poorly. This supports the early model by Peterson and Clark (1978) of teacher interactive decision making. Other antecedents for decisions by novice teachers in the present study were alternative strategies and procedures for managing students (15.4% each), followed by maintaining pupil attention (13.4%), instructional procedures (5.8%), teacher recall of previous experiences (3.9%), negative teacher feelings (e.g., "I was aggravated so I decided...; I was disgusted..."; 3.9%), and teacher expectation of student behavior (1.8%).

Other than skill performance, antecedents for decisions for expert teachers were limited to maintaining pupil attention (31%), pacing of the lesson and alternative strategies (8.3% each), teacher recall of previous experiences and pupil attitude (4.2% each).

Focus of Interactive Decisions. As indicated in Table 3, differences were observed for expert and novice teachers regarding supplementary and plan-related decisions. Supplementary decisions are those where teachers include activities that are not part of the original lesson plan. Expert teachers changed or incorporated new activites during instruction much more frequently than novice teachers (experts = 20.3%, novices = 1.3% of decisions categorized). Additionally, expert teachers constantly made adjustments to lessons from class period to class period. They indicated that by the end of the day, instructional activities had improved based on the changes implemented. In fact, these changes often caused them to re-teach portions of the lesson to the early hour classes. At the end of class periods, the experts were jotting notes of these changes in their grade books. These notes served as reminders for the subsequent daily lesson.

In a study on teacher planning which involved junior high school physical education teachers, Goc-Karp and Zakrajsek (1987) reported that teachers were generally unwilling to change plans during the lesson. Even though these teachers indicated they were dissatisfied with the lesson, they preferred delaying interventions until a later time. However, the teachers in the Goc-Karp and Zakrajsek study were not classified by experience or expertise. The data presented in the present study suggest that expert teachers are more willing and able to

implement supplementary changes to enhance instruction than novice teachers.

The novice teachers based decisions on prepared daily lesson plans more frequently than expert teachers (novices = 35.9%, experts = 8.1% of decisions categorized). For example, one novice teacher had four soccer drills planned for one of the videotaped lessons. Although students were able to master the first drill in a matter of minutes, she decided she could not proceed to the next drill until the 12 min allotted time period had elapsed because that was the way her lesson was planned. Further, although the videotaping occurred during a fourth hour class period, which provided her ample time to execute adjustments based on earlier student performances, she did not make alterations. She revealed in her interview that she was aware of student boredom and "ancyness" sic but didn't know what else to do in that case.

Both expert and novice teacher groups focused their decisions during instruction primarily on characteristics or behaviors of the learners (experts = 67.6%, novices = 51.3% of all decisions categorized). This finding is consistent with results from classroom studies (Colker, 1982; Conners, 1978; Marland, 1977; Moline-Dershimer & Joyce, 1979; Parker & Gehrke, 1986) and from physical education (Housner & Griffey, 1985; Howell, 1987).

Teacher Interactive Concerns

There were striking differences between expert and novice teachers regarding their concerns during instruction (see Table 3). Novice teachers most frequently reported concerns related to the implementation of the lesson (64.4%) as opposed to pupil-related thoughts (35.6%). In direct contrast, experts reported a high

percentage of pupil-related concerns (88%) and only a small portion of time was spent thinking about the implementation of the lesson (12%). The most salient concern for novice teachers in this study was in the organization of activities and drills for instruction (23.4%) followed by maintaining pupil attention (22.1%), procedures for managing student misbehavior (18.6%), the pacing of the lesson based on original lesson planning (11%) and instructional procedures (9%). A total of only 6.2% of thoughts expressed by novice teachers focused on pupil learning. Further, only a small percentage of thoughts revealed concern for feelings that students were experiencing during instruction (pupil attitude, 3.8%).

In comparison, expert teachers expressed greatest concern for pupil learning (38.2%) while instructing the lessons. Within this category, concern for learners' ability to execute a task was deemed most important (procedural knowledge, 17.5%), followed by concern for learners to understand basic concepts and facts (declarative knowledge, 14.3%). Expert teachers also indicated that focus during instruction was on maintaining pupil attention (29%) and on feelings that students were experiencing (pupil attitude, 14.3%).

Differences in plan-related pacing of lesson were observed between experts (3.7%) and novices (11%). Novices were more concerned with the timing of their lessons based on their original lesson plan. To illustrate a typical response of novice teachers related to pacing, the following excerpt from an interview is provided:

> Interviewer: What are you thinking at this point in the lesson?
>
> Novice: I'm beginning to get that restless feeling. I start getting restless because they're

not doing what they're supposed to and it just, kind of, I'm beginning to get restless about it, so I'm starting to think "Change the drill", but is it time though?

Thus, the novice contemplated implementating a change because the activity did not seem to be going well but did not act on this feeling, because the drill had been planned to be executed in a certain time frame. As reported earlier, experts made on-the-spot adjustments to lessons.

Another example of different concerns expressed by expert and novice teachers involved the "busy, happy, good" concept (Placek, 1983). Several stated concerns of novice teachers focused on "just keeping the student busy" rather than actively engaged in skill at appropriate level. On the other hand, although the videotapes of the expert teachers clearly demonstrated that their students were indeed, "busy, happy and good", their comments during interviews did not indicate that this was a specific concern.

The preoccupation of the novices with keeping students busy was reflected in their interviews with such statements as:

Interviewer: What are you thinking at this point in the lesson?

Novice: just to keep them busy; that's my purpose at all times.

Novice: I like to keep students busy...what I've noticed if they keep busy, they're out of trouble.

Another example of a novice teacher's concern with student involvement is evident in the following excerpt:

Interviewer: What are you thinking at this point in the lesson?

Novice: I was thinking about trying to say something to get them involved, but then I just...it passed so quickly...I should have said something. But if I spent every bit of time trying to get those kids that won't participate right actively involved nobody would be participating, so I just leave them alone, if I didn't nobody would have a chance to participate, I'd be fussing all the time.

In contrast, experts expected students to behave and be interested and pleased with class activities. As will be demonstrated in Phase 4 of this investigation, expectations were conveyed to students during the first days of the school year and experts maintained the same high expectations throughout the year.

Teacher Interactive Awarenesses

There were notable differences between expert and novice teachers in their reported awarenesses of principles of teaching and alternative strategies (see Table 3). Experts evidenced a greater awareness of effective principles of teaching (21%) than novices (2.5%). The following excerpt is an example from the interview transcripts:

Interviewer: What were you noticing at this point in the lesson?

Expert: I was noticing this one little girl wasn't paying attention...she was looking at Monica..she was not giving me eye contact and I didn't mention it to her at this time, but when we broke into small groups I individually went up to her and told her that it was rude, you know, not to pay attention and you know, not to be looking at

the board or up where I was standing there....
Interviewer: And that approach works for you?
Expert: for the most part. When you don't shame them and don't criticize them ...when you try to make them understand that it's wrong, that they can't learn unless they give their teacher their undivided attention you know, usually it reaches most of them...not all...but most of them.

Interviewer: What were you thinking at this point in the lesson?
Expert: At this point when students were circling up, there were a couple of problems and uh, I just let them calm down on their own rather than me trying to jump in there and uh, shut them off and get them in a frame of mind that they don't want to listen...if you, I find that if you raise your voice too much, they'll be quiet but they'll shut you out after awhile. I was just taking a moment to let them settle down because usually these children settle down...they don't want to waste their time..they want to participate...so I'm waiting; I'm looking for eye contact from them and less eye contact from each other.

These findings support those discussed previously in Phase 1 concerning the expert teachers' analyses of situations presented in the various scenarios. Those results also demonstrated greater knowledge in applying sound principles of teaching when presenting solutions to problems identified in each scenario.

Novice teachers reported more alternative strategies (69.6%) than experts (43.5%). This finding supports results from early studies of expert and novice chess

players (de Groot, 1965). The author reported that master chess players considered fewer alternatives than weaker players before choosing a move. Further, master chess players invariably explored strong moves, whereas weaker players spent considerable time analyzing the consequences of bad moves.

Differences similar to de Groot's findings can be demonstrated in the following excerpts of expert/novice alternative strategies considered in the present study.

> Interviewer: Right here at this point, when the students were jumping rope, what are you noticing?
> Expert: The individuals which were not doing the work more than those that were...I should have complimented those (like Kathryn) who were doing the work like I did in the exercises to help, you know, spur them on...but I didn't.

Another example of the responses of three of the experts concerning a similar teaching situation:

> Interviewer: Was there anything you thought of doing at this point in the lesson but decided against it?
> Expert: well, maybe taking Clarence and pulling him out and talking to him after class...
> Expert: well, possibly at this point I could have pulled him to the side and gotten another student to work with him where he would have some more practice time
> Expert: probably pull her out and go one on one to reemphasize the skill.

Responses from the novices to the same prompt reflect a much different focus of concern:

> Interviewer: Was there anything else you thought of doing at this point in the lesson but decided

against it?

Novice: Well, when I was choosing exercise leaders you saw how Richie wanted to jump in and do it, I thought about Dexter doing one and Richie doing one but then I decided against it..just let Dexter do it.

Novice: I had put Robbie out of the game on the side and I thought about putting Marcus out, too..but then that would have just been putting them away from me and I might not be able to catch it ...you know, if they started something ...

Novice: Well, I thought that after class I'd just have to have them do some punish work.

Novice: well, if I could have thought of another game to play I would have but I didn't have anything right off the top of my head. I thought of playing heads up but that's a slow game and not everybody plays. Half of them don't get picked. I wanted something where they would all get involved.

Novice: I thought about placing the students on their dots..we have little red dots out there and it's for that purpose..this is your dot, don't leave it, but that would have taken too much time ..that would have been mass confusion, so I didn't do it.

As illustrated, novice teachers spend considerable time analyzing the consequences of bad moves similar to weaker chess players in de Groot's (1965) investigations. The expert teachers, when compared to novices, provided "stronger moves" as alternate teaching strategies.

Intended Student Cognitive Processes

The responses to the interview question, "What do you want the students to be thinking?" revealed differences in expert and novice teachers' intended student cognitive processes. Responses by the novice teachers were primarily related to appropriate procedures (42.7%), followed by wanting students to pay attention to instruction (27.3%). Examples of procedural concerns include the following statements:

Interviewer: What do you want the students to be thinking at this point in the lesson?

...Just don't mess up, don't bother Coach B's class, don't stop at the water fountain...just go outside.

...Staying in their lines..stay in your straight lines, you know.

...Closing their mouths

...To get away from the desk

...To remember what I told them, you know,

...Just go to your position and stay there

...Not to touch the equipment

...To get to the end of the lesson

Only 24.7% of novice responses focused on pupil learning when responding to this interview question, and a very small portion related to pupil attitude (5.3%). Responses that did reflect pupil learning concerns were very general rather than specific. For example:

Interviewer: What do you want the students to be thinking at this point in the lesson?

...how to position the shotput

...the shotput, how to hold it

...pacing themselves

...the whole sequence about the shotput
...just to do it the right way
...I want them to be thinking just to do the correct kick the best they could
...to just run through, you know, not slow down
...I wanted them to try to remember back to what they had learned

In direct contrast, expert teachers responded to this question with primary focus on pupil learning (81.14%), followed by wanting students to pay attention during instruction (12.29%), pupil attitude (3.29%), procedures (2.46%) and pacing of the lesson (0.82%). Further, pupil learning statements were quite specific as opposed to the general statements made by novice teachers. The major emphasis of pupil learning was that of procedural knowledge (40.16%), with approximately equal weight given to strategic (21.31%) and declarative (19.67%) knowledge. Examples of pupil learning statements made by the experts include:

Interviewer: What do you want the students to be thinking at this point in the lesson?
...ready position, elbows locked, stepping into the ball, you know, all working to improve our skill
...to try to get the ball to the target, and the proper technique I had taught, mostly lock your elbows, bend their knees and not swing their arms, watch the ball...all the cues that you know, I had given them
...I want them to be thinking scoring, concentrate on when it's a strike..that the next two balls are important to count.
...that it's real important if I hit a strike or a spare to really try to do well when I get up to

throw the next ball..to concentrate on what I'm doing..getting the ball where I want it to go.. what kind of approach to take..how to hold the ball..bend my knees low..and finally, how to score what I've gotten

...using correct form in making the bounce pass, uhm, stepping with the correct foot, making sure the ball is bouncing at a...the right angle to have the rebound at the receiver's waist..looking at the direction they're going to throw ..make the pass

...using the correct defensive positioning--knees bent, back straight, arms out, uh, on the balls of their feet

These illustrations reflect pronounced differences in interactive teacher thoughts that are directly related to the student learning process. There were also a few statements concerning student approval which were unique to two of the novice teachers. On several occasions, statements such as "I just want the students to like me, you know, because I like them" were provided by two novice teachers. In addition, there were many instances noted in all the novice teachers' transcripts in response to this question relating to the "busy, happy, good" concept (Placek, 1983). For example:

...I just want them to be thinking it's fun

...Just to continue in the game and not get too loud. Inside, you just try to keep them busy.

...I just want them to be thinking they had fun in PE, because I want them to enjoy it. I did when I was their age.

Elementary and Middle School Interactive Thoughts

There were no observed differences between elementary and middle school teachers' concerns, decisions, antecedents for decisions, or awarenesses during the instructional phase of teaching. Further, there were no differences between the two groups for intended student cognitive processes. Only two sub-categories showed slightly different percentages for the two groups: alternate strategies (elementary level = 65.7%, middle school = 50.7%) and observation of skill performance (elementary level = 57.1%, middle school = 36.3%). Findings from classroom research are limited to elementary school instruction with the exception of one investigation (Norton, 1987). Using the same instrumentation as in the present study, Norton reported differences between elementary and secondary preservice teachers in regard to pupil-relating pacing, pupil attitude, and plan-related pacing.

From an examination of expressed concerns during interviews, it can be observed that middle school teachers expressed different management concerns related to the availability of limited space, particularly during inclement weather. These teachers had to share a gym space with three or more teachers and at least 90 more students, which is a common situation for any middle or high school physical education teacher. Therefore, they must think about and make decisions during instruction which involve concern with management in confined areas. Illustrations of this point can be demonstrated in the following excerpts from middle school teachers' transcripts:

> Interviewer: What are you thinking at this point in the lesson?

> ...I was noticing Coach A's class had come out on the court earlier than the other classes. I was upset that I was having to yell so loud and that the students were distracted by what was going on in Coach A's class.
>
> ...I had opened the door and I looked outside and Ms. H's class was in the parking lot..and I had just told my kids to go to the basketball court because I have a large class, but when I opened the door and saw her class there, I changed my mind and told them to line up behind Ms. H's class.

Conversely, the elementary teachers did not have to schedule activities around other physical education classes, and therefore, did not reflect the same kind of teaching concern. Even though this observation was noted, differences in percentages for the management category were not observed (elementary level = 11%, middle school = 13.1%). Similarly, differences in percentages for organizational procedures were not demonstrated (elementary = 13.2%, middle school = 16.3%).

Summary

Overall, the findings reveal substantive differences in expert and novice teachers' thoughts, concerns, awarenesses, and decisions during the instructional phase of teaching. The most pronounced difference concerns pupil learning. Due to the complexities of managing student behavior and organizing activities and drills which are new experiences for novice teachers, their major focus is to simply implement the lesson and hope it fits the time allocated for instruction. Until these

organizational and management techniques are mastered, they are unable to focus on student skill performance. Examples of organizational and management concerns of the novice teachers include: finding the best method to distribute equipment, selecting exercise leaders, exhibiting equality when choosing teams, making sure assigned members from one team do not sneak over to another team, keeping students in lines, keeping students away from equipment and supplies, designing acceptable lesson and unit plans, and coping with student misbehavior. They are also concerned with the approval of their supervising teacher and whether the students like them or not.

Conversely, expert teachers are confident in their methods employed to control student behavior, organize effective drills and activities, and implement efficient routines. Consequently, the expert teachers are able to focus their primary attention during instruction on individual skill attainment.

Phase 3

Student Perceptions of Instruction

Recent research on teacher thinking has revealed that a high percentage of teacher decisions and concerns are focused on the learner. In light of these findings it is important to study the link between teacher thoughts and behavior with student cognitions and perceptions of those actions. Research conducted thus far on students' thought processes and perceptions of lessons has examined the relationship between what children think, believe, feel, say, and do and their achievement (for a review, see Wittrock, 1986). Several researchers (Doyle, 1978;

Peterson, 1988; Winne & Marx, 1977) have argued for the need to broaden the conceptualization of effective teaching to include teachers' and students' cognition. Clearly, student thinking mediates learning and achievement and student action during instruction.

Students' perceptions of what is being taught is an important variable to consider since the instruction as perceived by the students may be different from what the teacher intended to be learned. An illustration of this point was given by Thomas (personal communication, 1984). When he asked his daughter, age 3, how high she could count, she stood up on the couch and extended her arm above her head and began to count. Obviously, the words "how high" held different meanings for the teacher and the learner. How frequently is this situation experienced in the classroom or gymnasium in which there are at least 20 or more children?

A number of classroom studies have assessed the effects of students' thoughts on achievement (Peterson, & Swing, 1982; Peterson, Swing, Braverman, & Buss, 1982; Peterson, Swing, Stark, & Waas, 1984; Stayrook, Corno, & Winne, 1978; Winne, & Marx, 1982, 1983; Wittrock, 1978; 1986). Findings have indicated that achievement is predicted by the more specific student cognitive strategies rather than general strategies. These results imply that through the examination of student thought processes effective learning strategies used by students can be identified. In one of the classroom studies (Winne, & Marx, 1982), students' and teachers' views of thinking processes in upper elementary and seventh grade classroom lessons were investigated. Lessons were videotaped, and SRI procedures were employed with both students and teachers. Teacher interviews were designed to obtain an account of what the teacher intended the

student to be thinking while student interviews described what they were actually thinking during instruction. Findings revealed a noticeable lack of one-to-one correspondence betwen what teachers had intended students to be thinking and the cognitive processes that actually occurred. Practically speaking, if teachers do not come to grips with the possible dichotomy between how they are teaching and their students' perceptions of their instruction, optimal learning may be difficult to achieve.

There have been no data reported concerning student perceptions of expert and novice teachers' lesson in education or physical education. It is therefore the purpose of this phase of research to examine student perceptions of the instruction of expert and novice physical education teachers. Further, comparisons of the teachers' desired student cognitive processes will be made to actual reports by the children.

Method

Subjects

Teachers. Subjects were the same eight teachers described in Phases 1 and 2.

Students. A total of 144 students served as subjects. Students were either at the third (n = 72) or seventh grade (n = 72) levels. Six students per teacher for each of the three lessons were randomly selected to participate in an SRI. The teachers were asked to identify students as either low-skilled, average, or high-skilled in regard to physical performance. In the case of the novice teachers, the supervising teachers were asked to provide this ranking of student skill level.

Thereafter, of the six students per interview, two from each skill level were randomly selected to participate. This procedure was chosen simply to ensure heterogeneity of the samples with regard to skill level.

Procedures

Stimulated Recall Interview. During the teacher SRI, each teacher was asked what he or she had in mind for the students to be thinking during instruction. The day following the videotaping and SRI of the teacher, students were interviewed to assess their perceptions of the lessons.

A structured interview procedure was followed. At the beginning of the interview, the investigator expressed the importance of the project and assured students that they could answer honestly without fear of any punishment. When the investigator felt that directions were clear and students felt comfortable, the SRI began.

The videotapes were viewed by the students and stopped at the predetermined points in the lesson that were established by the teacher in the interactive interview. After students observed the segment, the interview proceeded. One child served as a "target student" to begin questioning, and then a rotation process was employed with other students responding to the same question. The next question started with a different "target student", and procedures continued, until every child had the opportunity to be the first one to respond. The process continued until the completion of the interview. This procedure was used to obtain a full spectrum of responses from the students with the greatest possible efficiency.

Analysis of Interviews. Students' responses to the SRI were audiotaped and transcribed for analysis. An inductive process was used to develop a coding system. Typed protocols of students' thoughts were examined line-by-line, and logical categories were permitted to emerge from the data to address the three major concerns:

1. What are students thinking about during instruction in physical education?
2. What ways do physical education teachers help students to learn?
3. Do students think there is a better way to learn activities?

The conceptual basis for selecting the categories was derived from a coding system used by Peterson, et al., (1982) in a study of student thoughts during mathematics instruction. Definitions for categories are presented in Table 5.

Insert Table 5 About Here

Two researchers classified the thoughts of students in the classes of the expert and novice teachers according to the coding system. The frequency of each specific category for the two groups of students was computed by counting the number of times a category was mentioned by the students across the 3 interview days. The students had to express thoughts in their own words to be included in the analysis. Therefore, statements such as "same as Johnny" or simply, "same thing" were not included in the cumulative frequency.

Intercoder agreement for the student coding system was established by two researchers by independently scoring a sample of the interview transcripts. An interrater agreement coefficient of .97 was attained for

the total interview. Coefficients for the subcomponents ranged from .75 to 1.00. Intrarater agreement for the total instrument was .99; the coefficients for the subcomponents within each broad category ranged from .83 to 1.00. Interrater and intrarater agreement in interviews at the beginning, middle, and end of data analyses were examined to protect for experimenter drift.

Results and Discussion

Focus of Student Perceptions of Expert and Novice Teachers' Lessons

There was only a slight difference in total frequency of statements recorded for students of expert and novice teachers when responding to the interview question, "What are you thinking at this point in the lesson?", with students of expert teachers reporting 414 thoughts during instruction and novices, 387 thoughts.

As shown in Table 6, a similar trend was noted in the responses of the two groups of students as to general categories of thoughts during instruction with the primary focus on affective thoughts, followed by skill-related thoughts, comprehension of instruction, and off-task thoughts. Only a small number of children responded that they could not remember what they were thinking. Although a similar trend was evidenced in general categories for the two groups of students, the frequency and focus of thoughts for these categories were substantially different for the two groups of students.

Insert Table 6 About Here

Affective Thoughts. The most prevalent affective thoughts of the students of the novice and expert teachers were concerned with motivating themselves to accomplish the task. These results support findings reported by Peterson et al. (1984) of students' thoughts during mathematics instruction. However, frequency of reported "motivating self" statements was notably different for the two groups of students in the present study (students of experts, n = 87 statements, or 42.4%; students of novices, n = 54 statements or 21.7%). Thus, students of expert teachers more frequently reported thoughts such as, "I was trying to do it right", or "I was trying to do my best". The next most frequently occurring affective thoughts for students of novice teachers reflected negative feelings toward the activity, instruction, or situation, followed by thoughts of self or team assessment. In contrast, students of expert teachers expressed more positive feelings toward the teaching situation, followed by self or team evaluation of performance. Thus, both groups of students, particularly when watching the teacher demonstrate or explain an activity, were thinking of how they would perform the task when it got to be their turn.

Students of expert teachers only expressed 12 negative feelings about the situation. Not only was the quantity of negative statements different, but also the content. Most of the 50 negative statements made by students of novice teachers pertained to misconduct of students, boredom, or questioning the relevance of the activity. For example, from the interviews of students of novice teachers:

> Interviewer: What are you thinking at this point in the lesson?
> Student: I was thinking why did we have to go

through kicking the ball and stuff when really you knew how to kick the ball.

Student: I was thinking that the kids should be a little more quieter, because I couldn't hear what she was saying.

Student: I thought it was going to be fun, but it was boring.

Student: If everybody would have been listening I wouldn't have to be doing the shuttle run again cuz she wouldn't have to pay attention more to them than the stop watch.

In comparison, most of the 12 negative statements expressed by students of expert teachers concerned skill performance of teammates or assigned partners within group activities. For example, from the interviews of students of expert teachers:

Interviewer: What are you thinking at this point in the lesson?

Student: Sometimes the boys (on my team) got in the way and I didn't like it.

Student: Jeremy and them...they were throwing too short...they weren't jumping or nothin' .. they were just standin' like this...letting the ball pass by.

Only one statement from a student of an expert teacher referred to student misbehavior. Other negative statements from students of expert teachers were in reference to particular exercises (e.g., dislike of squat thrusts; student did not want to jump rope). Since there was relatively no student misbehaviors occurring in the

expert teachers' classes, there was no need for students to be thinking along those lines.

Another difference observed for the two groups of students was in student thoughts of winning, with students of novice teachers expressing slightly more concern than those of expert teachers.

Skill-Related Thoughts. There were observed differences in frequency of thoughts related to skill performance, with students of expert teachers expressing more skill-related thoughts (n = 94) than students of novice teachers (n = 52). Further, students of expert teachers reported more thoughts regarding specific skill technique or game strategy. These findings suggest that expert teachers stimulated students to be thinking about the specific processes involved in skill performance more than novice teachers. It also reflects the differences in the amount of time students actually spent engaged in skill activity. Because the novice teachers spent more class time engaged in organizational and routine tasks, their students did not have as much opportunity to participate in skill activities.

Comprehension of Instruction. Students of novice teachers expressed confusion during instruction to a greater degree than students of expert teachers (see Table 6). Most of the confusion was related to instructional routines, procedures and organization. The students of novice teachers reportedly did not know where to go and what to do during portions of instructional time. For example, from interviews of students of novice teachers:

> Interviewer: What are you thinking at this point in the lesson?
> Student: I didn't know what was going on.
> Student: I didn't know what to do...I thought we

going to run around the gym two times.

Student: He didn't tell us what to do, so I thought we were going to be doing exercises.

Student: I was thinking are we all going to be in the same group?

Student: I was thinking was I going to go and get to do the kicks?

Student: I was thinking what are we going to do for pe?

In contrast, students of expert teachers spent more time thinking about the general concepts being taught. Additionally, the students of expert teachers reported using specific cognitive processes to comprehend lesson content, whereas none of the students of novice teachers reported using such strategies. For example, from interviews with students of expert teachers:

Interviewer: What are you thinking at this point in the lesson?

Student: I was thinking that he wanted us to see how much blood we were pumping.

Student: He was showing us how it (heart rate) would change after we did aerobics.

Student: I was thinking we were doing the steps (in the aerobic dance) so your heart can beat more faster.

Student: I was thinking about how to.., uh, make sure I was adding correctly to get the right score and everything like that.

Classroom research relating student thought processes to achievement (e. g., Peterson et al., 1984) has

indicated that students reporting specific cognitive processes performed better on achievement tests.

Another observation pertaining to student confusion is pertinent here. There was approximately the same number of responses concerning confusion regarding cognitive concepts by students of both expert and novice teachers (students of novices, n = 10, or 22.7%; students of experts, n = 11, or 14.1%). However, it was revealed later in the interviews that the expert teachers were able to clarify the points of confusion, whereas the students of the novice teachers remained confused throughout the lesson. The following excerpts from an interview with a student of an expert teacher illustrate this observation:

> Segment 1 of Interview: Teacher is explaining scoring for the first time in the bowling unit.
> Interviewer: What are you thinking at this point in the lesson?
> Student: Thinking about how you do the score.
> Interviewer: Do you understand how to do it?
> Student: I was confused.
> Interviewer: What about it didn't you understand?
> Student: I just didn't understand what she was saying.
> Segment 2 of Same Interview: A study guide was distributed to students which provided a sample scoring problem.
> Interviewer: Were you understanding at this point?
> Student: Yes m'am.
> Interviewer: What was it that Ms. XX did to make it clear to you?
> Student: When she went to the board and started going over it, it helped me to understand.

In contrast, the following illustration is from an interview with a student of a novice teacher:

> Segment 1 of Interview: Teacher is explaining player positioning in a soccer unit to the students.
> Interviewer: What were you thinking at this point in the lesson?
> Student: I didn't want to be wearing that green thing (the green jersey for dividing teams).
> Segment 2 of same interview: Students are assigned player positions on the playing field.
> Interviewer: What are you thinking at this point?
> Student: I was confused because I didn't know anything about soccer and really I still don't know anything---I still don't know what I'm supposed to do in soccer.
> Interviewer: What could the teacher have done to make it more clear to you?
> Student: When she's trying to explain directions, everybody shouldn't be talking and stuff...more discipline.
> Segment 3 of same interview: Students are playing the game in their assigned player positions.
> Interviewer: Did you understand your playing position at this point in the lesson?
> Student: No.
> Interviewer: What could the teacher have done to help you understand?
> Student: I could have asked the teacher, but she was so busy.

Thus, although students reported equal numbers of confusion regarding concepts, it was observed that the

expert teacher was better able to resolve misunderstandings.

Teacher-Intended Student Cognitive Processes. Results from Phase 2 revealed differences between expert and novice teachers in their responses to the question, "What do you want the children to be thinking?". The expert teachers were primarily concerned with pupil learning, while novice teachers emphasized appropriate procedures. Students of expert teachers were more often engaged in the understanding of the concepts and skills being taught. While the novices reported concern for pupil learning only a small portion of time, their students did not focus on learning to the extent of the students of experts. Accordingly, one might imply that both groups of students did, indeed, match with the teachers' intended thoughts. However, to illustrate what children were thinking when the teachers from both groups reported an intended learning statement, the following excerpts are given. For example, from interviews of the middle school expert teachers and students:

> Interviewer with Expert Teacher: What do you want the students to be thinking at this point in the lesson?
>
> Teacher: I'm trying to get the kids to think about passing the ball (volleyball) to the front row instead of over the net, and trying to get them to play with teamwork and so I use the court so they can understand basically what they're doing. I have the three back row people marked, and then I have this big spot in the front. I even had the net up, even though I could have done

this drill without the net; just to show the relationship in the court and what they're trying to do. I want them to be thinking about the technique for the forearm pass, and where do I want the ball to go.

Interviewer with Students: What are you thinking at this point in the lesson?

Student: I was trying to get the ball to the net, to the person trying to catch it.

Student: I was thinking you were supposed to say here I am--that you were supposed to keep your elbows locked and be correct and everything and at least try to get it in the area and if not you'd get an extra chance.

Student: I was thinking to learn to play ...so you wouldn't be like jungle ball and have to hit it over by yourself, you could pass it to the first person and they could try to hit it over.

Student: I was thinking to cooperate and have good teamwork.

Student: It makes the game more exciting when you have three hits instead of just one, because, you know, nobody else can play the ball.

Student: Yeah, she had the three lines back there because in the game you have the three back positions and she's showing you where to hit the ball.

Interview with Expert Teacher: What do you want the students to be thinking at this point in the lesson?

Teacher: I want them to be thinking about proper bowling etiquette..you know, not running across the lanes and run in front of the ball or anything, and my main thing is for them to learn to score here..and use the proper four-step approach and form.

Interviewer with Students: What are you thinking at this point in the lesson?

Student: Uhm, thinking about how many steps to take to bowl and stuff and where to stand like she had told us.

Student: well, all I was really thinking about doing was to see how many steps to take and how to throw the ball and stuff and I think I did okay.

Student: I was thinking about how I was supposed to behave and stuff so we'll have enough time to bowl a lot of games...like she said she wanted us to be able to bowl a lot of games and everything.

Student: I was thinking about making me some strikes.

Student: I was trying to concentrate so I could make some strikes and spares.

Student: I was thinking about the score...we got three spares in a row and me and this girl were thinking about how to add it up and stuff, so we asked her how to add it up and she explained it to us.

In comparison, when the novice teacher reported that they wanted the student to be learning a particular skill or concept, their students were not cognitively engaged in that thought in the same way as the student of the expert

teacher. For example, from interviews of the middle school novice teachers and students:

> Interviewer with Novice Teacher: What do you want the students to be thinking at this point in the lesson?
>
> Teacher: Uhm, when I would tell one person use the inside of the foot, not your toes...kind of subconsciously hoping it's getting in there somewhere, "when I get up there, I'll use the inside of my foot, and not my toes".
>
> Interviewer with Students of Novice Teacher: What are you thinking at this point in the lesson?
>
> Student: What team I was on.
>
> Student: What team I was going to be on...with my friends, like Jason.
>
> Student: I was thinking that the kids should be a little more quieter, because I couldn't hear what she was saying.
>
> Student: I wanted to be on my friend's team so we could be the best team and win the relay.
>
> Student: I was thinking about kicking the ball to the cone and then where do you bring it back...straight down the line or in and out like going up there?
>
> Student: I was thinking why did we have to go through kicking the ball and stuff when really you knew how to kick the ball.
>
> Interviewer with Novice Teacher: What do you want the students to be thinking at this point in the lesson?

Teacher: Uhm, how they're supposed to hold the shotput (softballs were used in the lesson to teach the shotput techniques).

Student: I was thinking that we were going to throw the ball.

Student: I was thinking that they (the student helper) should, you know, try to pass the balls out in a hurry so we could get through with this.

Student: I was thinking how far was I going to throw the ball.

Student: I wasn't thinking...I was thinking... but I was in the back clowning...to tell you the truth.

Student: I was thinking that we're going to start this soon and to get the feel of the shotput, you have to do it with a softball first.

Student: I was thinking was he going to let us throw the balls?

Consequently, there was a noticeable lack of one-to-one correspondence between what the novice teacher intended the student to be thinking and what actual thoughts occurred. The differences in these thought concepts were illustrated throughout the interview transcripts. In order to determine to what extent the two groups of students were engaged in task-relevant thought processes, those categories which illustrated positive thoughts were identified. These categories were: positive feeling toward situation/activity/teacher, motivating self, self/team assessment, attending, remembering, general cognitive concept, specific cognitive concept, general skill technique and specific skill

technique (see Table 6). These categories are consistent with variables put forth by motor learning researchers as affecting learning of motor skills (e.g., see Schmidt, 1982). Frequencies of those thoughts by students of expert and novice teachers were compared.

Total frequency of the positive thoughts by students of expert teachers was much greater than those by students of novice teachers (students of experts, n = 302/414 or 72.9%; students of novices, n = 175/387 or 45.2%). Thus, students of experts were engaged in task-relevant or positive cognitive processes for the majority of instructional time (three-fourths of the lesson), whereas students of novice teachers spent less than half of the instructional time engaged in positive cognitive processes.

Reports of Teaching Processes

Table 7 presents results from student responses to the interview question, "What are the things the teacher did to help you understand (the activity) at this point in the lesson?". There were differences in total number of responses by students of expert and novice teachers, with more responses by students of expert teachers (students of experts, N = 244; students of novices, N = 128). According to the student responses, the expert teachers used multiple techniques to a greater extent than the novice teachers. For example:

> Interviewer: What are the things the teacher did to help you understand?
> Student: He demonstrated and told me what to do and like if I made a mistake, he came by and helped me correct myself (individual feedback).

Student: She kept going over it a lot (review) and also when we were serving if you missed it the first time, she would come and help you get in the right position and help you (individual feedback) serve it again.

There was also a greater variety of teaching processes indicated by students of experts, whereas students of novices reported explanation and demonstration in three-fourths of their responses (combined n = 76.6%). These findings support results of classroom research (Peterson et al., 1984) in which the students reported that their teachers explained the material, provided examples, and "helped them". In the present study, if students responded by simply stating, "the teacher helped me", a follow-up question was asked, "how did the teacher help you?". Although explanation, followed by demonstration were also the most prevalent teaching processes noted by students of experts, these students reported that their teachers also provided individual feedback and "broke the skills down" in a step-by-step (task analysis) procedure to a greater extent than was observed by students of novice teachers.

Insert Table 7 About Here

Student Thoughts for Improving Instruction of Expert and Novice Teachers

Responses to the interview question, "Is there a better way to learn this activity...If you were the teacher how would you have taught this activity?" are

presented in Table 8. There were fewer responses to this question by students of experts (N = 147) than by students of novices (N = 178). As in the case of multiple thoughts provided by students of expert teachers when answering the question about ways teachers helped them learn, students of novice teachers often provided multiple suggestions in response to ways to improve instruction. For example:

> Interviwer: Can you think of a better way to to learn this activity?
> Student: Yeah, first I'd make everybody be quiet (better class control) so you could go over the soccer rules and then I'd have put a defensive player on so you could learn to dribble and learn how to play defense (change activity) and kill two birds with one stone.

The most frequent response by students of both groups of teachers was "no change in lesson". However, the frequency of this response was notably different, with students of experts expressing this more often (students of experts, n = 82 or 57.7%; students of novices, n = 48 or 26.2%). For students of expert teachers the next most frequent suggestion was changing warm-up exercises, followed by changing drills or lesson activities. For students of novice teachers, suggestions for changing drills or activities, as well as changing routines, changing warm up exercises, having better class control, and providing better explanations and/or demonstrations were frequent responses. There were no statements made by students of expert teachers indicating a need for better explanations and/or demonstrations, providing more practice or providing more feedback. Further, only one statement was made suggesting better class control.

Insert Table 8 About Here

Focus of Elementary and Middle School Students' Perceptions of Physical Education Instruction

There was a slight difference in total frequency of statements recorded for elementary and middle school students when responding to the interview question, "What are you thinking at this point in the lesson?", with elementary students expressing 449 thoughts and middle school students reporting 352 thoughts.

Affective Thoughts. As shown in Table 9, students at both age levels reported more affective thoughts (elementary, n = 251; middle school, n = 202) during instruction than any other category. Elementary students' next most prevalent concerns were skill-related thoughts (n = 74, or 20.9%), followed by comprehension of instruction (n = 61, or 13.6%), "I can't remember" or no reply (n = 22, or 4.9%), off-task thoughts (n = 15, or 3.4%), and social thoughts (n = 6, or 1.3%). Middle school students' most frequent concerns following affective thoughts focused on comprehension of instruction (n = 61, or 17.3%), followed by skill-related thoughts (n = 52, or 14.8%), off-task thoughts (n = 9, or 5.4%), social thoughts (n = 15, or 4.3%) and "I can't remember" or no reply (n = 3, or .8%).

Insert Table 9 About Here

Substantial differences were observed in student affective thoughts regarding negative feelings about the

instructional situation, motivating self, wanting to get done, self/team assessment, and winning. Middle school students expressed more negative feelings and "wanting to get done". In contrast, elementary students reported a greater number of thoughts of "motivating self" to do the task well, were more concerned with their ability to perform the task and concentrated more on winning.

Comprehension of Instruction. Only slight differences between elementary and middle school students were observed on the percentage of thoughts related to lesson comprehension. Elementary students were confused regarding skill performance to a greater extent than middle school students. Conversely, middle school students expressed more confusion related to cognitive concepts.

Other Differences. There was substantially more skill-related thoughts expressed by elementary students (n = 94) than by middle school students (n = 52). Elementary children were engaged in more thoughts related to general skill as well as specific skill technique than middle school students. Elementary students could not remember what they were thinking during instruction more frequently than middle school students. Middle school students expressed more social thoughts, that is, thoughts of friends, boyfriends and girlfriends, more than elementary children.

For total positive thought processes (i.e., positive feeling about situation, motivating self, self/team assessment, attending, remembering, general concept, specific concept, general skill technique, and specific skill technique), differences were observed for the two groups of students. Elementary students reported these positive thought processes more frequently than middle school students (elementary, n = 304/449 or 67.7%; middle

school, n = 173/352 or 49.1%). Thus, elementary students were engaged in positive thought processes for about two-thirds of the instructional time, whereas middle school students were only engaged in positive thought processes for slightly less than half of the time.

There were relatively no differences between elementary and middle school students when responding to the questions, "How did the teacher help you understand the activity" and "Is there a better way to learn the activity", except in total number of reported statements. Elementary students expressed more teaching processes (N = 221) that assisted them in understanding the lesson content than middle school students (N = 151). Both groups responded that teacher explanation, followed by demonstration were most beneficial. Middle school students provided more suggestions for ways to improve instruction (N = 185) than elementary students (N = 140). The majority of responses for both groups suggested no change in the lesson (elementary students = 47.9%, middle school students = 34%). Middle school students suggested changing routines to a greater extent (n = 25, or 13.5%) than elementary students (n = 3, or 2.1%). Both groups of students recommended changing warm-up exercises as their primary suggestion for lesson improvement.

Summary

Overall, the findings from interviews of student perceptions of physical education instruction revealed differences in the way students of expert and novice teachers view the lessons. Students of expert teachers spend more class time thinking about skill performance and concepts being taught than students of novice teachers. Further, they expressed less confusion regarding

procedures, routines or their own performance of skill-related activities. Although the amount of confusion with regard to cognitive concepts was similar for the two groups, expert teachers were able to clarify misunderstandings, whereas students of novice teachers remained confused.

Students of expert teachers expressed a greater number and variety of thoughts related to the ways teachers help them learn the lesson content than students of novice teachers. Students of expert teachers also made fewer recommendations for improving instruction. Students of novice teachers reported more negative feelings of the teaching situation, while students of experts perceived the lessons in a more positive way.

Middle school students perceived physical education more negatively than the elementary students. Conversely, the elementary children spent more class time appropriately engaged in positive cognitive processes.

Taken together, students most frequently reported affective thoughts during physical education instruction, regardless of age level or expertise of the teacher.

Phase 4

Rules and Management Routines

The most consistently replicated findings of research on teaching have linked students' achievement to their opportunity to learn the material (Brophy, 1986). Engagement rates depend on the teacher's ability to organize the classroom into an efficient learning environment where activities run smoothly, transitions are brief and orderly, and little time is spent in organization. If routines are well established, students

will have more opportunity to learn. The successful teacher reduces the complexities of the learning environment by establishing rules and management routines which allow instruction to proceed in a focused way (Brophy, 1987; Doyle, 1986; Leinhardt et al., 1987).

Findings from classroom research have shown that the first days of a school year are extremely important in establishing and routinizing procedures. It is during this time that rules are announced and enforced (Clark, & Elmore, 1979; Clark, & Peterson, 1986; Emmer, Evertson, & Anderson, 1980; Evertson, & Anderson, 1981), and routines are rehearsed (Leinhardt et al., 1987; Pittman, 1985). Routines can be defined as activities which become automatic to help simplify the environment for both teachers and students, whereas rules prohibit certain behaviors from occurring. The first day of school has always been considered vitally important. In 1907, in a classic text of classroom management, William Bagley states:

> The first day should leave with the pupils a distinct impression that work has begun in earnest, that no time has been frittered away, and that something definite has been accomplished (p. 29).

Three entire chapters in Bagley's book are devoted to establishing and mechanizing class routines for efficient classrooms. His recommendations included the establishment of routines for: passing of lines; fire drills; signals; passing to the blackboard; passing to the recitation bench; distributing and collecting wraps, books and materials; leaving the room; and for neatness of written work and blackboard work. Interestingly, recent studies (e.g., Leinhardt et al., 1987) still advocate many of these as important routines to establish.

Many classroom routines do not apply to the physical education setting since the gymnasium or playground is a more dynamic and open environment than the classroom and involves different supplies and equipment. In addition, because of the increased student activity and movable equipment, concerns for student safety during instruction are more likely to affect many of the rules and routines established by the physical education teacher. One of the most difficult tasks the new beginning teacher encounters is to establish effective rules and management routines. Examining the ways in which experts perform these tasks at the beginning of the school year should provide the novice teacher added insight into the teaching process.

The specific purposes of this phase of research were to (1) identify rules, activity structures, and management routines that were developed by two expert teachers during the first 5 days of class; (2) describe the actions of the teachers as the rules and routines were established; (3) describe when and how disciplinary actions were taken; and (4) determine it rules and routines were maintained throughout a semester.

Method

Subjects

One expert elementary teacher (EE-1) and one expert middle school teacher (EM-1) were selected for study. These two were selected randomly from the four experts chosen for this research project. Detailed biographical data for each teacher are provided in the section which describes the procedures used by the teachers in establishing rules, routines and disciplinary actions at the beginning of the school year.

Procedures

Teachers were videotaped during the first 5 days of the school year. The videotapes were then analyzed to identify rules, activity structures and supporting routines used in the lessons. Activity structures are defined as small segments of the daily lesson. The investigator and two other researchers used an inductive, categorical analysis procedure (Glaser, & Strauss, 1967; Goetz, & LeCompte, 1984; Yinger, 1978) based on the work of Leinhardt et al. (1987) to define activity structure and routine.

The videotapes were studied and records were made of classroom events and procedures, noting the rules, activity structures and routines occurring during the 5 days. The activity structures and routines were then sorted into major categories with detailed definitions for each category. This initial identification and sorting was done on the basis of discussion and consensus among the three researchers. Five activity structures were observed and categorized to describe the actions of expert teachers. The activity structures included: presentation/non-academic; warm-up; presentation/ demonstration; practice; and transition.

Routines were classified into three types: management, support, and interactive. Management routines can be thought of as tasks involving student-movement from one place to another and non-academic interactions. The management routines used were: enter the play area/line up; signal for stopping activity; water/restroom; and moving quickly and/or quietly.

Support routines were those that facilitated instructional actions, specifying the behaviors necessary for student learning to occur. These included routines

for: appropriate formations and/or spacing; distribution of equipment; and appropriate attire for class activity.

Interactive routines facilitate communication between the teacher and student. These included routines for: teacher questioning with student choral response; teacher questioning with a "call until correct" student response; paying attention, "eyes on me" teacher behavior; and hand raising by students.

After identifying the major activity structures and accompanying routines a preliminary coding scheme was developed by the three researchers. The definitions for the categories were refined when necessary and frequency counts were determined for the introduction and use of routines. Each decision was discussed and agreed upon by the three researchers. Finally, actions of each teacher were described in detail as the rules and routines were established. These were discussed and revised, going back to the videotape if necessary.

To establish reliability, the following procedures were used. First, the three researchers randomly selected one of the two lessons from day 1, day 3, and day 5 to code a second time. Results were compared with the original coding forms to determine intrarater agreement (.93). Second, a fourth researcher with previous experience in research procedures used in this study participated in a short training session. This researcher was given the set of generated constructs and decision log and asked to code three randomly selected tapes. The frequency counts within the categories were compared with those derived by the original researchers. Reliability for the general and specific levels of the coding instrument was .90 or higher.

Results and Discussion

Routines Within Activity Structures

The frequency of routines within their appropriate activity structures across the 5 day period are presented in Table 10. Collectively and individually, the presentation/non-academic structure was used most frequently for introducing and rehearsing routines. Differences between teachers within remaining activity structures are shown. EE-1 spent a significant portion of time rehearsing routines during practice, whereas EM-1 did not. Leinhardt et al. (1987) report that expert elementary classroom teachers use the highest number of routines during transition between activities (eg., changing from reading groups to a science lesson). One possible reason that differences exist is that the elementary student is contained in the classroom throughout the day, whereas they only spend 30-45 min per day with the physical education teacher. This time frame does not require the number of transitions which occur in the classroom. In addition, the terms transition hold different meanings for classroom and physical education settings. In classroom research, transitions usually occur between subject matter changes and in physical education, they usually occur between changes in drills or groups.

Insert Table 10 Here

Introduction of Routines Across the 5 Day Period

Table 11 presents data for introduction of routines. The majority of routines were introduced on day 1 and by day 5, procedures were routinized allowing for maximum instructional time to occur. Routines were most frequently introduced with an explicit statement from the teacher and/or modeling of the routine (eg., hand raising). Routines were generally reinforced through positive methods, but stern lectures were given when students failed to comply with instructions. Although both teachers had taught a number of years, they felt it necessary to have every detail recorded and lecture from notes during the first few days. They were extremely organized and efficient, including providing an attractive physical environment for students. This finding coincides with classroom research on effective classroom management (Brophy, 1987).

Insert Table 11 Here

Cumulative Frequency of Routines

The cumulative frequency of routines is presented in Table 12. There was an observed difference in total frequency of routines with the elementary teacher spending more time in introduction and rehearsal of routines (EE-1 = 190; EM-1 = 149). Further, the selecting of specific routines to emphasize was different for the two teachers. The routine used most frequently by the elementary teacher entailed a signal for stopping activity and questioning with a choral response (n = 41 for each category). The middle school teacher only practiced the stopping on a signal routine three times in the 5 day period. The

routine stressed most often by the middle school teacher was related to establishing appropriate dressing codes and locker room procedures (n = 36). However, the next most frequently practiced routine was questioning with a choral response which corresponds to EE-1.

Insert Table 12 Here

The differences in emphasis of routines may be due to a number of factors; personal style, student behavior, nature of activities, dressing code vs. non-dressing code, and finally, developmental levels. Brophy (1987) reported that changes in students' developmental levels creates various degrees of emphasis on classroom management strategies by classroom teachers. He stresses that during the primary grades, children must be indoctrinated to the rules, procedures, and routines of classroom life. Thus, a large amount of the teachers' focus must be placed on management instruction. Between second or third grade and fifth or sixth grade, students have learned most of the procedures and routines they need to know because young children generally identify and cooperate with adults. However, between fifth or sixth and ninth or tenth grades, when students are entering adolescence and beginning to identify with peers, they often distance themselves from and even resent adult authority. Therefore, management concerns become prominent again with more emphasis on disciplinary aspects.

Unlike classroom teachers of third graders who would not need to spend as much time with management instruction, this elementary physical education teacher spent a significant amount of time in this area. However, since the third grade students in this study were

receiving physical education instruction for the first time, they were not indoctrinated to rules, procedures, and policies of the contextual setting. Although many routines such as hand raising and choral response had obviously been introduced to students prior to their physical education instruction, many other routines unique to the setting were entirely new and required the teacher to manage the class as though they were early primary students. With regard to low management time spent by the middle school teacher, it is possible that a very stringent school-wide discipline policy contributed significantly to the manner in which students behave at that particular school. Although Brophy (1987) reports that this is a time of high concern for disciplinary managment, Evertson and Emmer (1982) also found that less time at the junior high school level was spent teaching and rehearsing rules and procedures.

Management/Support/Interactive Routines Summary

Both teachers introduced and rehearsed a higher number of interactive routines (EE-1 = 81; EM-1 = 66), that is, establishing communication routines between the teacher and the student than support or management routines. For EE-1, the management routines were of next highest frequency (n = 67) followed by support routines (n = 42). Due to the nature of the movement activity, EE-1 used a signal for stopping activity frequently, hence, inflating the number of management routines. However, by day 4, he was able to have each of 26 children tossing and catching a small rubber ball in a confined indoor play area without any management problems. When the command "Freeze" was given, students stopped activity immediately to pay attention. For EM-1, support routines were used

more frequently than management routines (n = 48; n = 35, respectively). The thrust or focus of the support routines was establishing an appropriate dressing code and locker room procedure. EE-1 used support routines less frequently than the other two categories (n = 42). Although Leinhardt et al. (1987) report the highest number of routines as support, contextual differences between classroom and gymnasium play a significant role in the findings presented here. The support routines in the classroom featured seatwork procedures such as: take out/put away, ruling paper, wait to start, open/turn to/look at/close, and keep busy when assigned work is finished. In physical education, fewer support routines are needed.

Retention of Routines

Both teachers were videotaped for one lesson during the end of the first semester of school to determine retention of rules and routines that were formed during the first week of school. Both still enforced 100% of routines at midyear. It was also observed that EM-1 had established a routine for distributing and collecting equipment and EE-1 had added a routine for wearing and removing coats during outdoor activity.

The teachers in this study are similar to classroom teachers (Emmer et al., 1980; Leinhardt et al., 1987) in the way they defined for the students procedures for class operation, including clear expectations of student behavior. Although both teachers exhibited a structured and orderly class by day 5, each used a different style to achieve this goal. EE-1 used an intimidation approach, while EM-1 used a mild desist management style.

The following account describes the detailed procedures used by both teachers in developing order in class at the beginning of the year. Rules, routines and disciplinary actions implemented by both teachers are described.

Expert Elementary Teacher (EE-1)

Biographical Sketch. EE-1 is a white male, 42 years of age, and has taught at the same urban elementary school for 12 of his 21 years of teaching. He has received an award from the state physical education association as the Outstanding Elementary Physical Education Teacher in Louisiana. In addition to his Master's Degree, he has earned +30 hours of graduate credit and participated in the statewide professional improvement plan.

His physical education (PE) program has achieved the state championship in physical fitness for the past 9 years. Also, his school has been the top money raiser of the state for the Jump Rope for Heart program, with an average earning of approximately $10,000 per year.

From information obtained from his questionnaire, EE-1 stated that the most important objective of his program is to establish a warm and caring environment which is optimal for learning to occur. He reported that the environment he tries to maintain is one in which high goals are established and that he provides the motivation for students to reach these goals. Other objectives include: for students to have fun; develop self discipline and respect; and "Be the best you can be, whatever the undertaking".

For the first few days, EE-1's intended objectives were setting policies for students to follow; stressing good work habits and the importance of working together;

and informally assessing students' social needs and ability levels. He also admitted that he uses an intimidation approach during these first days to achieve desired behavior from the students. (It was noted, however, that along with the intimidation approach, EE-1 established a fun-filled atmosphere by laughing and joking with students. He even laughed at himself in front of them on a couple of occasions).

Day 1. EE-1 used the first day to motivate students about physical education and the activities for the upcoming year. The play area was an indoor auditorium located in the center of the school. Classrooms were along two hallways, one on each side of the large room. The front office was also in close proximity. The students were brought to the play area and seated on the floor throughout the entire first day's lesson.

The students listened attentively as EE-1 told them they would be experiencing about 30 to 40 activities during the year and that his primary goal was for them to "have fun". He explained the meanings of the words goals and objectives to them. Other objectives, he stated, were to learn and to remain state physical fitness champions. He showed them a large symbol, #1, which was posted on the back wall and told them it had been there for 9 years and would remain there until they were no longer the state champions. This discussion was a question/answer style with routines for both choral responses and call until correct individual responses employed. EE-1 encouraged children to raise their hand before responding. Following the introduction of hand raising, he asked a question and immediately raised his hand to reinforce the expected behavior of the children. Other routines introduced at this time included an appropriate method for entering and leaving the play area, desired attire including footwear,

and rules for good sportsmanship. A health note was distributed and students were asked to get their parents to indicate any medical conditions regarding physical activity participation. The students were told that they would not be allowed to participate until this note was received. He strongly emphasized returning it the next day.

EE-1 specified his desire that all students <u>try all</u> of the activities that would be taught. He told them, "we all make mistakes and mistakes help us to learn". Students were assured that none of the other students would laugh at them and stated, "They may laugh at you one time, but they won't do it again". This was one example of EE-1's intimidation approach.

For the remainder of the 30 min period, incentive plans were discussed. These included: "the PE student of the week" and the introduction of the PE motto, "Be the best that you can be". For the PE student of the week, he showed them the button that is issued at the end of every week for the student in the class who tries the hardest, shows the best sportsmanship (e.g., "don't be a ballhog"), and gets along well with others. This student, along with being able to wear the button for the entire week, has the privilege of holding the water for the rest of the class everyday after PE during that week. Additionally, the following week, this student will be allowed to hold the door for the class when coming in and/or going outside to participate in activity.

The PE motto was rehearsed by the students in choral response and a lecture was given to students regarding doing their best in their classes, at home, and in PE. At this time, he also invited students to feel free to talk to him concerning any problems they may be facing and asked them to not be afraid to come to him for help.

The final incentive was an explanation that the school had been chosen as the only elementary school in the state to take part in the Russian Physical Fitness Testing. The test items were described briefly. He explained that children in Russia were taking the American Physical Fitness Test and this was a special program for the United States government. Students were notably excited with this information.

In closing the class, EE-1 reminded students to bring back the health notes. There were no physical activities taught during the first day. He did, however, set a very motivating and enthusiastic environment for the students. There seemed to be at atmosphere of caring and trust established, yet in a firm, commanding style. There were no reprimands whatsoever, as every student was at full attention throughout the entire presentation.

Day 2. Upon entering the indoor play area, students were instructed to sit quietly while EE-1 collected health slips. He requested that as he called roll, each child would bring him the "unfolded" note. Two of the 28 children failed to return a slip. They were isolated from the group until the completion of roll call at which time, the two "wallflowers" (as he referred to them) were given a harsh reprimand. EE-1 made it clear to all students that the health slips were considered an assignment and there was no excuse for failing to complete an assignment in his class.

The day's lesson was generally content-oriented but activities were used to introduce routine procedures for listening and maintaining appropriate spacing for activities. The students were first asked to spread out without touching anyone else. He presented a series of movement challenges, stressing the importance of listening carefully for a signal to stop movement; that is, "Freeze"

or "Stop". He proceeded slowly, keeping a close watch on the responses to the movement tasks and controlling for inattention by calling names of children showing incorrect movement. The tasks presented called for specific responses such as "touch your left knee with your right elbow". He reinforced that students must listen to and follow his specific instructions. A "Simon Says" game was implemented on the spur of the moment which seemed to be used simply as a rapport-builder situation. When questioned after class, EE-1 stated it was not part of his intended lesson plan. EE-1 laughed with children as he tried to catch a few "sleepyheads". Throughout the game, his sense of humor was exhibited.

EE-1 explained concepts of personal and general space and introduced a routine for getting into scattered formation. He said, "find your space, your personal space". After a series fo movement challenges emphasizing shapes and levels, EE-1 told students to look carefully at the location of their space. He asked them to remember the spot and return to this identical space the next day. Throughout the lesson, he monitored student responses calling on several students to correct body positions. Moreover, he stressed individual differences by expressing a desire for students to be creative and unique in their response to each movement challenge. He reinforced this by calling upon a student who had demonstrated a unique response and allowed him to demonstrate for the rest of the class.

Toward the end of class, EE-1 discussed yearly activities and introduced his expectations for indoor and outdoor student behavior. He indicated that while laughing and cheering teammates on during game play would be acceptable outside, a silent yell would be used when participating indoors. Once again, he emphasized his

desire for students to have fun, yet he continued to establish a business-like atmosphere by maintaining tight control over student's action.

In closing the lesson, a short review session using a choral response and "call until correct" individual response interactive routines were implemented. He reviewed the concepts of personal and general space and emphasized following directions by listening carefully to his specific instructions.

Day 3. Children entered the play area and were instructed to go to their "personal space" and spread out where they wouldn't touch anyone else. Using a "call until correct" individual response, activities from Day 2 were reviewed. Hand raising routines were demonstrated by the children. Activities began with a warm-up exercise routine, with strict attention given to proper form and technique and an emphasis on quiet indoor behavior. The entire class was stopped at one point, to correct for improper form during exercising. One student was asked to demonstrate proper technique.

He continued the lesson with a variety of movement experiences, enforcing listening for the signal to stop. Throughout the instruction, several breaks in activity were taken to stress performing movements correctly. Several students were asked to demonstrate locomotor skills. Appropriate indoor student behavior was reiterated by reminders to remain quiet, and a "no need for sound effects" statement. Although using firm control for discipline, at one point in the lesson segment, when he asked the children to twist their bodies, EE-1 broke into his rendition of "Come on baby, let's do the twist!" and performed the twist much to the student's approval.

The lesson proceeded with children participating in a series of throwing activities. After the children

practiced awhile, a review of correct technique with choral response was employed. EE-1 introduced expected behavior at the water fountain as the children lined up to return to the classroom. The procedure would be as follows: students would act as class monitors and tap a child misbehaving in water line and point to the classroom. The misbehaving child must leave the line and return to class without water. The monitors are designated by EE-1 by using a "color of the day". For instance, on day 3, the color was gray, so all children wearing the color gray were class monitors. Each day hereafter, the same procedures would be followed.

Day 4. During the fourth day, EE-1 established a line formation for calisthentics with students forming four straight lines. As the children entered the play area, he counted off in fours to assign them to groups, consiously delegating an equal number of boys and girls to each group. He called for group one to line up, evenly spaced under a row of lights. When a student who was not assigned a "one" joined the group, he immediately recognized the discrepancy and strongly enforced that students will always keep their assigned numbers whenever he makes groups or teams for the remainder of the year. The importance of remembering their assigned numbers was stressed by asking children in groups three, one, four, etc. to raise their hands for identification. These newly formed groups would remain intact for exercise procedures and game play for the first part of the semester.

Bean bags were distributed with EE-1 placing it in front of each child while giving instructions not to touch the equipment. He was explicit with instructions explaining that this rule would apply to any type of equipment for the remainder of the year. The content for the day's activity, which involved various throwing and

catching tasks, was described as children handled the bean bag familiarizing themselves with its texture and size.

Activity started with students tossing and catching while various directions were given as EE-1 employed a signal for stopping between skills. To maintain control and orderliness, students were instructed to drop the bean bag in front of them while he explained and/or demonstrated a new drill. As in previous days, much of the class time was spent with EE-1 emphasizing correct form. Oftentimes, activity was stopped so a demonstration of correct and incorrect form could be provided to ensure student understanding.

As children practiced, EE-1 traveled from student to student providing feedback and informally assessing skill levels. At the same time, to maintain class control, he monitored students on the opposite side from where he would be standing by commenting on their behavior and/or technique.

Another piece of equipment, a plastic scoop, was distributed to each child in the same procedure used for the bean bag. Equipment regulations were strongly enforced with sharp commands to children not complying with the proper procedure.

As part of a tossing/catching activity, EE-1 had students in group one turn and face group two and group three face group four. Students played catch with a partner. He reinforced paying attention to his commands as well as maintaining proper spacing.

After a short review, to close the class, the "color of the day" water routine was implemented as the children dismissed to return to their classes.

Day 5. The children entered the play area lining up in their pre-assigned exercise groups with each group spaced out under their row of lights as determined on day

4. As EE-1 quickly called roll, appropriate spacing was designated through a positive reinforcement approach. Instruction began with the calisthentic warm-up routine. By day 5, the children were familiar with the exercises and had noticeably improved their technique. On several occasions, EE-1 praised children using good form and corrected those who were not properly executing the exercises. Another exercise, the squat thrust, was added into the calisthentic routine. A student was called upon to demonstrate to the class while they remained quietly seated (Indian style) for observation. The child selected for demonstration had been reprimanded on several occasions earlier in the week for misbehavior. During the demonstration, EE-1 implemented a question with choral response to assess children's understanding of proper form. Students practiced the squat thrust to an exaggerated count with EE-1 placing importance on "not doing the exercise half-way".

The focus of the lesson was on throwing and catching using a small rubber ball. Each child was given a ball with EE-1 distributing the equipment using the procedure established in day 4. He monitored activity with strict attention given to catching the ball. Since there were 28 children in a relatively confined indoor area, several reprimands were made to children not using good judgment in tossing. On several occasions, EE-1 stopped the class using a "Freeze" signal for stop to point out a student using correct form and control. He would allow these students to demonstrate for the other students.

When changing from one drill to another, EE-1 had students place the ball on the floor, as he presented and demonstrated the drill. As children practiced, several times activity would be stopped by using a "freeze" or "hold up" command so EE-1 could question students about

the activity. Students would answer with a choral response. For the majority of the class, children were attentive but a "pay attention" routine was used on occasion to retain this alertness. For example, following a demonstration, several students began giggling. He stopped what he was doing immediately and said, "I'm up here trying to teach you and you're laughing thinking this is funny; you are here to learn. You need to listen and follow directions". Children promply responded to the reprimand.

Further, during the closing review, as the children were seated listening (with the ball by their side), one girl had to get her ball which had rolled away. EE-1 sharply disciplined her for handling the equipment without permission. Following the incident, he reissued the equipment ruling for the entire class.

As in previous days, the "color of the day" water routine was used. He made a statement regarding appropriate behavior in the water line and then students returned to their class.

Midyear Observation. One lesson was filmed in December to evaluate routines. After reviewing the tape and scoring routines in the same procedure as used for the first tapes, 100% retention of routines were still implemented in EE-1's third grade class. Children entered the play area (outside) and immediately formed exercise groups without any command from EE-1. As they were forming the groups, each student removed a jacket (if they had worn one) and placed them in a designated spot. They did this without instruction from the teacher. The exercise routine was the same one that was introduced during the first days of school. A basketball was placed on the ground in front of each of the nine groups of three children per group. Not one child touched the ball until

EE-1 called for group practice to begin. Following a short presentation of passing drills (i.e., bounce, chest, and overhead passes), the first child in each line picked up the ball and practiced. During the presentation, hand raising, questioning with choral response and individual "call until correct" response were employed. EE-1 monitored practice providing feedback for appropriate as well as inappropriate form. A "Freeze" signal for stop was used throughout the lesson. On several occasions during drill practice, EE-1 reinforced the need for children to pay attention and follow directions. The PE student of the week was wearing his orange button and was instructed to hold the water at the fountain while the PE student of the previous week was told to hold the door for the class. The "color of the day" was designated as children quickly and quietly picked up their coats and lined up to leave for water and return to their classroom.

The class was enthusiastic and orderly with no management problems encountered. The children exhibited a clear understanding of what to do, where to go, and how to act. Transitions were smooth allowing for maximized learning time and no disciplinarian actions were taken enabling the lesson to move quickly. Children were also preparing to take the Russian Physical Fitness Test and their Jump Rope for Heart Program.

Middle School Expert Teacher (EM-1)

Biographical Sketch. Teacher EM-1 is a white female, 33 years of age, and has taught at the same rural middle school for 11 years. All of her teaching experience is at the same school. In addition to her bachelor's degree, she participated in the statewide professional improvement plan. The school has a population of 900 students with an

equal racial distribution and predominantly middle to low socioeconomic status.

Teacher EM-1 stated that the most important objective of her program is to contribute to the physical, mental, emotional, and social well-being of each student. Other objectives included: creating an interest and challenge for each student by stimulating a desire to learn and improve, having goals within their reach, and creating a simple enjoyment of participation; for students to learn the history, rules, and strategies associated with each activity; for students to develop physical skills needed to participate in a sport with enjoyment, satisfaction, and safety; and for students to develop and maintain fitness.

During the first few days of the school year, Teacher EM-1 reported that her first goal was for students to gain understanding of what she expects from them throughout the school year. Other goals included discussing rules and regulations set forth by the physical education department, issuing gym suits and lockers, establishing appropriate dressing codes and seating orders for roll call, and introducing the daily warm-up exercise procedures.

Teacher EM-1 was an avid athlete in high school and college and participated in several collegiate sports. She attributes her own participation and love of sports to part of her success as a teacher. Other factors included complete support from administrative personnel, a good knowledge base in the content area, adequate facilities and equipment, and finally, common sense.

Day 1. The first day started with students entering the gym and sitting in the bleachers. The bulletin boards in the gym were nicely prepared with information regarding physical fitness. Teacher EM-1 spent a few minutes

checking that all students were in the appropriate class. One student was lost so the teacher directed her to the appropriate classroom. Another student came into the class late and EM-1 called out "Tardy" to the student and then inquired as to the reason. When finding out that the student had gone to the wrong classroom, she told the student she'd have to hustle to make it to the gym on time because her classroom was a long way from the gym. The rest of the students sat quietly while EM-1 was involved with the lost students.

The small gym was shared with another teacher of sixth graders. EM-1 directed her students (who were all girls) to sit at the far end of the gym in front of a table which contained class materials. She re-checked the roll and asked students to "listen up" and pay close attention. An absentee slip was then given to one student to take to the office. The teacher distributed envelopes to each student and explained the need for a $1.00 fee for health materials. The students were instructed to bring the envelopes back the next day.

Next, a departmental policy letter was issued. Students were told to take the letter to their parents, read it together, and both a parent and the student should sign the bottom portion and return it to school the next day. The letter contained the rules and regulations of the physical education department. The letter which explicitly described appropriate gym suits, socks, shoes, and locks was read to the students. The gym suit would be sold at school as well as local sporting goods stores which EM-1 had contacted prior to the opening of school. EM-1 required that all students mark their clothing with their names, indicating that she would provide a laundry pen the next day if students did not have one. She also required that no nicknames would be allowed on the

clothing, so that if the clothing was missing she would be able to identify the owner. Several times during the overview, EM-1 asked either questions to individuals or to the group with a choral response from the students.

At one point during discussion, two girls were engaged in a private conversation. EM-1 stopped going over the rules and quietly said, "Are y'all following with me?" The girls stopped talking immediately and were attentive the remainder of the class. This was the only evidence of misbehavior during the class period.

The girls were told to bring bandaids, sanitary supplies, deodorant, rubber bands and any other personal supplies they wanted to keep in the physical education lockers. A short lecture about hygiene was given emphasizing the need for everyone to bring towels, and use deodorant daily. She also asked the girls to bring roll-on rather than sprays because of the problem sprays create in the small locker room.

A great deal of time was spent describing the proper uniform and the desire for the class to look neat throughout the year. Physical education folders and pencils were required and would be kept in each student's locker at all times.

At the end of the class, EM-1 reminded students to bring the bottom portion of the letter and the envelope containing the health fee to class the next day. She also talked to the students about the excitement of the upcoming year as far as activities in class and school activities that would be available to the students (eg., pepsters, cheerleading, student council, yearbooks, sports teams). She instructed the students to leave through the front door of the gym when the bell sounded and that until that time, they could get water or use the restroom. She explained the procedures for water, restroom, and "mirror

time" which would be implemented at the end of each day's class period. Finally, she reminded students to always enter class at the side entrance way.

Days 2 and 3. The second and third days of school were spent issuing gym suits and assigning gym lockers to the girls. On both days, the students entered the gym through the side doorway and sat on the floor in front of the teacher's table. Before the sound of the tardy bell, students were instructed to get in place quickly and quietly. Students were also asked to raise hands to answer the roll while the teacher slowly reviewed the names. Each of the two days she called for new students to report to her and spent a few minutes explaining procedures to these girls. Each class started with students turning in signed form letters and the envelope containing the health fee. She would take fee money only if it was in an envelope with the students' name on it.

The girls came down to the locker room in small groups to try on gym suits. Teacher EM-1 checked the gym suit of each student to ensure proper sizing. During the fitting session, EM-1 talked to one student who was repeating the class due to failure the previous year. She told the girl she would like to see them have a good year together and that she expected her to dress and participate daily in all the activities. She conducted this lecture privately.

Following the purchasing of gym wear, EM-1 brought all students to the gym to begin locker assignments. The girls had been instructed in the letter to bring their own Master lock to school. A review of locker policies and procedures was conducted using questioning with both choral and individual responses. The girls were told to line up alphabetically in small groups in a quick and quiet manner with locks so EM-1 could record serial

numbers and lock combinations. Following this procedure, the students went to the locker room with the teacher to receive a locker assignment. Most students placed their suits and materials in the locker and then returned to the main gym area.

At the end of the class period, EM-1 reviewed the rules and policies and gave a lecture about responsibility. She told students that she could tell who would be responsible or not by the way they were returning (or not returning) papers. During the end of each class, EM-1 also supported the school and athletic events by announcing several of the activities.

By the third day, if students had not complied by bringing back materials and purchasing a gym suit, a short reprimand was given. She stated that she was displeased with students who had not returned their forms, money, or purchased clothing and locks. Class was dismissed each day after a short discussion regarding dressing procedures for the next day. Students were allowed water before leaving the facility. During the second and third days, class content was not discussed with the students; the entire lessons focused on procedures for dressing, behavior, and locker room rules and regulations.

Day 4. The students entered the gym at the side doorway and reported to the locker room and dressed in gym suits for class. All but one student reported in appropriate attire. Although this was the fourth day of school, the students actually had 5 days to secure gym clothing, because school had started on a Wednesday. As EM-1 checked roll, she assigned the girls to squad formation for exercise participation. She reinforced proper spacing of groups on two occasions. After calling names and allowing students to sit in their appropriate places, EM-1 went to the locker room and returned with a

student's notebook in her hand. She identified the owner and reprimanded her by telling her the next time it happened, she would keep it in her office. All students were reminded that no personal articles could be left out of the lockers in the locker room during class time.

At this time, EM-1 checked to see if names were placed on gym suits. For those who had not marked their clothing, she reminded them to have it done for the next class meeting. Students were told to go outside to the track stadium, remembering to be quiet along the way. As the girls walked to the track, EM-1 casually talked with a group of students. All students followed directions and there were no disruptions or misbehavior.

When arriving at the track, EM-1 introduced the fitness unit to the students. She informed them that they would begin a conditioning program for a fitness evaluation, and that part of the evaluation would be a 1 mile run. She provided jogging tips, both physically as well as mentally. She demonstrated the appropriate running style and suggested that the students stay close to the inside of the track. The value of setting short-term goals was them emphasized. She told them that following the evaluation, they would receive Fitnessgrams which would provide information regarding their level of fitness. During this time, she commented about how neat the uniforms looked and requested that all shorts be seen (i.e., the girls had to tuck in their shirts or tie them on the side). EM-1 used questioning with choral response during the presentation of content. The students then began jogging and walking two laps around the track. EM-1 observed students, encouraged them and provided strategies and feedback as they completed the first lap. At the end of the second lap students walked to cool down and casually waited for the remainder of the students to

finish the activity. During this time, EM-1 asked several girls if they would be going out for the track team, pepsters group, or cheerleader. She encouraged all the students to get involved in some type of extracurricular activity. When all students had completed the activity, she complimented them on their performance and appearance and explained to them that they would continue this same procedure the following day. She told them when they got to the track the next day, they could begin jogging immediately without additional instruction. She then asked them to return to the gym without interfering with other classes. They were instructed to get water, dress in and wait in the gym area for the bell before leaving out the front door of the facility.

Day 5. The girls entered the side of the gym and reported to the dressing room following procedures described in Day 4. On Day 5 every student was dressed for participation and all personal belongings were properly stored in lockers. The girls dressed quickly and reported to their assigned seat within a team squad. Two girls came to EM-1 for assistance during the dressing period; one could not work a combination lock, and one needed help with a lost contact lens. These problems were solved quickly with little confusion. During attendance and uniform check, several girls tucked in their shirts without any comment from the teacher. She reinforced wearing proper footwear and indicated that if students did not wear tennis shoes for activity, they would not be allowed to participate. She asked if any students needed to turn in forms or be assigned a locker, and two students responded. Before beginning instruction, she asked the groups to spread out and get into proper formation.

A warm-up exercise was introduced with the teacher demonstrating and explaining each exercise. Following the

demonstration, students performed the exercise with the teacher also participating. She encouraged all students to count while performing the exercise. Exercises were stopped with a command from the teacher. These exercises included a coordination jumping jack, sit ups, push ups, arm exercises, and several stretching exercises for the legs.

The girls were told to report to the track without disturbing classes in progress in the building. When getting to the track the girls started jogging and walking without waiting for the teacher. During activity, EM-1 observed, encouraged, and offered suggestions as the girls completed the first lap. Following the activity, students were given praise for their performance and neat appearance and informed of activity and expectations for the next day's class. At the end of the presentation, students were told to return to the side entrance of the gym in the same orderly manner they had exhibited earlier. By Day 5, students knew that water privileges were allowed at the end of activity. Dressing in from activity was done quickly, and it was noted that all girls had supplied their lockers with expected hygiene products, including the roll-on style deodorants. After dressing, the students returned to the main gym area and exited from the front entrance without instruction from the teacher.

Midyear Observation. During the midyear observation, 100% of the routines established during the first days of school were observed. It was also noted that a routine for distribution and collection of equipment was in effect. Due to the nature of the first unit, fitness, where the students were not using equipment, this routine was obviously established at a later time. All girls were dressed in the school physical education uniform.

The midyear lesson which was volleyball was conducted as a coeducational class with the seventh grade boys' class. EM-1 provided instruction for the entire group. The lesson started with roll call followed by warm-up exercises with students in assigned squad formation. The skills were explained and demonstrated by EM-1. Then, students broke into small groups and performed skills, with EM-1 rotating from group to group providing feedback. The male teacher assisted in group rotation and instruction to individual students. At the close of the lesson, all students came to the center of the gym in a close seated formation. The skills were reviewed with a question and answer session using both choral and individual responses. Consistent with the procedures established at the beginning of the year, she explained to students what they could expect for the next day's activity. Girls returned to the locker room quickly and quietly and followed the same procedures for leaving the facility that were established the first week. The locker room was neat and all students kept personal items in lockers during class time. It was also observed that the student who had failed the previous year and had received a short lecture in one of the first day's lessons, was dressed appropriately, cooperating with the teacher and classmates, and participating in class activity. When questioned, EM-1 reported that the student was performing well in class earning B's and C's up to that point in the grading period.

Summary

The purpose of Phase 4 was to determine the way in which expert teachers at the elementary and middle school levels establish rules and routines at the beginning of the school year. The teachers in this study resemble

teachers of classroom research (Clark & Elmore; Emmer et al., 1980; Leinhardt et al., 1987) in the way they defined explicit class procedures and expected student behavior.

The elementary teacher devoted more time to management instruction and rehearsal of routines than did the middle school teacher. However, neither teacher experienced any disruptive or rebellious behavior from students during the observation period. It is probable that each teacher's reputation for structure, discipline, providing stimulating activities and quality instruction was known to the students. Although it was the first time for students to receive instruction from the teacher at each level, the majority of students attended the same school the previous year. Therefore, they had the opportunity to observe and talk to school friends regarding expected behavior. Research on teacher reputation is limited; however, Smith and Geoffrey (1968) reported that reputation played a role in creating order in the class.

Both teachers followed a procedure for establishing order that was described by Smith and Geoffrey (1968) as containing four major aspects: "grooving the students", that is, having them rehearse rules and procedures; communicating a sense of seriousness ("I mean it"); following through when incidents occurred that involved the rules and procedures; and finally, softening the tone of the management system by using humor.

One of the most difficult tasks the new beginning teacher encounters is that of establishing effective rules and management routines. Examining the ways in which experts perform these tasks at the beginning of the year should provide the novice teacher added insight into the teaching process. Brophy (1987) recommends that teacher training programs should provide sustained and supervised

field experiences for students during the first week or two of the school year to enable them the opportunity to learn management strategies. In addition to providing appropriate field experiences, the next phase should be that of training novice teachers management strategies and assessing the effectiveness of these training programs in the development of effective classroom management.

General Discussion

This study examined thought processes including problem-solving and interpretations of instructional situatons of expert and novice physical education teachers. Thoughts, concerns, decisions, and awarenesses of expert and novice teachers during instruction were studied as well as their students' perceptions of the instruction. Class rules and management routines established at the beginning of the school year by expert teachers were also identified and discussed.

The results showed substantial differences between expert and novice physical education teachers in their thinking processes. The expert physical education teachers in this study possess characteristics similar to experts who have been studied in classroom situations and in other fields (e.g., physics and chess). The expert teachers also resembled experts in other areas in their domain-specific knowledge schemata (Glaser, 1987). Specifically, these physical education teachers when compared to the novice teachers: (a) could more accurately interpret situational events pertaining to instruction, (b) achieved greater insight and made more inferences from pertinent teacher and student behavior cues available to them, (c) provided more descriptive information and included more creative solutions to

problems presented to them, (d) were more concerned with individual student needs in both hypothetical and real situations, (e) focused on pupil learning and attentiveness to a greater extent in both hypothetical and actual instructional situations, (f) primarily based decisions during interactive teaching on student skill performance, with a low percentage of management concerns, and (g) stimulated their students to spend more class time (three-fourths of instructional time) thinking about skill performance and activity concepts and less time being confused about procedures, drills, skill performance and class routines. Previous research reviews (Brophy, 1986) indicate that engagement rates and ultimately achievement are related to a teacher's ability to organize a classroom with well-established routines. The two expert physical education teachers selected for detailed study spent considerable time during the first week of the school year introducing and rehearsing effective class routines which were maintained throughout the year.

The novice physical education teachers in this study were concerned primarily with managerial and procedural facets of instruction. One probable explanation has been advanced by Fuller (1969), who maintains that teachers progress through three stages of concerns as they mature: Stage One: Self-Concerns - the teachers's own adequacy and survival as a teacher; about class control, being observed, and about the fear of failure; Stage Two: Task Concerns - the mastery stage, dealing with the tasks of teaching; working with too many students, lack of instructional materials, time pressures, and so forth; Stage Three: Impact Concerns - recognizing the social and emotional needs of the pupils, individualization of instruction and so forth. It is not certain, however, when and how teachers advance through these three stages.

Moreover, it is not known when and how expert teachers acquire the special teaching skills and domain-specific knowledge they possess.

This study represents a small step toward a complete understanding and explanation of what constitutes expertise in teaching physical education. However, a logical approach to a thorough conceptualization of teaching effectiveness in the gymnasium is to identify and describe thinking processes of expert teachers and their students. Subsequently, teacher training programs must strive to develop effective strategies for future teachers to acquire the necessary knowledges and skills needed to be a successful teacher. It is not even clear whether all of these qualities can be acquired during preservice professional preparation programs. It is my belief, however, that through systematic observation and analysis of the expert teacher, new teachers, as well as teachers who are experiencing difficulties, can gain useful knowledge. It is also important to identify successful learning strategies used by students which help them to achieve success both with skill performance as well as with the comprehension of the specific underlying concepts and game strategies involved. Once these strategies are clearly identified, teachers should be trained to enhance the strategic thinking skills of their students.

Whether the results reported here are generalizable to other populations or simply specific to the teachers and students in this study is uncertain. It is also questionable as to whether teacher expertise as defined here would be applicable to other industrialized populations where schools are more advanced. For example, it would be of interest to compare responses from participants in this study with students and teachers of physical education training schools such as those in the

Soviet Union and East Germany. These schools have highly trained instructors who are experts in a particular sport. Additionally, the students are top-performing athletes who have the potential to represent their countries in the Olympics. Would the criteria established for teacher expertise in this study be an accurate measure when these characteristics are compared to teachers in specialized physical education programs? Would responses from elite athletic students be comparable to those of students in the schools of this study? What cognitive processes exist with elite athletic students--what are their thoughts during class instruction---what ways do teachers help them learn? What role does sport-specific knowledge structures play in the development of teacher expertise? Further, what relations do sport-specific knowledge structures and knowledge of pedagogical principles of teaching have to teacher decision-making during instruction? In addition to examining these questions, it would be equally important to study the function of teacher's beliefs in the relation to the cognitive aspects of instruction. To continue along the lines of the hypothetical study of teachers in physical education training schools, what values and beliefs do they possess and are these different from those of teachers in the typical public school? How do these beliefs affect the way teachers plan for and implement activities in their classes?

These questions, as well as many others concerning the teaching/learning process remain unanswered. Investigating teacher behavior as well as teacher and student cognitive processes are challenging areas of study. The methodological procedures employed in this study are only some of the techniques that can be used to gain greater understanding of the complex components involved in effective teaching.

There is a need to replicate and expand the findings presented in this study and incorporate a variety of research designs before theories of teacher expertise in physical education can be formulated. Longitudinal research on outstanding students in teacher training programs who then engage in teaching physical education is needed to analyze how characteristics develop over a period of time. Hopefully, by gaining knowledge and understanding of how expertise develops, we will then be able to expedite the professional preparation of teachers, which will allow them to concentrate less on managerial and organizational tasks and expend more of their energies on pupil learning.

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Table 1

Demographic Data of Expert Teachers (n = 4)

Teach.	Grade Level	Yrs Exp.	Age	Sex	School Pop.	Rac. Dist. (W/B)	Dominant SES of stud.
M-1	6,7,8	11	33	F	900	50/50	low-middle
M-2	6,7,8	12	34	F	650	60/40	low-middle
E-1	3,4,5	21	42	M	603	75/25	middle
E-2	3,4,5	17	39	M	350	30/70	low

Note. E = Elementary Level; M = Middle School Level

Table 2

Scenarios of Instructional Situations

Instructions: Read the following scenario and analyze and describe what you would do in this teaching situation.

Scenario #1

Age Level of Students: 6th grade

You have just introduced a new square dance unit to your class. You set up the squares and realize that you have unequal numbers of boys and girls. Your students do not want to hold hands with their partners. Girls and boys alike are giggling and making remarks to one another. You have an integrated school and some blacks and whites do not wish to dance together. You have two students who are forbidden to dance due to religious affiliations. You are being observed by your principal today.

Scenario #2

Age Level of Students: 3rd Grade

It is winter and you are teaching in a lower income elementary school in rural Louisiana. You share an auditorium wiht the music/strings/piano teacher. In addition, your auditorium has ceiling fans which limits your indoor activities such as basketball and volleyball. There are four assemblies scheduled during this winter including a large Christmas musical which is requiring additional practice by the music teacher.

Scenario #3

Age Level of Students: 5th grade

One of your students, Rudi, is a very poor child. She has eight brothers and sisters. Her mother and grandmother are raising the children by themselves and

Table 2 cont'd.

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receive welfare. They live in the local housing project. Rudi sleeps with several of her younger sisters who urinate in the bed. In addition to the urine smell, she has poor personal hygiene, that is, bathes infrequently and wears dirty clothes. Rudi is a low-skilled student in physical education but does not qualify for adapted physical education. She is also in the lower quartile of her classroom. The other children make fun of her and do not want her as a partner on their relay teams or sport teams in any of your planned activities.

Scenario #4

Age level of students: 10th grade

Bo J. is an exremely talented athlete. He excels in football, baseball, gymnastics, tennis and track. He has become bored working on the drills and practice sessions which you have designed for your unit. He is becoming rebellious and uncooperative in your class. He is popular and therefore getting a good number of his friends to join in with this "uncooperative" routines.

Scenario #5

Age Level of Students: 7th Grade

You are teaching a fitness unit. In your grading, your primary objective is achievement in fitness. One of your students, William P., is obviously overweight and unskilled. He has expressed desire to lose weight and become physically fit. He works hard in all of the exercise sessions and reports to you that he is working on his diet. However, at the end of the unit, his fitness scores are still very poor. Answer the following:

Table 2 cont'd.

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1) How will you handle William P. and this situation?

2) How will you evaluate William P. at the end of the unit in light of the stated objectives which are achievement in fitness?

Table 3

Interactive Thoughts and Decisions for Expert and Novice Teachers

	Expert		Novice	
	n	%	n	%
Decisions				
Supplementary	15	20.3%	1	1.3%
Pupil-Related	50	67.6%	40	51.3%
Plan-Related	6	8.1%	28	35.9%
Explanation of Events	3	4.0%	9	11.5%
TOTAL	74	100.0%	78	100.0%
Concerns				
Pupil Attention	63	29.0%	64	22.1%
Pupil Attitude	31	14.3%	11	3.8%
[a] Pupil Learning	83	38.2%	18	6.2%
Declarative Knowledge	31	14.3%	9	3.1%
Procedural Knowledge	38	17.5%	8	2.8%
Strategic Knowledge	14	6.5%	1	.3%
Pacing: Pupil-Related	14	6.5%	10	3.5%
Sub-Total (Pupil Concerns)	191	88.0%	103	35.6%
Pacing: Plan-Related	8	3.7%	32	11.0%
Procedure-Management	8	3.7%	54	18.6%
Procedure-Instruction	2	.9%	26	9.0%
Procedure-Organization	8	3.7%	68	23.4%
Procedure-Equipment/ Facilities/Extraneous	0	0	7	2.4%
Sub-Total (Lesson Implementation Concerns)	26	12.0%	187	64.4%
TOTAL	217	100.0%	290	100.0%

Table 3 (cont'd.)

	Expert		Novice	
	n	%	n	%
Information Source				
Observation-verbal	4	6.2%	5	7.7%
Observation-skill perf.	47	73.4%	20	30.8%
Teacher expectation	3	4.8%	21	32.3%
Teacher hunch	4	6.2%	5	7.7%
Teacher recall	6	9.4%	14	21.5%
TOTAL	64	100.0%	65	100.0%
Awareness				
Principles of Teaching	13	21.0%	2	2.5%
Teacher Feelings	16	25.8%	18	22.8%
Alternatives	27	43.5%	55	69.6%
Teacher Behavior	6	9.7%	4	5.1%
TOTAL	62	100.0%	79	100.0%
GRAND TOTAL	417		512	

[a] Note. The subcategories of declarative, procedural and strategic knowledge comprise the total for pupil learning statements.

Table 4

Interactive Thoughts and Decisions for Expert Elementary and Middle School Teachers

	Middle School		Elementary	
Decisions	n	%	n	%
Supplementary	7	10.3%	9	10.7%
Pupil-Related	42	61.8%	48	57.1%
Plan-Related	17	25.0%	17	20.2%
Explanation of Events	2	2.9%	10	12.0%
Concerns				
Pupil Attention	64	22.6%	63	27.6%
Pupil Attitude	29	10.2%	13	5.7%
[a] Pupil Learning	53	18.7%	48	21.2%
Declarative Knowledge	27	9.5%	13	5.7%
Procedural Knowledge	18	6.4%	28	12.3%
Strategic Knowledge	8	2.8%	7	3.1%
Pacing: Pupil Related	14	5.0%	10	4.4%
Sub-Total (Pupil Concerns)	160	56.5%	134	58.8%
Pacing: Plan-Related	23	8.1%	21	9.2%
Procedure-Management	37	13.1%	25	11.0%
Procedure-Instruction	16	5.6%	12	5.3%
Procedure-Organization	46	16.3%	30	13.2%
Procedure-Equipment	1	.4%	6	2.5%
Sub-Total (Lesson Implementation Concerns)	123	43.5%	94	41.2%

Table 4 (cont'd.)

	Middle School		Elementary	
Information Source	n	%	n	%
Observation-verbal	4	7.3%	5	7.1%
Observation-skill perf.	20	36.3%	40	57.1%
Teacher expectation	14	15.5%	10	14.3%
Teacher hunch	5	9.1%	4	5.7%
Teacher recall	12	21.8%	11	15.8%
Awareness				
Principles of teaching	10	14.1%	5	7.1%
Teacher feelings	17	23.9%	17	24.3%
Alternatives	36	50.7%	46	65.7%
Teacher behavior	8	11.3%	2	2.9%

[a] Note. The subcategories of declarative, procedural and strategic knowledge comprise the total for pupil learning statements.

Table 5

Definitions for Categories for Student Thought Processes During Instruction

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Affective Thoughts: refers to student feelings and emotions.

Negative Evaluation of Self: Thoughts expressed related to negative feelings of how the student will perform or what others may be thinking of them.

Examples: I was thinking I wasn't doing it right
I didn't want to be embarassed in front of the class
I was nervous
I didn't want the teacher to use me as an example in front of the rest of the class
I know I'm going to have the wrong score

Negative Feelings about Situation/Events/Teacher: thoughts expressed relating to negative feelings toward the class activity or the instructional processes.

Examples: If everybody would just play their positions..
I wish the teacher wouldn't take so much time
I'm bored
I'm mad about having to play goalie
I wish the kids would act right
Why do we have to be doing this anyway?

Table 5 cont'd.

Postive Feelings About Situation/Events/Teacher: Opposite for negative category. Examples:

I couldn't wait to get my turn
I admire the teacher a lot
I was thinking how much fun we're having in class

Motivating Self: Techniques used by students to try to do the skill or activity correctly. Examples:

I was trying to do it right
I wanted to be good for the teacher
I was trying to do the best I could

Wanting to Get Done: Student expresses thought related to desire to simply complete the task; to just get through the activity. Example:

I was just trying to hurry and finish my turn

Self/Team Task Assessment: Student thoughts regarding how they will perform an activity (the process) or an evaluation of their own performance in an activity. It also includes thoughts of how their team or group will perform. Examples:

I was wondering how I could kick the ball
I was wondering how I would do when it was my turn to kick..would I kick high or low?
I was wondering if my team would do good

Table 5 cont'd.

Self/Team Assessment-cont'd.

I finally got it right
I understood it
The test was easy

Winning/Gaining Recognition: Thought relative to the outcome (the product) of an activity or thoughts of personal recognition from the teacher or classmates.
Examples: I was thinking to come in first place
I was thinking of my team winning

Comprehension of Instruction: Refers to student thoughts related to ways in which they learn or understand the activity or expressions of confusion in trying to comprehend.

Confusion-Skill Performance: thoughts related to confusion over how they were performing the skill activity. Examples:

I was wondering if I was kicking the ball right
When the ball came to me I didn't know what to do

Confusion-Procedures/Routines/Drills: Student doesn't know where to go or what to do during class activity. Examples:

I was trying to figure out--do we take the score sheet with us or what?
I was trying to think was I on the green team or the yellow team
I just didn't know where to go

Table 5 cont'd.

Confusion-Cognitive Concept: Misunderstanding of the lesson content. Examples:

I don't understand anything about soccer
I didn't understand the player positions
I couldn't figure out what she meant by adding the scores together

Attending: Student reports paying attention to instruction. Examples:

I was listening
I was paying attention
I was concentrating
I was trying to keep up with her

Remembering: Student reports trying to remember what had been taught. Example:

I was just trying to remember what she had told us

General Concept: Student reports thinking about a general cognitive concept associated with the lesson content. Examples:

I was thinking about how to keep score
I was thinking about how to put the score on the scoresheet

Table 5 cont'd.

Specific Concept: Student reports thoughts about a specific cognitive strategy used to help learn the lesson content. Examples:

I was trying to add the scores together to figure out the score to put on the sheet

I was trying to hold my pencil on one box and then add back to the other box and bring my scores together for a final score

Skill-Related Thoughts: any thought expressed which related to the game or skill activity for the lesson.

General Skill Technique or Game Play: A general statement reflecting thoughts about the game or skill. Examples: I was thinking of going bowling

I was thinking of playing soccer

I was thinking of running

I was thinking of just kicking the ball

I was thinking of rolling the ball

Specific Skill Technique: Thoughts reflecting a specific way of performing a skill. Examples:

I was thinking of taking four steps, bend low, and roll the ball, and aim

I was thinking about trying to play defense and trying to chip kick the ball all the way to the goal and score

Player Positioning/Teams: Thoughts about the position or team--wishing to be with members of a team or wishing to be a position on a team. Examples:

Table 5 cont'd.

Player/Team Positioning-cont'd.

I was wondering what team I'll be on

I was wondering what position she'll give me

I was wishing to be a goalie

Social Thoughts: Any thought related to friends, boyfriends, girlfriends, etc. Examples:

I wanted to be with my friends

I was hoping I could play with my friends

Off-Task Thoughts: Any reported thought not pertaining to the lesson content. Examples:

I was thinking of cheating

I was thinking about going to the football game this weekend

Table 6

Student Perceptions of Lessons of Expert and Novice Teachers

	Novices		Experts	
	n	%	n	%
Affective Thoughts	248	64.1%	205	49.5%
Negative Eval of Self	31	12.5%	28	13.7%
Negative Feeling of Situation/Events/Teach	50	20.2%	12	5.8%
Positive Feeling of Situation/Events/Teach	24	9.7%	35	17.1%
Motivating Self	54	21.7%	87	42.4%
Wanting to Get Done	21	8.5%	13	6.3%
Self/Team Assessment	50	20.2%	29	14.1%
Winning	18	7.2%	1	.6%
[a]Comprehension (Total)	44	11.4%	78	18.9%
Confusion (Sub-total)	40	90.9%	19	23.1%
Confusion-Skill Perf.	10	22.7%	5	6.4%
Confusion-Procedures/ Routines/Organization	20	45.5%	2	2.6%
Confusion-Cognitive Concept	10	22.7%	11	14.1%
Processes (Sub-total)	4	9.1%	60	76.9%
Attending	3	6.8%	14	17.9%
Remembering	0	---	10	12.8%
General Concept	1	2.3%	24	30.8%
Specific Concept	0	---	12	15.4%

Table 6 cont'd.

	Novices		Experts	
	n	%	n	%
Skill-Related Thoughts	52	13.4%	94	22.7%
General Skill or Game Play	34	65.4%	56	59.6%
Specific Skill Technique or Game Strategy	9	17.3%	35	17.3%
Player Positioning/Teams	9	17.3%	3	3.2%
Social Thoughts (Friends)	13	3.4%	8	1.9%
Off-Task Thoughts	19	4.9%	15	3.6%
No-Reply or "I can't remember"	11	2.8%	14	3.4%

[a]Note. Cognition category encompasses both confusion and specific thought processes reported by students.

Table 7

Student Thoughts Regarding Ways Expert and Novice Teachers Help Them Learn

	Novices		Experts	
	n	%	n	%
Demonstration	33	25.8%	65	16.6%
Explanation	65	50.8%	69	28.4%
Review	4	3.1%	16	6.6%
Individual Feedback	6	4.7%	35	14.3%
Task Analysis	3	2.3%	20	8.2%
Provided Handouts/AVs	0	---	10	4.1%
Participated with Students	4	3.1%	5	2.1%
No Reply	8	6.3%	16	6.6%
Other (provide practice/ watch teacher help other students, etc.)	5	3.1%	8	3.3%
TOTAL	128	100.0%	244	100.0%

Table 8

Student Thoughts Regarding Better Ways to Learn Activities From Expert and Novice Teachers

	Novices		Experts	
	n	%	n	%
Provide More Practice	5	2.7%	0	--
Change Procedures/Routines	22	12.1%	6	4.2%
Change Organization of Drills/Activity	23	12.6%	21	14.8%
Provide More Feedback	6	3.3%	0	--
Exercise With Students	5	2.7%	1	.7%
Change Warm-up Exercises	22	12.1%	22	15.6%
Provide Better Explanation or Demonstration/Clarity	18	9.8%	0	--
Have Better Class Control	20	10.9%	1	.7%
Provide Outside of Class Experiences	3	1.6%	6	4.2%
No Change in Lesson	48	26.2%	82	57.7%
No Reply	5	2.7%	2	1.4%
Other (More game play, provide instructional aids, or speed up)	1	.7%	6	3.3%
TOTAL	178	100.0%	147	100.0%

Table 9

Student Perceptions of Elementary and Middle School Teachers' Lessons

	Elementary		Middle School	
	n	%	n	%
Affective Thoughts	251	55.9%	202	57.4%
Negative Eval of Self	35	13.9%	24	11.9%
Negative Feeling of Situation/Event/Teacher	18	7.2%	44	21.8%
Positive Feeling of Situation/Event/Teacher	30	11.9%	29	14.4%
Motivating Self	98	39.0%	43	21.3%
Wanting to Get Done	2	.8%	32	15.8%
Self/Team Assessment	52	20.7%	27	13.4%
Winning	16	6.5%	3	1.5%
[a]Comprehension (Total)	61	13.6%	61	17.3%
Confusion (Sub-total)	27	44.3%	31	50.8%
Confusion-Skill Perf.	12	19.7%	3	4.9%
Confusion-Procedures/ Routines/Organization	9	14.8%	13	21.3%
Confusion-Cognitive Conc.	6	9.8%	15	24.6%
Processes (Sub-total)	34	55.7%	30	49.2%
Attending	10	16.4%	7	11.5%
Remembering	4	6.5%	6	9.8%
General Concept	12	19.7%	13	21.3%
Specific Concept	8	13.1%	4	6.6%

Table 9 cont'd.

	Elementary		Middle School	
	n	%	n	%
Skill Related Thoughts	94	20.9%	52	14.8%
General Skill Technique or Game Play	61	64.9%	29	55.8%
Specific Skill Technique or Game Strategy	29	30.8%	15	28.8%
Teams/Positions	4	4.3%	8	15.4%
Social Thoughts (Friends)	6	1.3%	15	4.3%
Off-Task Thoughts	15	3.4%	19	5.4%
No Reply or "I can't remember"	22	4.9%	3	.8%

[a]Note. The category cognition encompasses both confusion and specific thought processes reported by students.

Table 10

Routines Within Activity Structures Across the 5-day Period

ACTIVITY STRUCTURE	DAY					
Elementary Teacher	1	2	3	4	5	total
Presentation/ Non-Academic	25	6	7	17	11	66
Presentation/ Demonstration	0	9	5	11	3	28
Practice	0	8	23	13	23	67
Transition	0	5	1	14	7	27
Warm-Up	0	0	2	0	0	2
TOTAL	25	28	38	55	44	190
Middle School Teacher						
Presentation/ Non-Academic	35	22	33	21	15	126
Presentation/ Demonstration	0	0	0	3	4	7
Practice	0	0	0	0	2	2
Transition	0	0	0	1	6	7
Warm-Up	0	0	0	0	7	7
TOTAL	35	22	33	25	34	149

Table 11

Introduction of Routines Across the 5-day Period

ROUTINE	DAYS				
Management	1	2	3	4	5
Enter Play Area/ Line Up	EM/EE				
Signal for Stop			EE		EM
Water/Restroom	EM		EE		
Moving Quickly/Quietly	EM	EE			
Support					
Formation/Spacing		EE	EM		
Distribution of Equipment				EE	
Appropriate Dress/ Lockers	EM/EE				
Interactive					
Question/Choral Response	EM/EE				
Question/"Call until Correct" Response	EM/EE				
Paying Attention/"Eyes On Me"	EM			EE	
Hand Raising	EE	EM			

Table 12

Frequency of Routines Within Activity Structures

EM=Expert Middle School

EE=Expert Elementary School

	Enter Play Area/Line Up	Signal for Stop	Water/Restroom	Move Quickly/Quietly	Permission to Speak	Equipment	Lockers/Appropriate Dress	Instructional Response	Inst. Ind. Response	Pay Attention	Hand Raising	ACTIVITY STRUCTURES
EM	15		4	5	5		35	23	12	11	10	Presentation/Non-Acad.
EE	9		4	4	7	2	2	18	8	2	13	
EM	1				1		1	1	1	1		Presentation/Demonstration
EE		1		2	3	2		12	2	1		
EM				2								Practice
EE		37		5	6	4		8	1	3	3	
EM	2		2	1	2							Transition
EE		1		1	8	9		3	2	3		
EM		3			4							Warm-Up
EE		1		1								
EM	18	3	6	8	12	0	36	31	13	12	10	SUB-TOTAL
EE	9	41	4	13	23	17	2	41	18	9	13	
	27	44	10	21	35	17	38	72	31	21	23	TOTAL

APPENDICES

APPENDIX A

Extended Review of Literature

Current efforts to assess the effectiveness of teachers in classrooms and gymnasiums have included a study of expertise in pedagogy. Research on the psychological nature of expertise includes an examination of the cognitive processes employed by experts and novices as they perform domain-specific tasks. The purposes of this paper are to: (a) provide a background for the study of expert teachers from the cognitive psychology expertise literature, (b) summarize the research available which explains expert teacher behavior in the classroom, (c) summarize the research avialable which explains expert teacher behavior in the gymnasium, and (d) discuss other areas of study needed to help understand the nature of expertise in physical education pedagogy.

Cognitive Psychology Expertise Research

The pioneering work of de Groot (1965) and Chase and Simon (1973a, 1973b) explored memory, problem-solving, and information processing differences in expert and novice chess players. Experts differed from novices mainly in terms of measures of logical thinking and general problem solving. Experts were better able to process large masses of domain-specific information without loss of detail; however, experts and novices did not differ with regard to general measures of span memory and working memory. Further, experts did not evidence superiority in logical reasoning and did not search through more possible moves; if anything, the master chess players considered fewer alternatives than weaker players before choosing a move.

Further studies by Chi (1978) and Chi and Koeske (1983) examined recall contrasting high- and low-knowledge children in chess skill and also of a child with expert knowledge regarding dinosaurs. The findings revealed that

differences between high- and low-knowledge individuals are attributed to the influence of knowledge in content areas, rather than exercising memory capabilities.

Research on problem solving differences between experts and novices has been conducted across a variety of domains: chess, physics, architecture, electronics, and radiology (Glaser, 1987). Fairly consistent findings have demonstrated that differences exist in how experts and novices approach problem solving. The solution is addressed on the basis of domain-related knowledge and the organization of this knowledge. This research suggests that novices' representations are organized around the literal objects and events which are given in the problem statement. Conversely, experts' knowledge is organized around inferences about principles and abstractions that underly the situation. For example, in physics, Chi, Feltovich, & Glaser (1981) and Chi, Glaser, & Rees (1982) examined expert/novice differences when asked to classify problems in mechanics (an inclined plane problem). The novices classified the problems according to the physical properties of the solution, whereas the experts categorized problems in terms of applicable physics principles. Further, the experts demonstrated knowing how to apply their knowledge. The findings suggested that the problem-solving difficulties of novices were attributed largely to the nature of their knowledge bases, and much less to the limitations of novice's processing capabilities. The limitations of their thinking are due primarily to their inability to infer further knowledge from the literal cues in a problem situation.

The organizations of knowledge that are developed by experts can be thought of as theories of knowledge or schemata. The schema as defined by Glaser (1987) is a modifiable information structure that represents generic

structures of concepts stored in memory (p. 68). Schemata represent knowledge that people experience, that is, interrelationships among objects, situations, and events. It enables individuals to impose meaning on a situation and make inferences from partial information. The schemata include goal structures that can be matched to the demands of a problem. Specificity of performance is exhibited by the fact that expert proficiency can be disrupted by the presentation of random patterns such as those used by Chase and Simon (1973a). When presented with meaningless chess patterns, experts lost their rapid perceptual and representational ability and resorted to general problem-solving strategies.

Overall, the knowledge structure of experts when compared to novices exhibits: more concepts, more relations defining each concept, more relations interconnecting concepts, more robust relations for retrieving related concepts, and more procedures concerning how to perform in response to specific situations (Chi et al., 1981; Chi et al., 1982; Chi & Glaser, 1980; Glaser, 1987).

Summarizing the findings from the cognitive psychology investigations, Berliner (1987) reported that experts: (1) often make inferences about objects and events, whereas novices usually hold more literal views of those objects and events; (2) often classify problems to be solved at a relatively high level, while novices usually classify problems by surface characteristics; (3) when compared to novices, have fast and accurate pattern recognition capabilities; (4) are slower than novices in starting to solve a problem, that is, they seem to take longer examining the problem and building a problem representation; (5) build different problem representations than do novices; (6) when compared to

novices, show greater self-regulatory or metacognitive capabilities; and (7) build up competence slowly, over a considerable length of time with considerable practice.

Characteristics of Expertise in the Classroom

Findings relating to expertise in teaching have grown out of the expert/novice research literature, encompassing both ethnographic and empirical, as well as more traditional empirical approaches. Brophy (1986) reported that the most consistently replicated findings in research on teaching have linked student achievement to the opportunity to learn the material. Engagement rates depend on the teacher's ability to organize the classroom into an efficient learning environment where worthwhile academic activities are provided which run smoothly, transitions between activities are brief and orderly, and little time is spent in organization. If routines are well established, students will have more opportunity to learn because classroom events will be more predictable. Brophy (1987) maintains that effective routines reduce the students' need to seek direction and the teachers' need to make decisions or give specific instructions concerning daily events. Hence, the successful teacher reduces the complexities of the learning environment by establishing rules and management routines which allow instruction to proceed in a focused way (Brophy, 1987; Doyle, 1986; Leinhardt, Weidman, & Hammond, 1987; Yinger, 1978).

Findings from the classroom research have shown that the first days of a school year are extremely important in establishing and routinizing procedures. It is during this time that rules are announced and enforced (Clark & Elmore, 1979; Clark & Peterson, 1986; Emmer, Evertson, & Anderson, 1980; Evertson, 1985; Evertson & Anderson, 1981;

Evertson, Emmer, Sanford, & Clements, 1983; Yinger, 1978) and routines are rehearsed (Leinhardt, et al., 1987; Pittman, 1985). The results of these studies on effective classroom management suggest that the most important elements of management include: preparing the classroom as a physical environment suited to the nature of the planned academic activities; developing and implementing a workable set of housekeeping procedures and conduct rules; monitoring the quality of the students' engagement in activities and assignments; and monitoring the progress students are making toward achievement of intended outcomes.

The first day of school has always been considered vitally important. In 1907, in a classic text of classroom management, William Bagley states:

> The first day should leave with the pupils a distinct impression that work has begun in earnest, that no time has been "frittered" away, and that something definite has been accomplished (p. 29).

Bagley devoted three entire chapters to establishing and mechanizing class routines for efficient classrooms. His recommendations included the establishment of routines for: passing of lines; fire drills; signals; passing to the blackboard; passing to the recitation bench; distributing and collecting wraps, books and materials; leaving the room; and for neatness of written work and blackboard work.

Currently, attention is given to what routines are deemed important in expert teachers' classrooms and how experts divide or segment the time available for a lesson. The 1985 American Educational Research Association Presidential address by David Berliner, "In Search of the Expert Pedagogue" (Berliner, 1986) focused attention on

the expert/novice paradigm in education. This address indicated that expert teachers seem to have a special kind of knowledge which allows them to respond to classroom situations in different ways.

Central to the effort of identifying important characteristics of expert teachers has been the research of Leinhardt and her colleagues conducted mostly in the area of elementary mathematics (Leinhardt, 1983; Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985). Generally, findings indicated that expert math teachers used efficient routines and had a large repertoire of routines. A lesson taught by an expert was divided into logical segments called activity structures. Within each structure of the experts' lesson substantive content, a goal structure, and a consistent knowledge base were evident. In contrast, novice teachers showed varied patterns of behavior with few well-practiced routines.

Consistent with the early beliefs of Bagley (1907) concerning the importance of the early days of the school year, Leinhardt et al. (1987) studied six expert mathematics teachers to determine the routines and activity structures established during the first 4 days of school. Classes were videotaped and each routine coded as management, support, or exchange. The authors defined management routines as those which provide a classroom superstructure within which the social environment and behaviors are clearly defined and well known. Support routines specify the behaviors and actions necessary for a learning-teaching exchange to take place. Exchange routines define interactive behaviors that permit learning-teaching to occur. The most frequently used management routines reported were: pencil sharpening, lining up, "don't interrupt", and "no talking". The most frequently occurring support routines included: "take

out/put away supplies", paper formatting, teacher collecting/distributing, "wait to start", "open/turn to/ look at/close", and "keep busy when assigned work is finished". The most important exchange routines were: hand raising as a signal, teacher questioning with a "call until correct" response, teacher questioning with an individual student response, travel/check/monitor assigned work, and teacher questioning with a student choral response. The expert teachers in this study were videotaped again at midyear to determine if routines were still in place. It was found that a high percentage of the routines established during the first 4 days of school were still enforced at midyear and that these routines were considered important in the maintenance of the effective learning environments of these teachers.

More recently, researchers using the expert/novice paradigm in classroom research have focused on interpretations of situational classroom data. For example, Berliner (1987) and Carter et al. (in press) studied expert and novice teachers' perceptions of visual information about mathematics and science lessons. Following the viewing of slide presentations of actual lessons, subjects were asked to describe and discuss classroom management and instructional concerns. The expert teachers when compared to novices exhibited a rich store of classroom knowledge about students and events and were able to use that knowledge to understand and explain classroom phenomena. They were able to compare information viewed in the slides to their own classroom situations. In addition, they were cautious in their interpretations, often taking into account inferred variables which were not evidenced in the slides. The group of experts tended to focus more on the same events in classrooms and demonstrated more confidence in their

reactions to classroom management and instruction than did the group of novices. Moreover, the focus of the experts was on the notion of work, that is, students actively engaged in learning tasks. They showed concern over student learning to a greater extent than did the novices. The novices could provide a precise description of what they saw, yet did not have the depth of experience to provide multiple and often accurate interpretations. The recognition of fast and accurate patterns by the experts was also noted when compared to novice responses.

In a study by Hanninen (cited by Berliner, 1987), three groups of teachers of the gifted were compared in their analysis of five scenarios or case studies. Expert and novice subjects had to read and make recommendations for each case. Expert teachers reportedly used a higher-order system of categorization in their analysis of the situation presented to them. For example, when making recommendations about an active 8 year old child who enjoys reading, computers, and science but has a hearing deficit, one novice stated: "Mark seems like a very talented individual with many diverse interests". In contrast, an expert stated: "Mark's needs can be broken down into three broad areas--academic enrichment, emotional adjustment, and training to cope with his handicap". The novice simply used surface characteristics to make recommendations, whereas the expert analyzed the situtation in more depth. The results also reflected that the expert teachers when compared to novices were more thoughtful about students' needs. The author reported differences in mean times between experts and novices in the analysis of the problem and subsequent solution. This finding coincided with those reported in the cognitive psychology literature regarding the length of time experts take to structure a problem solving activity.

Expert/novice differences have also been evidenced by Carter et al. (1987). Expert and novice mathematics and science teachers and postulants (content matter experts from business with a desire to teach but with no pedagogical training) were presented an experimental task resembling an incident often encountered in a "real life" teaching situation. Each subject was asked to respond to the following scenario:

> Five weeks into the school year you are assigned an additional class to teach. The previous teacher has left abruptly, and her classes are being distributed among existing staff members. You are asked to assume responsibility for one of these classes.

Subjects were given a note left by the teacher, a grade book with grades and attendance records, student information cards containing demographic information on one side and teacher comments about the student on the other, corrected tests and homework assignments, and the textbook used by the former teacher.

The findings demonstrated that experts, novices, and postulants differed in: their attitude toward the processing of student information, their inclinations to accept as valid the information provided by the previous teacher, the ways they talked and thought about individual students, the kind and quality of solution strategies they proposed for classroom problems, their thinking about preparing to take over a new class, their routines for getting to know the students and for assessing what the students have learned, the types and amount of information they remembered about students, the amount and kind of attention they gave to test and homework information provided in the task, and the amount of time they allocated for examining information about students and for planning instruction.

Based on these results from the educational literature, differences exist between expert and novice teachers in their approaches to problem solving and interpretation of classroom events.

Expert/Novice Behavior in Physical Education

The study of effective teaching in physical education is a relatively new area of investigation and has for the most part relied on observing teaching behavior for short periods of time. Efforts to correlate process behaviors and achievement in physical education have been diverse and findings are somewhat inconsistent (Dugas, 1984; McEwen & Graham, 1982; Pieron, 1982; Silverman, 1985). Thus, research based conclusions about successful instruction in physical education are difficult to formulate. However, most physical educators who study teaching believe that the key to effectiveness is the teacher's ability to maximize the time students spend actively engaged in activities of an appropriate difficulty level and minimize the time spent waiting, making transitions, or engaged in misconduct.

Recent interest in the expert/novice paradigm has uncovered several teacher characteristics associated with competent performance in teaching physical education. The analysis of expertise in pedagogical physical education has focused mainly on the thinking processes of teachers as they plan for (preactive thinking) and teach lessons (interactive thinking). Research on teacher thought processes depends mainly on self reports obtained through think-aloud procedures (i.e., teachers speak into a tape recorder while planning) and stimulated recall procedures (i.e., teachers view their own teaching by videotape, reporting on cognitive processes).

Research on teacher thinking developed as an outgrowth of the process-product paradigm (Dunkin & Biddle, 1974) which emphasizes teacher behavior. The assumption underlying the studies of teacher thinking is that what teachers do is affected by what they think. Fennema, Carpenter, and Peterson (1987) maintain that the rationale for this perspective of the teacher was influenced by a report from Panel 6 of the 1974 National Conference on Studies in Teaching. The panelists argued that:

> It is obvious that what teachers do is directed in no small measure by what they think. Moreover, it will be necessary for any innovation in the context, practices, and technology of teaching to be mediated through the minds and motives of teachers. To the extent that observed or intended teacher behavior is "thoughtless", it makes no use of the human teachers' most unique attributes. In so doing, it becomes mechanical and might as well be done by a machine. If, however, teaching is done and, in all liklihood, will continue to be done by human teachers, the question of the relationships between thought and action becomes crucial (National Institute of Education, 1975 p. 1).

Since the publication of the Panel 6 report, research on teacher thinking has been a major focus in the field of education and to a lesser degree in physical education. Comprehensive reviews on teacher thinking have been published by Shavelson and Stern (1981) and Clark and Peterson (1986).

Teacher planning research conducted in physical education using the expert/novice paradigm has shown that experienced teachers request more information during planning and plan more comprehensively (Housner & Griffey,

1985; Howell, 1987; Taheri, 1982). Further, the experienced teachers in Housner and Griffey's study made more preactive decisions regarding instructional strategies to implement the activities. Metzler and Young (1984) studied lesson plans designed by an expert and novice physical education teacher and found that the different planning styles of the teachers affected student academic learning time in physical education (ALT-PE).

The expert/novice paradigm has been used by several researchers in physical education (Di Cicco, Housner, & Sherman, 1981; Housner & Griffey, 1985; Howell, 1987; Taheri, 1982) to study pedagogical cognitions during teaching. This effort to understand teacher action and the basis for decisions in physical education followed at least 10 years of classroom research on the interactive phase of teaching.

The results from the classroom literature (Clark & Peterson, 1986; Colker, 1982; Conners, 1978; Marland, 1977; Marx & Peterson, 1981; McNair, 1978; Morine-Dershimer & Joyce, 1979; Parker & Gehrke, 1986; Semmel, 1977) and from physical education (Housner & Griffey, 1985; Howell, 1987; Sherman, 1982; Twardy & Yerg, 1987) suggest that for all teachers a small portion of their interactive thoughts deal with instructional objectives and content of subject matter. A relatively large percentage of thoughts deal with instructional process including instructional procedures and strategies. The largest percentage of reported interactive thoughts are concerned with the learner.

In general, the research on teachers' thought processes to date substantiates that the teacher is a reflective, thoughtful individual and that teaching is a complex and cognitively demanding human process. Teachers' beliefs, knowledge, judgments, thoughts and

decisions strongly influence the way they teach and react in the classroom.

One noteworthy approach to the analysis of expertise in teaching physical education (Housner & Griffey, 1985) compared expert to novice teachers' interactive decisions. Housner and Griffey (1985) compared eight experienced and eight novice elementary physical education teachers in a laboratory setting. Using a stimulated recall interview (SRI), the authors classified teacher perceptions into two substantive categories: student behavior cues and teacher /context cues. The primary cues attended to by both the expert and novice teachers were student performance (30% experts; 19% novices), student involvement (27% experts; 23% novices) and student interest (12% experts; 27% novices). Hence, differences in interactive decision-making were found between experts and novices in regard to student performance and student interest.

Housner and Griffey (1985) conducted their experiment in a laboratory setting with only four students per teacher. Moreover, these students were not known to the teachers. In order to determine the ecological validity of this experiment, Howell (1987) examined preactive and interactive thought processes of expert elementary physical education teachers in the school environment. For the most part, the results corroborated findings of Housner and Griffey (1985). The majority of teachers' attention was allocated to students' performance (49.8%) followed by involvement (18.6%). Howell (1987) also reported 84% of alternative strategies that were implemented were based on student behavior cues, while 16% were based on teacher context factors. While these findings agree with those of Housner and Griffey (1985), they differ from the classroom findings which reported teacher context cues as the primary antecedent of

interactive decisions (Fogarty, Wang & Creek, 1982; Marland, 1977).

Howell (1987) reported a relatively small frequency of management decisions by the expert teachers studied. This finding conflicted with Housner and Griffey (1985) who reported that approximately 50% of the interactive decisions made by experienced teachers were related to management. Howell speculated that a possible explanation could be the ecological factor that the expert teachers studied knew their students, while those in Housner and Griffey's study did not. It is probable that rules and management routines had been established by the expert teachers with their classes at the beginning of the year.

Various models have been advanced by researchers to explain teacher interactive decision making. Shavelson and Stern (1981) suggested that teachers make deliberate actions when their routines are interrupted. Earlier explanations (Peterson & Clark, 1978) implied that decisions are made primarily when the teacher views the lesson as going poorly. Shroyer (1981) maintained that teachers make decisions or elective actions based on student occlusions. She defined a student occlusion as a student difficulty or unexpected performance. However, the high frequency of interactive decisions within individual lessons that have been reported in classroom research, for example, 24 decisions in 35 min (Wodlinger, 1980), would argue that any single explanation appears to be too limited in focus. In fact, Calderhead (1981) maintains that these models are overly constraining in that they assume student behavior to be the only antecedent condition for teachers' interactive decisions. Recently, Clark and Peterson (1986) supported Calderhead's claim and stated that before specifying a model for

teacher interactive decision making, more descriptive research is needed.

Overall, the findings from the current literature on teacher thinking has resulted in the development of new models for curriculum development. Figure 1 depicts a recent curriculum model developed by Fennema et al. (1987) which represents the way that teachers' knowledge base, beliefs, and decisions influence student learning. It is believed that what children learn is directly influenced by the decisions that teachers make.

Insert Figure 1 Here

Other Areas of Study Needed

Research on students' thought processes and perceptions of lessons examines how teaching or teachers influence what students think, believe, feel, say, and do which affects learning. Clearly, as shown in Figure 1, teaching influences student thinking and student thinking mediates learning, achievement and student action during instruction. It would seem likely that expertise in physical education instruction would include the skills needed to explain and demonstrate activities clearly. Following this line of argument, what students learn is determined in part by teachers' decisions which in turn influences students' cognitions. While there are certainly other variables involved in student cognition and learning (e.g., self-regulated strategies or motivation), teacher decisions should be considered and the expert/novice paradigm would be useful in studying this aspect of teaching.

Thus, students' perceptions of what is being taught is an important variable to consider. Often the instruction as perceived by the students may be different from what the teacher intended to be learned or the instruction may not be understood by the learners. A classic illustration of this point was given by Thomas (personal communication, 1984). When he asked his daughter, age 3, how high she could count, she stood up on the couch and extended her arm above her head and began to count. Obviously, the words "how high" held different meanings for the teacher and the learner. How frequently is this situation experienced in the classroom or gymnasium in which there are at least 20 or more children?

Although a number of classroom studies have been conducted to assess the effects of students' thoughts on achievement (Leinhardt & Putnam, 1987; Peterson & Swing, 1982; Peterson, Swing, Braverman, & Buss, 1982; Peterson, Swing, Stark, & Waas, 1984; Stayrook, Corno, & Winne, 1978; Winne, & Marx, 1982, 1983; Wittrock, 1978; 1986), none of these have approached the study of student thoughts from a expert/novice paradigm. For example, Winne and Marx (1983) studied students' perceptions of classroom instruction and their relation to achievement. Three cognitive processes were examined: orienting, which involves directing students' attention; operating, which includes comparing, generating, and using metacognition; and consolidating, which includes storage and retrieval. They reported that students' perceptions of instruction and the cognitive processes they used in response to it were related to achievement. Moreover, they found they could teach cognitive processes that would enhance achievement on objective but not essay tests.

In an earlier investigation by Winne and Marx (1982), students' and teachers' views of thinking processes in

upper elementary and seventh grade classroom lessons were studied. Lessons were videotaped, and SRI procedures were employed with both students and teachers. Teacher interviews were designed to obtain an account of what the teacher intended the student to be thinking, while student interviews described what they were actually thinking during instruction. Findings revealed a noticeable lack of one-to-one correspondence between what teachers had intended students to be thinking and the cognitive processes that actually occurred.

Peterson et al. (1982) and Peterson and Swing (1982) examined fifth and sixth grade students' reports of their cognitive processes occurring during mathematics instruction. Using an SRI procedure, student-reported attention correlated with achievement scores more highly than classroom observation of time-on-task. Further, student reports of using specific cognitive strategies, rather than global strategies such as thinking and listening, also correlated with achievement. The successful strategies included relating information to prior knowledge and also using motivational strategies. These findings were expanded in a later study by Peterson et al. (1983) which was conducted in a naturalistic environment with a more culturally diverse population.

Recently, Leinhardt and Putnam (1987) based a study of student cognition on the earlier work of Peterson and colleagues. They examined the complexities of the learning environment from the student's point of view and reported that a successful student must determine what actions are expected by the teacher and must grasp the intended content of the lesson, connecting and integrating that content with prior knowledge. These findings suggest that the way children adapt and learn involves a variety of cognitive competencies: an action system, a lesson

parser, an information gatherer, a knowledge generator, and an evaluator. The authors concluded that a successful student is one who is willing and able to learn and one who is actually contributing to his or her own learning of new material. Taken together, these findings emphasize the importance of examining the dichotomy between how we are teaching and the students' perceptions of the instruction in order to understand and explain phenomena related to optimal learning in the classroom. Still unanswered is the question of whether children taught by experts can grasp the intended content of a lesson easier than children taught by novices.

It is a difficult task to prepare teachers for the complexities of teaching and the school environment. Brophy (1987) states that teachers must possess propositional knowledge (concerning principles of effective classroom management) as well as procedural knowledge (how to implement these principles effectively) and conditional knowledge (when to implement them and for what reason) to achieve effectiveness in the classroom. This knowledge must be integrated with knowledge of subject matter and pedagogy for students to achieve. Systematic research is needed to study the development of a teacher's knowledge base and beliefs over time. Through systematic observation of the expert teacher, invaluable information may be obtained to benefit teacher preparation programs and to better understand how this knowledge structure is obtained. Shulman (1987) and Berliner (1986) have both commented that case journals such as those in law and the medical professions might be established through this line of study. In other professions, the intern has the advantage of consulting case journals when confronted with both routine and unique situations. Yet, in education, these valuable sources are not available.

Additionally, videotape libraries could be established which feature expert teachers in actual situations, establishing rules and routines, conducting difficult lessons and handling common discipline situations. The opportunity to observe and analyze "real life" models should provide valuable learning experiences for future teachers.

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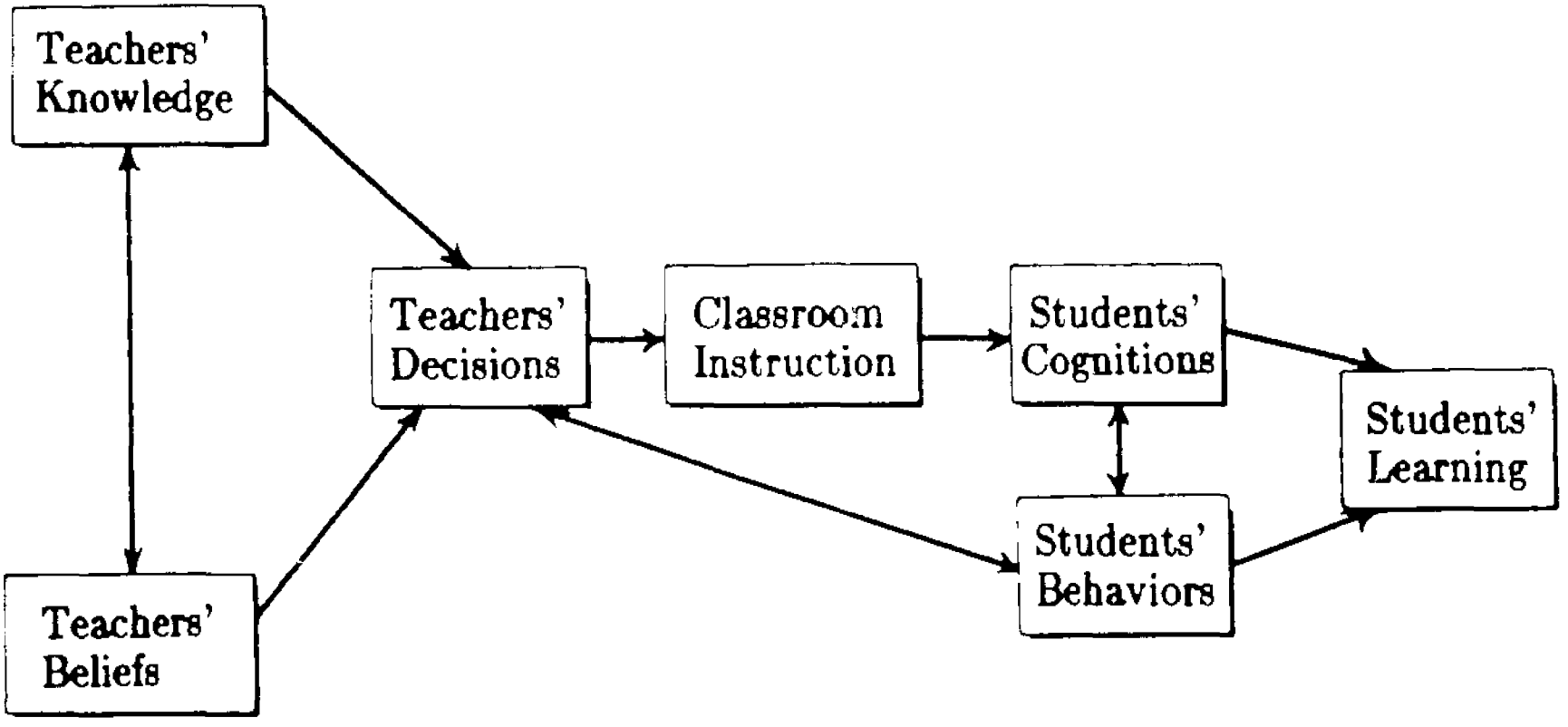
Figure Caption

Figure 1. A curriculum model based on teacher thinking research (Fennema et al. 1987)


Teachers' Knowledge
Teachers' Beliefs
Teachers' Decisions
Classroom Instruction
Students' Cognitions
Students' Behaviors
Students' Learning

APPENDIX B

Teacher Performance Assessment Information

CATEGORY I - KNOWLEDGE OF SUBJECT MATTER

Teaching behaviors in this assessment category indicate the extent to which the teacher demonstrates command of the subject matter taught during the lesson observed. The information gathered to make assessments in this category must reflect direct observation of what the teacher says or does relative to the content of the lesson.

There are two performance indicators in this category:

A. Subject Matter Content

B. Subject Matter Presentation

Indicator A requires the observer to first, recognize subject matter errors and second, to be able to give an accurate count of their frequency. Substantial errors include major misconceptions and information imparted to learners such as incorrect conjugation of verbs in a language arts class and using wrong units of measurement in a science class. Minor errors include such things as inaccurate dates and arithmetical slips. Observation of a substantial error or a number of minor errors reflecting a lack of subject matter knowledge is sufficient for denying credit for this indicator.

The second performance indicator focuses on the manner in which the content of instruction is presented during the lesson observed. The observer makes judgments about four teaching behaviors which reflect the timeliness and sequence of information/topics presented, teacher emphasis on important dimensions and applications of topics/activities and presentation of subject matter at a variety of cognitive levels.

The TADS-MTP FORM performance indicators and teaching behaviors for assessment Category I are included on the following page.

CATEGORY I - KNOWLEDGE OF SUBJECT MATTER

Performance Indicators and Sample Teaching Behaviors

*A. Subject Matter Content

1. Makes no errors indicative of lack of knowledge of subject matter taught.

*B. Subject Matter Presentation

1. Information is up-to-date and timely.

2. Important dimensions or applications of topics are utilized to enhance instruction.

3. Subject matter is presented at more than one cognitive or performance level.

4. Sequence of information presented is logical.

*Denotes Performance Indicator

CATEGORY II - TECHNIQUES OF INSTRUCTION

The teaching behaviors and performance indicators in this category of the TADS-MTP FORM define several key elements of an effective learning situation. First, instruction is presented at a level where learners can be successful. Learners are matched to lesson objectives through a variety of techniques and strategies, and materials and methods are chosen to accommodate the intellectual and developmental needs of the learners.

Secondly, instruction should be well-organized. Efforts should be made to present lesson activities in a sequential and orderly fashion with no missing links. Where media or other instructional aids and materials are used, their purpose should be to facilitate instruction.

Thirdly, communication, explanations and directions should be clear. Clarity of expression has been recognized as a critical element in effective teaching. Further, teachers should be sensitive to the need for additional explanation throughout a lesson so that clarification is provided whenever necessary.

Fourthly, instruction is an active process in which learners interact verbally and in other ways with the teacher, with each other and with varied learning materials. The teacher should facilitate and encourage interactions which are pertinent to lesson objectives. Additionally, a teacher should monitor the effectiveness of instruction, make adjustments if needed and provide feedback to learners about their performance and progress.

Nine performance indicators, each defined by four or more specific teaching behaviors, comprise this TADS-MTP FORM category. These indicators and teaching behaviors are presented on the pages that follow.

CATEGORY II - TECHNIQUES OF INSTRUCTION

Performance Indicators and Sample Teaching Behaviors

*A. Matches Instruction to Learners

1. Instruction is appropriate for the needs and abilities of the learners.

2. Learners have sufficient opportunity to practice lesson objectives.

3. Learners participate in two or more activities which require more than passive listening.

4. The teacher and the learner interact in more than one group size (i.e. class-sized groups, small groups or individual learners) ***or*** the teacher is responsible for only one learner.

5. The lesson is personalized for learners by using the learners' own experiences or by providing examples that are relevant to them.

*B. Aids are Used to Facilitate Instruction

1. Instructional aids (e.g., chalkboard, pictures, slides, or films, etc.) are appropriate for learners.

2. Instructional aids are appropriate for objectives.

3. Instructional aids are used at appropriate times in the lesson.

4. Instructional aids are used skillfully.

5. Instructional aids enhance accomplishment of instructional objectives.

*C. Materials are Used to Facilitate Instruction

1. Instructional materials are appropriate for the needs and abilities of the learners.

2. Instructional materials are appropriate for learner objectives.

3. Instructional materials are used at appropriate times in the lesson.

4. Supplemental and/or differentiated materials are used.

5. Instructional materials enhance the accomplishment of lesson objectives.

*D. Instruction Follows an Appropriate Sequence

1. Lesson is initiated with a motivating introduction.

2. Necessary background is or has been established.

3. Instructional components are sequenced in a logical order.

4. Lesson is closed appropriately.

*E. Clear Explanations and Directions are Provided

1. Learner attention is ensured before directions and explanations for lesson content are provided.

2. Explanations of lesson content are clear and easy to follow with appropriate vocabulary for learners.

3. Communication is precise with few false starts, interrupters or inappropriate qualifiers.

4. Major points or potential areas of difficulty are emphasized by verbal and or non-verbal cues and/or by repetition.

5. Examples and/or demonstrations are used to illustrate lesson content.

*F. Directions and Explanations are Clarified When Necessary

1. Areas of confusion are identified and communications restated before learners ask questions ***or*** no confusion is evident.

2. Attempts are made to clarify confusion which occurs ***or*** no clarification is needed.

3. Different words and ideas are used in clarification ***or*** no clarification is needed.

4. Clarifications are made for individual learners rather than the entire class when necessary ***or*** no clarification is needed.

5. Attempts to clarify explanations are effective.

*G. Opportunities are Provided for Verbal Interaction

1. Learners who try to contribute are acknowledged.

2. Comments, questions, examples, demonstrations and other contributions are sought from learners throughout the lesson.

3. Responses are sufficient to address learners' questions or comments.

4. Learners' ideas are elaborated in the lesson through extended wait-time or teacher comments and/or questions.

*H. Makes Informal Assessments of Learner Performance and Progress During the Lesson

1. Monitors learners' performance as learners engage in activity.

2. Solicits responses or demonstrations from learners for assessment purposes.

3. Multiple levels of learning are monitored where appropriate.

4. Learners evaluate their own and/or each other's performance.

5. Bases for learner difficulties or misunderstandings are sought ***or*** probing is not necessary.

*I. Information is Provided to Learners About Their Progress

1. Expectations about learner performance are communicated at the beginning of activities.

2. Specific feedback is provided to learners about inadequacies in performance.

3. Specific feedback is provided to learners about adequate performances.

4. Suggestions for improving performance are provided to learners.

CATEGORY III - CLASSROOM MANAGEMENT

This TADS-MTP FORM category assesses teacher performance relative to five important elements of teaching: 1) time devoted to instruction; 2) management of routine tasks; 3) pupil engagement in learning; 4) strategies used to manage off-task behavior; and 5) management of pupil behavior. These are important teacher concerns because they are related to the opportunity pupils have to learn and to pupil involvement in instructional activities. Research studies suggest that there are large variations in the amount of time teachers spend organizing children for learning as opposed to the amount of time pupils are engaged in some kind of instructional or learning activity. Inefficient teachers spend more time organizing for instruction than actually teaching.

The five performance indicators in this TADS-MTP FORM assessment category describe a classroom in which activities are well administered, academic engagement is high and pupils are able to understand expectations and work efficiently with little disruption. The five performance indicators in this category are

A. Most of the Observational Period is Devoted to Some Form of Instruction Rather than to Organizational Activities, i.e. Roll Taking, Distribution of Supplies/Materials and Regrouping for Instruction

B. Attends to Routine Tasks

C. Maintains Learner Involvement Throughout the Instructional Period

D. The Teacher Uses Strategies to Prevent, Identify and Redirect Off-Task Learners

E. Pupil Behavior is Managed Appropriately

Each of these performance indicators is measured by three or more specific teaching behaviors. The five performance indicators comprising TADS-MTP FORM Category III with their associated teaching behaviors are presented on the pages that follow.

CATEGORY III - CLASSROOM MANAGEMENT

Performance Indicators and Sample Teaching Behaviors

*A. Most of the Observation Period is Devoted to Some Form of Instruction Rather Than to Organizational Activities, i.e., Roll Taking, Distribution of Supplies/Materials and Regrouping for Instruction

1. Instructional activities begin promptly.

2. There are no unnecessary delays during instruction, (e.g., during transitions due to different completion times of group work or during routine tasks).

3. There are no undesirable digressions.

4. Instructional activities fit the allocated time period.

*B. Attends to Routine Tasks Effectively

1. Learner attention is ensured before providing directions or explanations for routine tasks.

2. Procedural directions necessary to implement the class activity are clear and complete (e.g., who, what, where, how).

3. Necessary materials are on hand and ready for use.

4. Routine tasks are dealt with in an efficient manner.

*C. Maintains Learner Involvement Throughout the Instructional Period

1. Approximately 85% or more of the learners are on-task throughout the lesson.

*D. The Teacher Uses Strategies to Prevent, Identify and Redirect Off-Task Learners

1. Stimuli for learners are varied by changing voice, movement, focus of attention, etc.

2. Active involvement is sought from learners who are involved only passively in instruction ***or*** no learners are only passively involved.

3. Non-verbal techniques are used to redirect learners who are persistently off-task ***or*** there is no persistent off-task behavior.

4. Verbal techniques are used to redirect learners who are persistently off-task ***or*** there is no persistent off-task behavior.

5. Efforts to redirect learners who are persistently off-task are successful ***or*** there is no persistent off-task behavior.

6. Techniques are used to maintain the attention of learners who have been redirected ***or*** there is no persistent off-task behavior.

*E. Pupil Behavior is Managed Appropriately

1. Expectations about behavior are made clear to learners ***or*** learner behavior indicates that expectations have been made clear.

2. Consistent expectations about behavior are maintained throughout the lesson.

3. Behavior of the entire class is monitored throughout the lesson.

4. Learners are provided verbal and/or non-verbal feedback about specific behavior(s).

5. Learners who interact inappropriately or otherwise interfere with the work of others are identified and dealt with quickly ***or*** learners do not interfere with instruction.

6. Learners who interact inappropriately or otherwise interfere with the work of others are dealt with appropriately (i.e. firmly and with suitable consequences) ***or*** learners do not interfere with instruction.

CATEGORY IV - TEACHER-STUDENT RELATIONSHIPS

The teacher's interpersonal behavior with students has a significant influence on whether teacher-student relationships will be positive. The teacher demonstrates respect for and fairness with learners by including all learners in lesson activities, assisting learners who have difficulty and providing personalized feedback to learners who do well. A comfortable and positive interpersonal learning environment is also promoted by demonstrating warmth and friendliness with and among learners, by showing patience and empathy and demonstrating enthusiasm for teaching, learning and the subject being taught.

In teacher-student relationships, there is allowance for a wide range of ways of interacting. The obviously negative ways of relating to and interacting with other human beings, if exhibited by the teacher, are sufficient cause for denying credit for performance in this TADS-MTP FORM category. This category addresses the social and emotional dimensions of the classroom environment and the teacher's attempts to stimulate and maintain a positive learning climate. The criteria for judging teacher-student relationships are built around a concept of fairness and impartiality to all students regardless of race, social class, ability level, sex or religion.

Three performance indicators comprise this category:

A. Systematically Attempts to Involve All Learners in Class Activities

B. Promotes a Positive Interpersonal Environment

C. Demonstrates Warmth and Friendliness

Each of these performance indicators is assessed by four or more specific teaching behaviors. The TADS-MTP FORM Category IV performance indicators and teaching behaviors are presented on the following page.

CATEGORY IV - TEACHER-STUDENT RELATIONSHIPS

Performance Indicators and Sample Teaching Behaviors

*A. Systematically Attempts to Involve All Learners in Class Activities

1. Learners are provided equal opportunities to participate in class activities.

2. Learners who respond poorly or who have difficulty are encouraged.

3. Involvement is sought from learners who appear reluctant to actively participate ***or*** there is no necessity for such encouragement.

4. Learners who do well are personally/individually recognized for specific performances.

*B. Promotes a Positive Interpersonal Environment

1. Fairness and impartiality are demonstrated when dealing with learners.

2. Patience or empathy or understanding is demonstrated when learners respond poorly or have difficulty.

3. Comments to or about learners are free of demeaning sarcasm and personal ridicule.

4. Establishes a climate of courtesy and respect.

5. Enthusiasm is communicated for teaching, learning and the subject being taught.

6. The importance of topics to the content area or to real life is stated to learners.

*C. Demonstrates Warmth and Friendliness

1. Warmth and friendliness are demonstrated by a positive tone of voice and eye contact which accompany verbal interaction(s) with learners.

2. Warmth and friendliness are demonstrated by knowledge and use of student names.

3. Warmth and friendliness are demonstrated by smiling, laughing or demonstrating a sense of humor.

4. Warmth and friendliness are demonstrated by sitting or standing near students.

Table B-1

Teacher Performance Assessment Ratings

Teacher	Observer #1 (Investigator) Day 1	Observer #1 (Investigator) Day 2	Observer #2 (External) Day 1	Observer #2 (External) Day 2
Experts				
M-1	72	74	75	76
M-2	78	79	77	77
E-1	80	80	81	80
E-2	75	76	77	76
Novices				
M-1	37	21	36	22
M-2	44	40	46	42
E-1	48	42	50	44
E-2	63	62	60	60

Note. E = Elementary level; M = Middle School Level

Interrater Reliability

Evaluation of Teacher Performance

Two videotaped lessons for each teacher were independently coded by two trained evaluators. Each sub-category of the teacher performance assessment instrument was compared. Reliability was estimated by the following formula:

$$\frac{\text{\# of agreements}}{\text{\# of agreements + \# of disagreements}} \times 100\%$$

Teacher Interactive Thoughts and Student Cognition Interviews

Three of the 24 teacher interviews and three of the 24 student interviews were analyzed independently by two trained coders. These were randomly selected from interviews coded at the beginning, middle, and end of data anaylsis. Each subcategory was compared using the formula presented for teacher evaluation reliability.

Table B-2

Interrater Reliability for Teacher Performance Assessment for Lesson One

	Teacher							
	EE-1	EE-2	EM-1	EM-2	NE-1	NE-2	NM-1	NM-2
1A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2A	.80	1.00	.80	1.00	1.00	.80	1.00	.80
2B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2D	1.00	1.00	1.00	.80	.80	1.00	.80	1.00
2E	.80	1.00	1.00	1.00	.80	.80	1.00	1.00
2F	.80	.80	.80	1.00	1.00	1.00	1.00	1.00
2G	1.00	1.00	.75	.75	1.00	1.00	1.00	1.00
2H	.80	.80	.80	1.00	1.00	1.00	.80	.80
2I	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3B	.75	1.00	1.00	.75	1.00	1.00	1.00	1.00
3C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3D	1.00	1.00	1.00	.83	.83	1.00	1.00	.83
3E	1.00	1.00	1.00	1.00	1.00	1.00	.83	1.00
4A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Note. EM = Expert Teacher Middle School Level
EE = Expert Teacher Elementary Level
NE = Novice Teacher Elementary Level
NM = Novice Teacher Middle School Level

Table B-3

Interrater Reliability for Teacher Performance Assessment for Lesson Two

	Teacher							
	EE-1	EE-2	EM-1	EM-2	NE-1	NE-2	NM-1	NM-2
1A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2A	1.00	.80	1.00	.80	1.00	1.00	1.00	.80
2B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2D	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2E	1.00	1.00	.80	.80	.80	1.00	1.00	.80
2F	.80	.80	1.00	1.00	.80	.80	1.00	.80
2G	1.00	1.00	1.00	1.00	.75	1.00	1.00	1.00
2H	.80	.80	1.00	1.00	1.00	.80	1.00	.80
2I	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3B	.75	.75	1.00	1.00	1.00	1.00	1.00	1.00
3C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3D	1.00	1.00	1.00	1.00	1.00	.83	1.00	.83
3E	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4B	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Note. EM = Expert Teacher Middle School Level
EE = Expert Teacher Elementary Level
NM = Novice Teacher Middle School Level
NE = Novice Teacher Elementary Level

APPENDIX C

Interactive Teaching Interview Information

STIMULATED RECALL INTERVIEW PROCEDURE FOR TEACHERS

Instructions given at the first interview session:

I am interested in what you were thinking while you were teaching this lesson--especially what you were thinking as you decided what to do next at various points in the lesson. As I play back the lesson, please tell me to stop the tape whenever we reach a point where you were consciously saying to yourself, "Let's see, I think I'd better do this now," or "I guess I'll try doing this". I may stop the tape myself at a couple of points, but you should tell me to stop it whenever there is a point in the lesson whre you made a specific decision about what to do next in the lesson. There are no right or wrong answers. I am interested in what you were thinking. Any questions?

When the tape was stopped by the teacher, the following questions were asked:

What were you thinking at that point?

Are you noticing anything in particular at this time?

Was there anything you thought of doing at this point, but decided against it? (If teacher responds yes, without elaboration, ask what was it?)

.....

One additional question was asked which would be used in a separate data analysis:

What did you want your students to be thinking about at this point in the lesson?

This last question was asked to compare to student interview responses of what they were really thinking during instruction.

The interviewer stopped the tape if the teacher did not only when the teacher changed activities during instruction (e.g., changed group drills; started a new activity)

Decision Log for Teacher's Interactive Thinking

General Instructions

When coding a transcribed interview, examine an entire segment of thought before making category decisions. A segment consists of one complete cycle of questioning. If within one interview questioning segment, the teacher repeats the same thought to emphasize your understanding of their actions, only code the thought pattern once. However, within the next segment, if the teacher's focus is still on the previous thought pattern, code it for that segment. Mark your categories in the margin and following the coding, record notes regarding any statements which did not fit into a category. In addition, record sequences of thought patterns that were noted.

Part One. Decisions

The teacher makes a conscious decision during the lesson segment.

Supplementary. The teacher makes a decision which is implemented but is not part of the original daily lesson plan. Example: "I just decided to talk to the students about their lazy behavior as far as dressing appropriately for class. I had not planned on it, I just decided to do it".

Pupil-related. The characteristics or behavior of a pupil, a group of pupils, or the class become the basis of the teacher's decision. The behavior may be skill related or management oriented. Example: "I saw that the kick really wasn't a chip kick, it was a full kick, and it went on past me, so I just told them to go ahead and line up on the other line rather than cause confusion and have them line up like I had originally intended". (Note: The

entire decision was made due to an unexpected student behavior, that is, an incorrect skill behavior)

Plan-related: Teacher reports a decision to behave in a particular way, based chiefly upon the original goals/plans or the lesson. Example: "Ideally, I wanted to take my first two groups, but suddenly there was more than I was anticipating and I'm just kind of stuck. At that point, I decided that I'm not going to be able to take two groups at a time to go with me because I wasn't going to have enough equipment". (Note: the teacher makes reference to groups of students, but the entire statement refers to a decision made due to change of original plan.)

NOTE: PLAN-RELATED AND PUPIL-RELATED DECISIONS MAY BE MADE SIMULTANEOUSLY. IF SO, CODE BOTH.

Example: "Before, I do the demonstration which is next, I would have like to have used Troy and Ira to demonstrate because they weren't paying attention, and I could have brought them into the lesson, but because I had used them last week to demonstrate, I wanted to get a new person to do it this time. That's what was really going through my mind, who I wanted to pick".

Explanation of Events. This is, technically, not a decision. The teacher simply explains what he/she was thinking about or what was happening at that point in the lesson. Example: "The line is a little sunken in so I just have to keep reminding them to put the ball up off the little gulley".

Part Two. Concerns

Events which occur that the teacher expresses concern.

Pupil Behavior/Attention. Teacher comments on student behaviors such as paying attention during

instruction. Example: "I was noticing that Tim and Joe were looking in the other direction. They were looking away, so I was trying to get their attention back to me".

Pupil Attitude. The teacher's attention is on the feelings that pupils may be experiencing. Example: "He needed some kind of reinforcement. He really feels frustrated here".

Pupil learning-declarative knowledge. The teacher is concerned with pupils learning the knowledge of facts and concepts. Example: "I wanted the students to know that the approach is the same, but where you contact the ball is going to be different to make the ball do different things".

Pupil learning-procedural knowledge. The teacher is concerned with pupils learning how to perform/execute/do something. Example: "I wanted the kids to think about the proper technique that I had taught, mostly lock your elbows, bend their knees, watch the ball...all the cues that you know, I had given them".

Pupil learning-strategic knowledge. The teacher is concerned with pupils' knowledge of general rules which may be generalized across knowledge domains. Example: "I want the kids to be thinking about the serve, but other than that, I wanted them to think about hitting the ball legally and maybe setting it up, trying to use more than one hit..think about teamwork, calling the balls, giving each other suggestions".

Procedure-Management. The teacher's attention is on measures used to engage the pupils, keep them on task, or get them involved in the lesson or measures used to discipline the pupils. Example: "I was thinking, "was it a good idea to put the jump ropes out or should I have left them in a box, because, uhm, and let them come up row by row to get them, because it tended to be a problem to

have them out because the kids wanted to play with them, so that took my time to discipline them to stop".

Procedure-Instruction. The teacher's focus is on instructional routines being used in the lesson. Example: "I was thinking, that I cannot do this skill well myself, I was thinking how am I going to get this demonstration to make them understand".

Procedure-Organization. The teacher's focus is on the organizational routines regarding grouping, formations, spacing; anything related to the procedural organization of the activity. Example: "At this point, I'm trying to make the teams even up, the groups even, so that when they're doing the next drill, I'm going to be splitting them up".

Procedure-Equipment/Facilities/Extraneous Variables: The teacher's concern is related to equipment/facilities or outside variables such as environmental factors (i. e., rain, etc.). Example: "I was going to have to do some juggling around of the equipment, because I was short of jump ropes".

Pacing: Pupil-related. Teacher comments on the timing of activities or speed of content coverage in a lesson, giving pupil characteristics as the principal reason for what is occurring. The teacher might comment that pupils were not moving through a drill or activity as quickly as he/she hoped. Example: "I'm thinking, that what does it matter to Donna if she's first or second, but I just said, well, let me please her, because I wanted to go on with the drill; I didn't want to take time off with her..I kept thinking, this drill can go faster, faster..".

Pacing: Plan-related: Teacher concerns with the timing of lesson or or speed of content coverage in a lesson as planned by the teacher. Example: "I had to almost start over and explain half of another lesson, so I

was a little worried about my time; trying to rearrange it".

Part Three. Information Source.
Cues used by the teacher to govern thoughts/decisions/ actions.

Observation-verbal. This relates to a teacher's thought based on an observation of pupils' verbal behavior. Example: "Someone asked me a question, and said, "Which foot?", and I hadn't thought about it until then, so I said, "either one".

Observation-skill performance. Observation of a pupil's skill ability or performance of activity. Example: "I noticed that a lot of the kids were missing the serve, so I thought I should give them a second chance".

Teacher expectation. Pupils' behavior or learning which, because of his/her previous knowledge of the class or some other reason, the teacher expects in the course of the lesson. Example: "I wanted to make sure there would be an even number, because if there's one person odd, when it gets to be their turn, they're going to say, "I don't have anyone to go with" so I was trying to avoid that problem".

Teacher Hunch. This refers to the assumptions or guesses that come to the teacher in the course of the lesson. Example: "I ran into a problem right there because they still don't realize what to do, or maybe I didn't explain myself well enough last week or during this lesson, so they that might be why they didn't realize what to do".

Teacher Recall. This relates to references made, by the teacher, to previous information or events related to

the present lesson content, procedure or the pupils. Example: "I knew, just based on the times the way the groups had been going from earlier in the day, I knew that I needed to do that".

Part Four. Awareness.
Events that occur in the lesson for which the teacher becomes cognizant.

Principles of Teaching. This refers to general rules that the teacher becomes mindful of and follows in a certain type of situation. Example: "I realized that my groups that were partner passing had big long lines which they shouldn't have had".

Teacher Feelings. This refers to emotions the teacher experiences at a particular point in the lesson. "I was thinking, this is going to be great, I'm going to mess up in front of these kids here".

Alternatives. These are other techniques or procedures that the teacher becomes aware of which could be used in place of the one actually used in the lesson. Example: "I was thinking about maybe going ahead and have two groups with me but I decided against it because there wasn't enough balls".

Teacher Behavior. These are acts by the teacher, which seem to be more than the ordinary and of which he/she becomes aware. Example: Since I had only gotten the chip shot about three times, I had to concentrate on what I was doing to make this go the right way".

Interactive Thinking Coding Sheet

Part One. Decisions Total %

Pupil Related

Plan Related

Explanation of Events

TOTAL FOR PART ONE: _____ _____%

****

Part Two. Concerns.

Pupil Behavior/Attention

Pupil Attitude

Pupil Learning-declarative knowledge

Pupil Learning-procedural knowledge

Pupil Learning-strategic knowledge

Pacing: pupil-related

Pacing: plan-related

Procedure-Management

Procedure-Instruction

Procedure-Organization

Procedure-Equipment/facilities/

TOTAL FOR PART TWO: _____ _____%

Part Three. Information Source. Total %

Observation-verbal

Observation-skill performance

Teacher expectation

Teacher hunch

Teacher recall

TOTAL FOR PART THREE: _____ _____%

****

Part Four. Awareness.

Principles of Teaching

Teacher Feelings

Alternatives

Teacher Behavior

TOTAL FOR PART FOUR: _____ _____%

****

OVERALL TOTAL:

RECURRING SEQUENCES OF THOUGHT PATTERNS:

COMMENTS (INCLUDE ANY STATEMENTS WHICH DID NOT FIT INTO SPECIFIC CATEGORIES WHICH YIELDED ADDITIONAL INFORMATION):

November 18, 1987
IDM-Observation #3

Two soccer fields were marked off and the children played in four teams throughout the class time..Randy officiated between the two fields
Interviewer stopped tape when children had completed warm-up exercises and were running while Randy distributed equipment
What are you thinking?
Just trying to get set up to be organized when they get back
Were you noticing anything?
No, not really
Was there anything you were thinking about doing, but decided not too?
No, just when they finished that they would line up by their teams and then we'll go from there
What do you want the kids to be thinking about here?
I want them to remember what team they are on. They want to think colors but we change colors everyday. Team numbers stay the same but the colors change. A lot of them want to go with the same color they had the day before.

Randy stops the tape when the kids are being divided up into two teams and some of the kids are coming up to you.
What are you thinking?
They didn't know what team they were on and it gets worse. Nobody knew what team...two teams were fine..no problem, but the other two teams didn't know and I didn't know either ... I had to look on the paper to see who was supposed to be where..just a little confusion and it took a little time to get it straightened out and it was mostly

because of the color vs. the number..they wanted to be the same color so they grabbed the shirt and ran without thinking about what I had said and I had to stop and get it straightened out. In fact, all of those, I had to stop them..one field was set up and ready to go and then I had to stop the other two teams and get them reorganized.
What were you noticing?
Because they came up and started asking me and they were saying, I'm on this team....
Was there anything else you thought about doing but decided against it?
No, I just had to stop and totally redo it so it would go faster
What do you want the kids to be thinking about?
Trying to remember what team they were on and listen to me

I noticed that little girl comes over to you about four times during the class...
Right there she wanted to be goalie. I said, "just wait, go over with your team, I'll be there as soon as I can". I can only do one thing at a time. She's a smarter one, she knows what's going on; I noticed some kids that were playing that were supposed to be on the other field.
So what did you do?
I just said, "hey, you're supposed to be over here" and just pulled them off.

Stopped when both teams were nearly set up ready for play:
What are you thinking?
Just trying to get them set up ... I had to make sure they got the ones in the front and the ones in the back because they have lines to follow. On one team, it looked like we didn't have enough players, so I let them just play wherever they wanted to on the field.\

What are you noticing?
Just watching them play, trying to see how they're playing I'm refereeing..if it goes out of bounds, I was calling who it went out on to throw it back in
Is there anything you thought of doing but decided against it?
No, just make sure they get their throw in right. I have to keep reminding them, because they forget.
What do you want the kids to be thinking?
Just doing it right...
The throw in..or ...
Just the whole thing, but the throw in specifically

Randy stopped the film when during the game play he had the kids do a penalty kick for the first time:
What are you thinking?
I'm showing them something new here. Anytime, it hits a cone (in the goalie area), one of our rules was no goal. And, what I let them do, this is a new...something I never showed them before, called a goal kick. I let the goalie kick it out of there and they had never really seen it before so I went up there to show them what to do. I just wanted to let them see what it was and do it in a game situation so the next time it happens, they'll know how to do it.
What were you noticing?
I just knew they didn't know what to do. Either the goalie was going to take it and throw it or kick it or whatever and I had been doing it with the older classes and I wanted to go ahead and get it in with this younger class
Was there anything else you thought of doing at that time but decided against it?

I could have just let it go, but I decided to do it since they, they really hadn't had any experience with the ball hitting the cone so it's kind of a new thing for them.
What did you want the kids to be thinking?
Just learning the rules by playing
I pretty much let the kids decide their positions on their own and if there is any arguing, then I decide.

We stopped the tape when a student from one field comes to get Randy because of a pushing foul:
What are you thinking?
That I didn't see it and I don't know what was going on and if there's a lot of arguing, I'll have to stop it (the game), if not I'll just let them play..I'll say, "ok, red ball take it in" or something like that; just start the game back up and get it going
Was there anything you thought of doing here, but decided against it?
No, just keep the game going, let them get in as much as they can
What do you want the kids to be thinking?
Playing, playing...I want them..we stress sportsmanship, no arguing, in fact, if they argue after the game is over, they can forfeit whether they're bragging or if they're complaining. They don't bring it into the classroom. If they bring it into the classroom, the teacher knows that they aren't going to play soccer the next day, if they do that, so the classroom teacher helps out as well.

A little boy is hit in the face with a ball that is being thrown in:
What are you thinking here?
I'm hoping that he's not hurt..most of them, they're not, they'll get popped and it stings a little bit, but what I

noticed is that he threw the ball from the middle of the field and there's no reason for him to be doing that. He should have been out on the side and I didn't know what he was doing, so I had to go over there and show him and straighten him up and the guy who got hit in the head, there was no problem, so let him go..

Was there anything you thought of doing, but decided not too?

Well, I could have jumped all over him, for throwing it, but it was an accident, so I just let it go.

The little boy seemed fine..Yeah, he said, "I headed the ball!"

What did you want the kids to be thinking?

Just playing

Table C-1

Intended Student Cognitive Processes for Elementary and Middle School Teachers

	Middle School		Elementary	
	n	%	n	%
Pupil Attention	37	16.2%	39	21.5%
Pupil Attitude	9	3.9%	6	3.3%
[a]Pupil Learning	51	28.1%	66	28.9%
Declarative Knowledge	10	6.1%	19	10.5%
Procedural Knowledge	34	16.2%	37	11.0%
Strategic Knowledge	15	6.6%	12	6.6%
Procedures-Management	33	14.5%	22	12.2%
Procedures-Instruction	17	7.5%	10	5.5%
Procedures-Organization	43	18.8%	26	14.4%
Procedures-Equipment	1	.5%	6	3.3%
Pacing-Pupil Related	4	1.8%	7	3.9%
Pacing-Plan Related	18	7.9%	14	7.8%

Table C-2

Interrater Reliability for Teachers' Interactive Thoughts

	Lesson		
	1	2	3
Decisions			
Supplementary	---	1.00	---
Pupil-Related	.80	.80	.83
Plan-Related	.80	.83	.80
Concerns			
Pupil Attention	1.00	.80	.80
Pupil Attitude	.83	.80	.80
Pupil Learning			
Declarative	.80	.80	.83
Procedural	.83	.83	.83
Strategic	1.00	.80	.80
Pacing: Pupil	1.00	.80	.83
Pacing: Plan	1.00	1.00	.80
Procedure-Mgmt	.75	.80	.80
Procedure-Inst	---	---	1.00
Procedure-Org	---	1.00	.80
Information Source			
Obs.-Verbal	---	1.00	---
Obs.-Skill	1.00	1.00	.83
Teacher Expect	---	.80	---
Teacher Recall	1.00	---	.80
Awareness			
Prin of Teach	.80	.80	---
Teacher Feeling	1.00	1.00	---
Alternatives	1.00	1.00	.80

Note. Categories with slashes were not observed for that interview.

Table C-3

Intrarater Reliability for Teacher Interactive Thoughts

	Lesson		
	1	2	3
Decisions			
Supplementary	---	1.00	---
Pupil Related	1.00	1.00	1.00
Plan Related	1.00	1.00	1.00
Concerns			
Pupil Attention	1.00	1.00	1.00
Pupil Attitude	1.00	1.00	1.00
Pupil Learning	1.00	1.00	1.00
Declarative	1.00	1.00	1.00
Procedural	1.00	1.00	1.00
Strategic	1.00	1.00	1.00
Pacing: Pupil	1.00	1.00	1.00
Pacing: Plan	.83	.86	1.00
Procedure-Mgmt	.86	1.00	1.00
Procedure-Inst	---	---	1.00
Procedure-Org	---	1.00	1.00
Information Source			
Obs-Verbal	---	1.00	---
Obs-Skill	1.00	1.00	1.00
Teacher Expect	---	1.00	---
Teacher Recall	1.00	---	.86
Awareness	1.00	1.00	1.00
Prin of Teach	1.00	1.00	---
Teacher Feelings	1.00	1.00	---
Alternatives	1.00	1.00	1.00

Note. Categories with slashes were not observed for that interview.

APPENDIX D

Student Stimulated Recall Interview Information

STUDENT INTERVIEW PROCEDURES

Directions to Students: You are going to be watching yourself and your classmates on television, so I know this is going to be fun for you. However, it is very important for you to listen to me and the questions that I'll be asking you. I want you to pretend like you were in this class, and try to think just the same thoughts you were thinking at that time. Please be very serious and give me your most honest answers because they are very important. You are specially chosen to take part in this research because I knew you would be good during these interviews. Remember that you will not be punished for any answers that you give me, so please answer the questions real honestly. Do you have any questions? Okay, let's watch a few minutes of your lesson and you try real hard to remember how you were thinking during this lesson. Now, as I come around to you with the tape recorder, speak loud and clear so that I can understand what you are saying. (At the beginning, let children say their name and favorite sport or tv show and then play back the tape so they can hear how they sound...they love to hear themselves, but this allows the investigator the chance to make sure all students are speaking clear enough and to double check that batteries, etc. for equipment are operable)

QUESTIONS

1. Describe what you were thinking about during this part of the lesson.

2. Did you understand the activity (material..skill.. explanation...demonstration, etc.); at this time?

Yes

No

Can you tell me what you were having trouble understanding?

What could the teacher have done to make this clearer to you?

3. What things did the teacher do to help you understand?

4. Did you understand why the teacher was _____ (explaining, demonstrating, ...the activity, drill, etc.)?

Yes

Why did she/he do that?

No

5. Is there a better way to learn the activity?

November 18, 1987
Observation #3-Student Interviews

Stopped tape after students had exercised and (Student) had received his President's Physical Fitness Award in front of the class. They came back and lined up in their teams.

What are you thinking about?

Stu1: I'm thinking about soccer; getting to play
Stu2: I'm thinking about winning a patch
Stu3: I'm thinking about winning a patch
Stu4: Winning a patch and running the track. I like it and try to beat everybody
Stu5: Playing soccer and all...if we're going to win
Stu6: To try to do better in pe to get the patch
Stu7: I was thinking about being good enough to be the student of the week
Stu8: Running and trying to get the patch

Did you understand why Mr. XXXX has you exercise and run at the beginning of class?

All answered yes

Why?

Stu3: so it will stretch you out and you can run better
Stu4: so you can get the patch
Stu2: so you'll feel good when you run
Stu1: so you'll play good in soccer
Stu5: so you're not so tired and all
Stu6: so you can get good exercise and all that
Stu7: so you can stretch and all, so you'll be ready to play
Stu8: keeping you in shape

What are some of the things Mr. XXXX does to help you understand?

Stu4: The way he tells it to us

How?

Stu4: Like he make us do it right, like if we mess up, he'll make us run

Stu5: Well, he explains it so I can understand it

Stu6: the way he explains it

Stu7: the way he explains it, because he kind of does it slow, like if he is telling us like to run to the cones and stuff, he'll ask at the end of what he's telling us, he'll ask us if anyone has any questions about it and all

Stu8: Like if you do something wrong, he'll be there to tell you if you don't understand

Stu3: he takes it step by step

Stu2: he does it slowly so we can understand

Stu1: he tells us and then he asks, does everybody understands

If you were the teacher for the day, would you do anything differently about the warm-ups to help the children learn this activity better?

Stu7: uhm, I'd teach it like him, because he teaches it good to make sure everybody understands

Stu6: well, I would teach it like him, because he teaches it real good and makes sure everybody understands it

Stu8: I'd teach it like him

Stu4: I'd make them run the track more

Stu3: I would try to get as much in as I could, so they could start playing a lot sooner

Stu2: I'd make them do lots of exercises

Stu1: I would teach them more exercises and more stuff to do

Students viewed tape of teams dividing up to the two different fields.

Did you understand where you were supposed to go?

Two answered that they were confused

Stu6: Well, he, when he said that we had to, when he said which jerseys to put on, I put on the green and he kept saying we were supposed to be yellow and it confused me and then he finally got it straight and said we were green and I already had on a yellow one.
Stu2: Whenever he was talking about the jerseys I didn't understand what he was saying because he was saying he started to say green and then I thought it was green with the holes in it and then he said Crystal and the other one.
What would you do to help the children understand about the jerseys?
Stu2: I would tell them over and over again
Stu1: I would just get, tell them all, I would call out the names, then I would tell them to go, go into one group, and then keep on doing it and then tell them to get a certain jersey
Stu4: I would mark them
Stu5: I would put all the jerseys in one pile and put, uhm, put ever how many people that's on one team, put them in a certain group and I'd call out the color jerseys that they had to go and get them
Stu6: I would get them all quiet and tell them to listen carefully and I would say it slow enough to where they could hear me and understand

The children watched several minutes of their game play activity.
What were you thinking about?
Stu7: I was thinking about me getting a goal and scoring a lot of points and all for my team
Stu6: I was thinking about, uhm, my team winning and just getting a lot of goals to make our team win

Stu5: I was thinking about scoring a bunch of goals so my team could win
Stu4: Winning
Stu8: I was thinking about being a great sportsman.
Stu8, I noticed that during the game you got kind of angry, what was that about and what were you thinking?
Stu8: because I had to stay for defense and I wanted to score goals
Stu3: I was thinking about trying to play defense and trying to chip kick it all the way to the goal and scoring
Stu2: Winning
Stu1: I was thinking about everybody scoring five goals on our team to win
Did you understand the activity at this time?
Stu2 responded no
Stu2, what didn't you understand?
Stu2: when coach said I was supposed to lead..on the kick off..I didn't know how to do it.
Stu6: I didn't understand when I had to try to kick the ball when I was running around and trying to get the ball from this boy and I didn't understand because when I got in front of him, I took the ball and this boy in the green came up to me and kicked it over to the side of the goalie and when I went to get it, somebody came over and got the ball, and I was just walking around, "where is the ball?"...I couldn't find it.
For those of you who understood, what are some of the things Mr. XXXX did to help you to understand?
Stu8: Uh, he would, uhm, like we practiced it before we played a game
Stu1: Uhm, he told me which place to play in and he told me where to kick the ball and everything
Stu2: He's teached me how to kick it and he's explained you can't use your hands..it's a kicking game

Stu6: He helped me understand how to kick it and dribble it and everything and not use your hands unless it goes out of bounds If you were teaching this activity, what are some things you would do to help the children understand the activity better?

Stu4: the same way

Stu8: I'd teach that you can't use your hands...the same way

Stu3: Have them practice first and then play...like he did

Stu7: I would teach it the same way except I would say it a little bit slower

Stu6: I would teach it the same way except I would explain it a little bit better..try to you know, get them to understand because a lot of them get confused

Stu5: I would make sure that everybody really understood what I was saying so they would understand how to play the game.

How would you do that?

I would go over everything step by step, and uhm, after I said each thing I would ask everyone if they had any questions

Stu1: I would tell them which side is which and tell them what to do.

Table D-1

Student Thoughts Regarding Ways Elementary and Middle School Teachers Help Them Learn

	Elementary		Middle School	
	n	%	n	%
Demonstration	62	28.1%	36	23.8%
Explanation	65	29.4%	69	45.7%
Review	12	5.4%	8	5.3%
Individual Feedback	24	10.9%	17	11.2%
Task Analysis	16	7.2%	7	4.7%
Provided Handouts/AVs	7	3.2%	3	2.0%
Participated With Us	9	4.1%	0	---
No Reply	20	9.0%	4	2.6%
Other	6	2.7%	7	4.7%
TOTAL	221	100.0%	151	100.0%

Table D-2

Student Thoughts Regarding Better Ways to Learn Activities Taught by Elementary and Middle School Teachers

	Elementary		Middle School	
	n	%	n	%
Provide More Practice	4	2.9%	1	.5%
Change Procedures/Routines	3	2.1%	25	13.5%
Change Organization of Drills or Activities	17	12.1%	27	14.6%
Provide More Feedback	1	.7%	5	2.7%
Exercise With Students	1	.7%	5	2.7%
Change Warm-Up Exercises	23	16.4%	21	11.4%
Provide Better Explanation or Demonstration/Clarity	7	5.0%	11	5.9%
Provide Outside of Class Experiences	6	4.3%	3	1.6%
Have Better Class Control	3	2.1%	18	9.7%
No Change in Lesson	67	47.9%	63	34.0%
No Reply	3	2.1%	4	2.2%
Other	5	3.7%	2	1.2%
TOTAL	140	100.0%	185	100.0%

Table D-3

Interrater Reliability for Student Cognition Interviews

Lesson	1	2	3
Affective			
Neg. Eval of Self	.75	.80	1.00
Motivating Self	.86	.83	.80
Neg. Feel. Sit.	1.00	1.00	.86
Pos. Feel. Sit.	1.00	1.00	1.00
Wanting to Get Done	----	---	1.00
Self/Team Assess.	1.00	1.00	1.00
Winning	1.00	1.00	1.00
Comprehension			
Conf.- Skill	.86	.86	1.00
Conf.- Proc.	.80	1.00	.83
Conf.- Cog. Conc.	1.00	1.00	----
Attending	1.00	1.00	1.00
Remembering	----	1.00	1.00
G. Cog. Concept	.80	.83	1.00
S. Cog. Concept	1.00	----	1.00
Skill-Related			
Gen. Skill Tech.	1.00	1.00	1.00
Spec. Skill Tech.	1.00	----	1.00
Player Positions	----	1.00	----
Social Thoughts	----	1.00	----
Off-Task Thoughts	1.00	1.00	1.00
No Reply	1.00	1.00	1.00
**********			
Student Thoughts-Ways Teachers Help			
Demonstration	1.00	1.00	1.00
Explanation	1.00	1.00	1.00
Review	.86	1.00	1.00

Table D-3 cont'd.

Lesson	1	2	3
Student Thoughts-Teachers Help cont'd.			
Individual Feedback	1.00	1.00	1.00
Task Analysis	1.00	----	.83
Provided Handouts/AV	----	----	1.00
Participated With Us	----	1.00	----
No Reply	1.00	1.00	1.00
Other	----	----	1.00
Student Thoughts-Better Ways to Instruct			
Change Routines	----	1.00	----
Change Organ.	1.00	1.00	.86
Provide More Feedback	----	1.00	1.00
Exercise with Student	1.00	----	----
Change Warm-Ups	.80	.86	.80
Clarify Explan/Demo.	----	1.00	----
Prov. Out.of Class	1.00	----	----
Better Class Con.	----	1.00	----
No Change in Lesson	1.00	1.00	1.00
No Reply	1.00	1.00	1.00
Other	1.00	1.00	----

Table D-4

Intrarater Reliability for Student Cognition Interviews

Lesson	1	2	3
Affective			
Neg. Eval. of Self	1.00	1.00	1.00
Mot. Self	1.00	1.00	1.00
Neg. Feel. Sit.	1.00	1.00	1.00
Pos. Feel. Sit.	1.00	1.00	1.00
Wanting to Get Done	----	----	1.00
Self/Team Assess.	1.00	1.00	1.00
Winning	1.00	1.00	1.00
Comprehension			
Conf.-Skill	.86	1.00	1.00
Conf.-Proc.	1.00	1.00	.86
Conf.-Cog. Conc.	1.00	1.00	----
Attending	1.00	1.00	1.00
Remembering	----	1.00	1.00
Gen. Cog. Con.	.86	1.00	1.00
Spec. Cog. Con.	1.00	----	1.00
Skill-Related Thoughts			
Gen. Skill	.86	1.00	1.00
Spec. Skill	1.00	----	1.00
Player Positions	----	1.00	----
Social Thoughts	----	1.00	----
Off-Task Thoughts	1.00	1.00	1.00
No Reply	1.00	1.00	1.00
**********			
Student Thoughts-Ways Teachers Help			
Demonstration	1.00	1.00	1.00
Explanation	1.00	1.00	1.00
Review	1.00	1.00	1.00

able D-4 cont'd.

Lesson	1	2	3
Student Thoughts-Ways Teachers Help cont'd.			
Individual Feed.	1.00	1.00	1.00
Task Analysis	1.00	----	1.00
Prov. Handout	----	----	1.00
Part. With Us	----	1.00	----
No Reply	1.00	1.00	1.00
Other	----	----	1.00
Student Thoughts-Better Way to Instruct			
Change Routines	----	1.00	----
Change Org.	1.00	1.00	1.00
Provide Feedback	----	1.00	1.00
Ex. with Student	1.00	----	----
Change Warm-Ups	.83	1.00	.86
Clarify Exp./Demo.	----	1.00	----
Better Class Cont.	----	1.00	----
Prov. Out of Class	1.00	----	----
No Change	1.00	1.00	1.00
No Reply	1.00	1.00	1.00
Other	1.00	1.00	---

APPENDIX E

Decision Log and Definitions for Routines and Activity Structures

DECISION LOG

ACTIVITY STRUCTURES

1. Orientation/Closing: Any time prior to the instructional phase of the class. Examples: prior to warm-up; waiting for class to begin. Any time during the final non-instructional phase of the class.

2. Presentation: Explanations by the teacher. Examples: Goals for the year; grading procedures; incentives; techniques; rules of games; skills; and warm-ups.

3. Practice: Children are working on newly acquired skills or activity or exploratory movement experiences.

4. Demonstration: The teacher or a student will model a technique for skill or activity. If the teacher models the technique at the same time he/she presents skill with a verbal explanation, code demonstration only.

5. Transition: The phase between one instructional segment and the beginning of another; switching activities or group size or formation.

6. Game Play: The phase in the class when the child is involved in an organized game activity.

7. Tests or Measurement: Any formal evaluation occurring or any type of measurement made on students. Examples: Fitness test items, height and weight.

8. Warm Up: Any type of calisthentics or vigorous activity prior to the skill development and/or game play segment of the class.

ROUTINES

INTERACTIVE ROUTINES

1. Choral Response: Any question asked without a specific student's name called should be coded as choral response. If several students, rather than the whole class, answer in unity, code as choral response.

2. Individual/Call Until Correct: If a question is asked and teacher calls on individual student; code as individual exchange/call until correct category. Students may raise their hands to answer, if so, code both hand raising and call until correct. See hand raising for further clarification.

3. Paying Attention: Any time when there are any teacher statements to redirect students' focus. Examples: "Eyes on me"; "Listen Up"; "I'm waiting", or "Pay Attention".

4. Hand Raising: Code if hand raising is modeled by teacher while asking a question or when the teacher specifically requests for students to raise their hands. Code only one time for each question answered. For example, if a teacher asks a question and 12 students raise their hands to respond, only code one time rather than 12 times. Similarly, if the teacher is calling roll and requests hand raising, code only once. If teacher is questioning in a "call until correct" format, and children are raising hands, code hand raising for each question asked, rather than for each child who raises their hand.

MANAGEMENT ROUTINES

1. Line Up: code if teacher specifies or explains how to line up to enter or exit the play area or if the teacher reinforces line-up routines with such statements as "I like the way you are in line"; "Where should you be?" (referring to the line).

2. Signal for Stop: code if the teacher explains or implements a procedure for stopping activity such as a whistle signal and/or anytime the teacher uses a verbal command such as "Freeze".

3. Water/Restroom: code if there is a statement by teacher regarding water or restroom procedure.

4. Move Quickly and/or Quietly: code for any verbal statement or specific gesture from teacher indicating need for efficiency and order in the class. Examples: "Move Quietly", or teacher begins counting to five; 1, 2, ... ; use of a "silent yell" to show excitement during indoor play.

SUPPORT ROUTINES

1. Formation/Spacing: code when any comment or gesture is made to enforce spacing/ formation of students for the activity. This may be for either getting into a formation or for maintaining the formation. Spacing may be also coded when the teacher assigns children to a task in groups to reduce confusion and/or misbehavior ("crowding up"). Examples: "Scoot Around", "Look how crowded the girls are--spread out", "Take one step back".

2. Equipment: code if there is a teacher-directed statement about the use of equipment and/or if there is a specific procedure demonstrated for distribution of equipment. Examples: "Don't touch the beanbag until I give you directions", "Leaders for group one, please pass out the beanbags".

3. Appropriate Dress: code when the teacher specifies appropriate attire for physical activity.

APPENDIX F
Teacher Questionnaires

QUESTIONNAIRE
EXPERT TEACHER

Name _____

School _____

Age _____

Grade Level(s) (that you teach) _____

Number of Years Teaching at Present School _____

Number of Total Years Teaching _____

University(ies) Attended _____

Degree(s) Earned _____

Please give approximate data for:
School Population _____

Racial Distribution _____

Predominant Socioeconomic Status of the Students (Low, Middle, Upper Class) _____

On a separate piece of paper, please answer the following open-ended questions as explicitly as possible:

1. What are the factors that you feel contribute to the success of your p.e. program?

2. What are the reasons you stay in the field of teaching in general and in physical education in particular?

3. What professional goals do you hope to achieve throughout the remainder of your teaching career?

4. What professional achievement is the most significant thus far in your teaching career?

5. What do you consider to be the most important goal or objective of your p.e. program?

6. What other objectives do you consider important? (List in order of importance)

7. What specific goals do you try to accomplish during the first few days of the school year?

8. If you could change anything regarding your p.e. program, what would that be?

9. Please list any sports that you participated in high school and/or college, or that you are presently associated with.

Student Teacher Questionnaire

Name _____ Age _____

School (where you are student teaching) _____

Grade Level(s) that you teach _____

Please answer the following questions in full detail:

1. Why did you decide to enter the field of teaching in general and physical education in particular?
2. What professional goals do you hope to achieve throughout your teaching career?
3. Please describe your student teaching experience with regard to:
   a. your best experiences (successes)
   b. your most challenging experiences
   c. your most frustrating experiences
   d. your relationships with your students/classes
   e. your relationship with your supervising teacher and co-workers at your school.
4. Please describe your outside responsibilities with regard to work, social, and/or family obligations.
5. What recommendations would you make to improve the quality of the teacher training program at the School of Health, Physical Education, Recreation, and Dance at LSU?
6. Have you changed your outlook toward your chosen profession as a result of your student teaching experience? If so, how?
7. What do you feel was your strongest characteristic in working with and teaching your students? your weakest characteristic?
8. What characteristics of your supervising teacher will you try to use in your future teaching career and why?
9. What characteristics of your supervising teacher would you not use in your future teaching career and why?

APPENDIX G

Permisssion Forms

PARENTAL PERMISSION LETTER FOR SLIDE PRESENTATION PARTICIPATION

February 23, 1988

Dear Parents,

Your child has been asked to participate in a research project for the School of Health, Physical Education, Recreation and Dance at Louisiana State University. A slide presentation will be made of your child's gymnastic class. We are asking that you allow your child to participate. Please sign this form and return it by Friday, February 26th. Thank you for your cooperation and please do not hesistate to call if you have any questions. My number at work is 388-2387 and at home 769-1835.

Karyn Nelson
Research Assistant
LSU

_____ has my permission to participate in a slide presentation for a research project for LSU.

Signed

_____

Parent's name

_____ does not have permission to participate in a slide presentation for a research project for LSU.

Signed

_____

Parent's name

March 1, 1988

Dear Parent,

Your child's physical education class has been selected to participate in a research project for Louisiana State University. The physical education class will be videotaped and several students will be randomly selected to be interviewed following the taping. They will be asked to describe their thoughts during the class activity.

We are asking that you give permission to have your child videotaped and interviewed. The name of your child will never be used in this project. I will be happy to answer any questions that you might have regarding this project. My phone at work is: 388-2387 or at home: 769-1835. The purpose of the research is to learn how children are thinking during instruction.

Thank you for your cooperation.

Sincerely,

Karyn R. Nelson
Research Assistant
School of HPERD
Louisiana State University

Amelia M. Lee
Professor
School of HPERD
Louisiana State University

Please return this permission slip to your child's physical education teacher. Thank You.

My child _____ has my permission to be videotaped and interviewed during physical education class.

_____

Parent's signature

My child _____ does not have my permission to be videotaped and interviewed during physical education class.

_____

Parent's signature

Informed Consent for Expert/Novice Experiment

***To be retained by the investigator**

My signature, on this sheet, by which I volunteer to participate in the experiment on differences in expert and novice physical education teachers conducted by Karyn Nelson indicates that I understand that all subjects in the project are volunteers. I can withdraw at any time from the experiment, and I have been informed as to the nature of the experiment. The data will be anonymous and my identity will not be revealed without my permission, and my performance in this experiment may be used for additional approved projects. Finally, I shall be given an opportunity to ask questions prior to the start of the experiment and after my participation is complete.

_____

Subject's Signature

VITA

Karyn Rayhill Nelson was born November 7, 1954, in Hammond, Indiana. She graduated from Verbena High School, Verbena, Alabama in May, 1972. She earned the Bachelor of Science degree from Auburn University at Montgomery, Montgomery, Alabama, in 1978, with a major in Health, Physical Education, and Recreation.

The author has taught physical education at the elementary, middle school and secondary school levels in Montgomery, Alabama and Baton Rouge, Louisiana. In addition, the author served for 3 years as an instructor at Southern University in Baton Rouge.

In 1983, the author earned the Master of Science degree with a major in physical education in the School of Health, Physical Education, Recreation and Dance from Louisiana State University. She entered the doctoral program at Louisiana State University in 1984. She became a full time doctoral student and served as a Graduate Teaching Assistant in 1986-87 and as a Research Assistant to the Editor-in-Chief of the Research Quarterly for Exercise and Sport in 1987-88. The author accepted a position as Assistant Professor in the Division of Health, Physical Education, Recreation and Dance at the University of Idaho for the 1988-89 academic year.

The Doctor of Philosophy degree in physical education with a specialization in pedagogy was awarded from Louisiana State University in August, 1988.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate Karen E. Nelson

Major Field Physical Education (Pedagogy)

Title of Dissertation Thinking Processes, Management Routines and Student Perceptions of Expert and Novice Physical Education Teachers

Approved

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE

Date of Examination

July 19, 1983