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The Associations of Student Achievement and Classroom Practices Among Third-Grade  
Teachers in Upper East Tennessee

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A dissertation  
presented to  
the faculty of the Department of Educational Leadership and Policy Analysis  
East Tennessee State University

In partial fulfillment  
of the requirements for the degree  
Doctor of Education

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by  
Tausha L. Clay  
December 2005

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Dr. Louise MacKay, Chair  
Dr. Terry Tollefson  
Dr. Jasmine Renner  
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Keywords: Early Childhood Education, Student Learning, Classroom Practices,  
Tennessee Comprehensive Assessment Program

## ABSTRACT

### The Associations of Student Achievement and Classroom Practices Among Third-grade Teachers in Upper East Tennessee

by

Tausha L. Clay

The purpose of this study was to determine if an association existed between student achievement scores and classroom practices used among third-grade teachers in Upper East Tennessee. The variables included classroom environment, instructional context, and social context, employing developmentally appropriate practices (DAP). Teacher characteristics, including type of degree, highest degree, years of experience, level of DAP knowledge, and degree granting institution, were analyzed for characteristics influencing developmentally appropriate practices. The instrument, Assessment of Practices in Early Elementary Classrooms (APEEC), was used to gather information; the *Tennessee Comprehensive Assessment Program (TCAP/CRT)* Reading/Language and Mathematics scores were used to determine students' achievement level. A demographic survey was used to collect teacher characteristic information.

An initial analysis of data incorporated simple descriptive statistics in the form of frequency tables. Independent samples *t* tests, analyses of variance (ANOVAs), and Pearson Product moment correlation coefficients were used to determine if there were associations in DAP levels among teacher characteristics. Finally, one-way-analysis of variance assessed the associations between the dependent variables (*TCAP/CRT* scores) and independent variables (environment, instruction, and social context).

The analysis of the data indicated that the majority of the third-grade teachers were certified in elementary education. Over half of the sample had master's degrees or above. Six had not taught any grades except third. The third-grade teachers had less experience in teaching kindergarten and more experience in first and second grades. An independent-samples *t* test indicated no significant differences in APEEC scores between teachers with early childhood degrees and teachers with other degrees; no significant differences in APEEC scores between teachers with a bachelor's degree and teachers with a master's or higher degree; and no significant differences between degree granting institutions. Correlation coefficients indicated APEEC scores were not significantly affected by teachers' years of experience. ANOVAs indicated significant differences in APEEC physical environment and social environment scores among teachers having a great deal of DAP knowledge but not in classroom instruction. ANOVAs indicated significant differences in classroom instruction and student achievement scores in Reading/Language, but not in Math. No significant differences were found in APEEC social and physical context scores.

## DEDICATION

This work is dedicated to the three that are most dear to me...

my husband, Brian

my son, Christian

and my mother, Chris.

I thank them for their unconditional love, support, and encouragement.

This work is devoted to all the enthusiastic

teachers

who strive to make a difference in the lives of children.

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## CHAPTER 1

### INTRODUCTION

Research confirms that teachers are the single most important factor in raising student achievement. Students arrive in the classroom with many different backgrounds and experiences, each bringing its own set of opportunities and challenges. Highly qualified teachers can maximize every child's potential to meet high academic standards. Teachers are key to fulfilling the promise of No Child Left Behind. – Rod Paige

(U.S. Department of Education, 2004)

Over 20 years ago, the United States was known as the “Nation At Risk.” The 1983 report revealed that students’ test scores were falling, schools were demanding too little from students, and United States school standards were not comparing well to other countries (Coeyman, 2003). By 1989, former-President George H. W. Bush organized a governors’ conference on education that directly aimed to improve public schools (Fullan, 1993). Even though the first Bush administration’s response had been to build on an accountability system for schools tied to a set of national standards, research indicated that student achievement continued to remain stagnate. Former President Clinton initiated Goals 2000, which did not make the needed sufficient change. Thus, this sequence of events set the impetus for the No Child Left Behind (NCLB) Act.

On January 8, 2002, President George W. Bush signed the No Child Left Behind Act to institute groundbreaking educational reform based on the following ideals: (a) stronger accountability for results, (b) more freedom for states to communicate, (c) encouragement for proven educational methods, (d) and more choices for parents (U. S. Department of Education, 2004). Coeyman (2003) asserted that education should be regarded as a vital and national concern.

### *Statement of the Problem*

By 2003, most facets of education were focused on effectively developing the skills needed to attain universal proficiency (Lewis, 2003). One of the most significant goals of NCLB was to close the achievement gap between racial and ethnic groups, between high and low socioeconomic groups, between able-bodied and challenged individuals, and between English language learners and fluent English speakers (Tyler, 2003). In order to achieve these goals, the legislation required states to test all students every year from grades three through eight. Furthermore, disaggregation of Tennessee Comprehensive Assessment Program (*TCAP*) scores was required as a goal to ensure that no group was left behind.

The overriding issue among teachers appeared to be that if their students failed to make Adequate Yearly Progress (AYP) toward statewide proficiency goals for two consecutive years, the teachers would be subject to corrective action. Schools that did not meet statewide or national standards could be closed or parents would be given an opportunity to send their children to other schools (U.S. Department of Education, 2004). The pressure on teachers, administrators, and school systems was overwhelming.

As national and local society demands and expectations for student achievement increased, it had concurrently to raise standards for teachers (National Council for Accreditation of Teacher Education, 2004). Tyler (2003) asserted, “Instructional emphasis has shifted to preparing students for high-test performance, perhaps at the expense of educating the whole child” (p. 27). Elkind (2004) made the point that, “Children are not containers to be filled up to a certain amount at each grade level”

(p.311), and argued that testing pushed students to do well on the examinations without regard to their true knowledge and understanding.

The nationwide emphasis on teacher accountability and assurance that all students and schools met high standards increased the demand for evidence of “what works” in education (What Works Clearinghouse, 2002). Teachers were forced to seek out the most effective evidence-based strategies in order to improve student achievement. Compounding this problem was the challenge for teachers to step out of their comfort zone and try new instructional methods. Smith (1991) suggested that some teachers might adopt developmentally inappropriate practices in their classrooms because of the fear of failure. Furthermore, Smith found that many primary grade teachers actually reduced the amount of time spent on meaningful, hands-on learning activities in order to prepare students for taking tests. Marzano, Pickering, and Pollock (2001) discussed that in order to meet standards and provide effective learning for students, teachers sought knowledge about: What works in education? How do we know? How can we find out? How can educational research find its way into the classroom? How can we apply it to help our individual students? Finally, was abandoning developmentally appropriate practices (DAP) a good or bad idea? No one person had the answers to these questions. There was no magic remedy, no quick fix, and no one-way answer to solving these problems.

To complicate the issue further, the Coleman *et al.* (1966) analysis of schools concluded that the quality of schooling a student received accounted for only about 10% of the variance in student achievement. Jencks *et al.* (1972) supported Coleman’s hypothesis, concluding that forces outside of schools caused variations in student

performance. Thus, the question became what influenced the other 90%? Schools could not change some of the outside forces, including the student's natural ability, socioeconomic status, or home environment (Marzano *et al.*, 2001).

In spite of this, the current educational literature was replete with debates on the Coleman and Jencks studies (Gentilucci, 2004; Goodlad, 2004). Marzano *et al.* (2001) pointed out that the current literature showed that “an individual teacher can have a powerful effect on students, even if the school doesn't” (p. 2). Furthermore, Senge, Kleiner, Roberts, Ross, and Smith (1994) discussed the answers emerging from the collective experience of learning communities, where groups worked to increase learning in a wide variety of settings. Senge envisioned thousands of educators evolving into a worldwide community with enormously powerful potential to improve education.

In light of the NCLB demands upon teachers and the accountability they must face, a study of teacher practices used in the classroom and its relationship to student achievement was relevant. The importance of “highly qualified” or exemplary and effective teachers cannot be overlooked or underrated. Marzano *et al.* (2001) acknowledged, “More can be done to improve education by improving the effectiveness of teachers than any other single factor because effective teachers appear to be effective with students of all achievement levels, regardless of the level of heterogeneity in their classrooms” (p.3). Charlesworth, Hart, Burts, and DeWolf (1993) maintained, “We all seem to agree that a traditional mechanistic factory approach to education that has dominated elementary and secondary education is not working, is not developmentally appropriate, culturally appropriate, gender appropriate, nor theoretically appropriate” (p.

16). It might be that developmentally appropriate practices could act as stepping-stones to the elimination of the achievement gap in schools and classrooms.

The purpose of this study was to determine if associations existed between student achievement scores and classroom practices used among third-grade teachers in East Tennessee. For the purpose of this study, teacher practices included the developmental appropriateness of the classroom physical environment, instructional context, and social context. Teacher characteristics, including teacher certification, type of degree, highest degree earned, years of experience, and degree granting institution, were identified. Tennessee Comprehensive Assessment Program Criterion Referenced Test (TCAP/CRT) scores were collected for each teacher's class and used to measure student achievement. Data collection related to developmentally appropriate practices were gathered through classroom observations and teacher interviews. The research presented in this study was not intended as a quick fix to solving school problems, nor did it promise to improve test scores dramatically. However, it could provide sound research for instructional leaders and early childhood teachers interested in examining the use of developmentally appropriate practices as one avenue for increasing student achievement.

### *Research Questions*

Through quantitative analysis, 30 teachers at 11 Upper East Tennessee schools provided insight into their classroom environments, instruction, and social contexts, as well as sharing their demographic profiles. Hence, the following research questions were selected as the focal point of the investigation:

1. What is the demographic profile of the third-grade teachers?

2. Are there any differences in DAP levels as measured by the Assessment of Practices in Early Elementary Classrooms (APEEC) among teacher characteristics, such as teacher certification, college major, highest degree earned, years of experience, knowledge of DAP, and degree granting institution?
3. Is there an association between third-grade teachers' use of DAP as measured by the APEEC and students' achievement on standardized tests in Reading/Language and Mathematics as measured by the TCAP/CRT?

### *Significance of the Study*

Because teacher practices are critical to student success, educators need to identify the practices that ensure high academic student achievement. This study contributes to current research by focusing on the developmentally appropriateness of teacher practices in regard to the physical environment, the instructional context, and the social context, while attempting to determine factors that strongly correlate with successful teaching and learning. The aim of this study was to identify and highlight real examples of teachers who are proponents of developmentally appropriate practices and, in addition, are still obtaining impressive achievement test results from their students. For that reason, analysis of the data from this research could have significance for school leaders concerning teacher classroom practices. This study could also provide support that early childhood teachers need to continue enhancing and improving classroom practices.

### *Limitations*

This study was limited to 30 third-grade teachers in Upper East Tennessee. The community of children in each classroom was unique, with varying demographic backgrounds. Individual socioeconomic status (SES) of students was federally protected, which limited sample choice based on school SES similarities. This study used only one year's achievement CRT data to determine the relationship. The validity of responses was subject to a one day observation of individual teaching practices as well as the self reports of the teachers. Because a cluster sample of classrooms was selected, no generalizations should be made to other populations or samples.

### *Definition of Terms*

The following terms are defined for the purposes of this particular research study.

*Criterion-Referenced Tests (CRT).* Criterion-referenced test items measure students' performance according to specific standards, rather than in comparison with the performance of other test-takers (TN Department of Education, 2004).

*CRT/TCAP Summary Report.* The (CRT) Summary Report reveals the percentage of students at or above "Proficient" and "Advanced" category (TN Department of Education, 2004).

*Developmentally Appropriate Practice (DAP).* Adopted by the National Association for the Education of Young Children (NAEYC) Governing Board, the position statement defines developmentally appropriate practice as the outcome of a process of teacher decision making that draws on at least three critical, interrelated bodies of knowledge: (a) what teachers know about how children develop and learn; (b) what

teachers know about the individual children in their group; and (c) knowledge of the social and cultural context in which those children live and learn (Bredekamp, 1997).

*Early Childhood.* Children from birth through age eight (Bredekamp).

*Exemplary Teacher.* The definition in the NCLB legislation is as follows:

A teacher who: (a) is a highly qualified teacher such as a master teacher; (b) has been teaching for at least five years in a public or private school or institution of higher education; (c) is recommended to be an exemplary teacher by administrators and other teachers who are knowledgeable about the individual's performance; (d) is currently teaching and based in a public school; and assists other teachers in improving instructional strategies, improves the skills of other teachers, performs teacher mentoring, develops curricula, and offers other professional development. (U.S. Department of Education, 2001)

*Instructional Context.* The Assessment of Practices in Early Elementary Classrooms (*APEEC*) was designed to measure the following instructional context practices: (a) use of materials, (b) use of computers, (c) monitoring child progress, (d) teacher-child language, (e) instructional methods, and (f) integration and breadth of subjects (Hemmeter, Maxwell, Ault, & Schuster, 2001).

*No Child Left Behind (NCLB).* The No Child Left Behind Act of 2001 is a landmark in education reform designed to improve student achievement and change the culture of America's schools (U.S. Department of Education, 2004).

*Physical Environment.* The *APEEC* was designed to measure the following physical environment practices: (a) room arrangement, (b) display of child products, (c) classroom accessibility, and (d) health and classroom safety (Hemmeter *et al.*, 2001).

*Primary Grades.* Children from 6 through 8 years of age usually enrolled in first through third-grades (Bredekamp, 1997).

*Scientific Based Research.* The definition in the NCLB legislation is as follows:

Research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs; and includes research that (a) employs systematic, empirical methods that draw on observation or experiment; (b) involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn; (c) relies on measurements or observational methods that provide reliable and valid data across evaluators and observers, across multiple measurements and observations, and across studies by the same or different investigators; (d) is evaluated using experimental or quasi-experimental designs in which individuals, entities, programs, or activities are assigned to different conditions and with appropriate controls to evaluate the effects of the condition of interest, with a preference for random assignment experiments, or other designs to the extent that those designs contain within-condition or across-condition controls; (e) ensures that experimental studies are presented in sufficient detail and clarity to allow for replication or, at a minimum, offer the opportunity to build systematically on their finding; and (f) has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective and scientific review (U.S. Department of Education, 2001).

*Social Context.* The *APEEC* was designed to measure the following social context practices: (a) children's roles in decision making, (b) social skills, (c) diversity, (d) appropriate transitions, and (e) family involvement (Hemmeter *et al.*, 2001).

*Tennessee Comprehensive Assessment Program (TCAP).* Students in Grades 3-8 take the *TCAP* Achievement Test each spring. The achievement test is a timed, multiple-choice assessment that measures skills in Reading, Language Arts, Mathematics, Science and Social Studies (TN Department of Education, 2004).

*What Works Clearinghouse (WWC).* The *WWC* is administered by the U.S. Department of Education's Institute of Education Sciences, which conducts educational research and rigorous reviews of scientific evidence (*What Works Clearinghouse*, 2004).

### *Overview of the Study*

This quantitative study was organized as follows: Chapter 1 included an introduction, statement of the problem, research questions, significance of the study, limitations, definitions, and overview of the study. In Chapter 2, a review of the literature is presented that includes (a) theoretical foundations of DAP, (b) overview of developmentally appropriate practice, and (c) research studies on DAP. Chapter 3 contains a description of the methodology employed in the study and enumerates the exact steps undertaken to address the research questions. Chapter 4 presents the findings of the study. Chapter 5 moves beyond the data and contains an extended discussion of the results, conclusions, and recommendations for practice and future consideration.

## CHAPTER 2

### REVIEW OF THE LITERATURE

To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and makes real advances. – Albert Einstein

(Schipul, 2005)

#### *Rationale*

The purpose of this study was to determine if a relationship existed between teacher practices and student achievement. This study was undertaken to determine if the use of developmentally appropriate practices among third-grade teachers could lead their students to increased achievement success with respect to the CRT/TCAP scores.

Quantitative analyses, interviews, and observations were methods used to explore the relationship between developmentally appropriate practices and test scores in third-grade classrooms.

This study focused mainly on teachers who were using developmentally appropriate practices in third-grade classrooms. The choice of third-grade classrooms was deliberate because research has shown a decline in developmentally appropriate practice as grade levels increase (Buchanan, Burts, Bidner, & Charlesworth, 1998; Vartulli, 1999). As a result, most measures of and research on the concept of developmentally appropriate practice focused on children from birth through kindergarten. Much less work has been done to understand developmentally appropriate practice in the primary grades (Maxwell, McWilliam, Hemmeter, Ault, & Schuster, 2001). This review of literature not only addressed theoretical influences and research

studies on developmentally appropriate practices, but it also revealed the dimensions of a developmentally appropriate classroom in regard to teacher characteristics, the classroom environment, the instructional perspective, and the social context. There was a vast amount of research on developmentally appropriate practices. Therefore, this literature review highlighted the most significant studies of early classroom experiences up to the third-grade. Most notably, the review of research presented a strong case that developmentally appropriate practice was effective for all children, regardless of socioeconomic background, culture, race, gender, age, or special needs.

### *Theoretical Influences*

#### *Constructivist Foundations*

At the end of the 20<sup>th</sup> century, educational reform had undergone a “paradigm shift – a fundamental change in a scientific community’s way of thinking” (DeVries, & Kohlberg, 1987, p. xi), regarding views of the child and the nature of mental development. Educational research indicated that children learn by actively constructing their own knowledge, rather than through passive absorption of information (Abbott, & Ryan, 1999; Bredekamp, & Copple, 1997; DeVries, Zan, Hildebrandt, Edmiaston, & Sales, 2002; Thompson, & Thompson, 2003; Stipek, 1993). This point of view on early childhood education was informed by constructivism, derived from the philosophy of Jean-Jacques Rousseau (Elkind, 2004; Null, 2004). According to Elkind (2004), Null (2004), and Pulliam (1991), Rousseau’s *Emile* proposed several ideas:

1. Children need to be allowed to develop almost entirely from their natural instincts.

2. All learning should derive from an environment in which students construct their own knowledge.
3. Children have their own ways of knowing and these should be valued and respected.
4. Children learn directly from experience.

Null (2004) further discussed how the 18<sup>th</sup> century Swiss educator, Johann Heinrich Pestalozzi contributed to constructivism with his famous “object-teaching” methods in which lessons were taught through the use of objects or other concrete devices that encouraged students to focus on the lesson at hand. According to Null, Pestalozzi’s object teaching was established on several principles:

1. All people, including the poor, can and should learn.
2. Learning begins at birth and, therefore, requires parental attention.
3. Instruction should involve dialogue between teacher and learner.
4. Drawing, music, and physical activity are essential parts of learning.
5. Teachers can improve by discovering how to structure their presentation properly and finding out how children learn.

Constructivism’s roots can also be traced back to John Dewey, known as the father of progressive education (Devries, & Kohlberg, 1987). Like Rousseau and Pestalozzi, Dewey emphasized the concept of continuous reconstruction of experience as the basis for solving problems. According to Pulliam (1991), Dewey held that “the human mind is an instrument which must be sharpened by experience for use in problem solving and adjustment to the practical situations of human life” (p. 172). Dewey supported child-centered schools with a social and moral component, as well as

integrated subjects in the curriculum (Dewey, 1972). Dewey's child-centered schools were primarily concerned with developing the whole child and representing real life experiences in order for genuine learning to occur. According to Dewey and the progressive educators, the importance of following the child's natural needs, interests, and abilities were emphasized. The active side preceded the passive in child development and neglect of active learning was considered a "waste of time and strength in school work" (Dewey, p. 91).

Additional contribution to the constructivist orientation stemmed from the work of George Herbert Mead and James Mark Baldwin (DeVries, & Kohlberg, 1987). Elkind (2004) credits Vygotsky (1962) with adding the importance of the social context to constructivist epistemology. According to Elkind, the Swiss psychologist, Jean Piaget (1954) most notably, "shaped the contemporary version of constructivism by demonstrating that the categories of knowing, no less than the contents of knowledge, are constructed in the course of development" (p. 306).

The epistemological and psychological theories of Jean Piaget were considered the most advanced scientific suppositions of mental development (DeVries, & Kohlberg, 1987). Building on Rousseau and Pestalozzi, Piaget fundamentally altered views of the child and the nature of mental development (DeVries, & Kohlberg; Pulliam, 1991). Piaget's (1954) central theme was the view of the child as active in constructing not only knowledge but also intelligence; information was not meant to be simply poured into children's minds from the environment. Piaget proposed that people went through four stages in understanding the world. Each stage was age-related and consisted of distinctive ways of thinking. Santrock (1998) pointed out, "It is the different way of

understanding the world that makes one stage more advanced than another; knowing more information does not make a child's thinking more advanced in the Piagetian view" (p. 41).

Piaget's four stages of cognitive development were: (a) sensorimotor, (b) preoperational, (c) concrete operational, and (d) formal operational (Piaget, 1954). According to Piaget, in the sensorimotor stage (birth to 2 years), an infant constructed an understanding of the world by synchronizing sensory experiences with physical actions. In the preoperational stage (2 to 7 years), the child began to represent the world with words, images, and drawings. The key element in the concrete operational stage (seven to 11) was that the child could reason logically about concrete events; whereas, in the formal operational stage (11 to 15), the adolescent reasoned in more abstract and logical ways (Santrock, 1998, chap. 2). Piaget and his followers urged educators to be realistic about what children could accomplish at each stage. Furthermore, Pulliam (1991) affirmed that it was common to revert back to earlier stages under stress. Therefore, teachers had to avoid abstract and theoretical tasks if the learners were still operating in a non-formal way.

Nejad (1995) identified Piaget's theory as constructivist because it entailed the process of building, creating, or making mental structures, instead of simply absorbing or reproducing products. Nejad further explained, "In Piagetian theory, knowledge does not exist as a separate product ready to be unloaded in the classroom and consumed by the student. Knowledge is representative of existing reality for each individual" (p.19). Therefore, all knowledge was self-created. Like Dewey, Piaget alleged that intellectual growth resulted from attempts of the child to solve problems, which caused the child

continually to reconstruct the external world through personal experience as internal representations (Nejad).

### *Contemporary Constructivist Practices*

DeVries and Zan (1995) defined constructivist education as a “developmentally appropriate approach to early education, inspired by Piaget’s theory that the child constructs knowledge, intelligence, personality, and social and moral values” (p. 5). Nejad (1995) distinguished constructivism as a new kind of idea where the emphasis would be more on what students did rather than what teachers did. Abbot and Ryan (1999) proclaimed that, in a constructivist approach to learning, nature and nurture did not compete; instead, they worked together. Elkind (2004) asserted, “The constructivist movement is generated by genuine pedagogical concerns and motivations” (p.307). DeVries *et al.* (2002) reflected the constructivist view that “learning is the result of efforts to make sense of the world” (p.2). While educational literature was beset with a range of definitions and an understanding of constructivism, the common emphasis continued to be that “each individual structures his or her own knowledge of the world into a unique pattern, connecting each new fact, experience, or understanding in a subjective way that binds the individual into rational and meaningful relationships to the wider world” (Abbot, & Ryan, p. 67). Not only did constructivism sort out the criticisms of educational practices, but it also delivered higher levels of literacy, multiple forms of literacy, self-reliance, cooperation, problem solving skills, and satisfaction with school (Nejad).

Perkins (1999) identified three distinct roles in constructivism: (a) the active learner, (b) the social learner, and (c) the creative learner. In an active learning

classroom, students were not merely listening, reading, and working through routine exercises. Instead, they discussed, debated, hypothesized, investigated, and expressed viewpoints. Constructivism emphasized that knowledge and understanding were highly social; therefore, the social learners were communicating about their construction of knowledge. In regard to the creative learner, students were valued by demonstrating more than one way to seek knowledge and answers to problems (Perkins).

Becoming a constructivist teacher did not mean giving up a commitment to the promotion of children's emotional development, but it meant integrating that commitment into cognitive and sociomoral goals (DeVries, & Kohlberg, 1987, p. 373). According to Nejad (1995), the teachers' role in a constructivist classroom was to embrace a holistic way of thinking about the nature of learning. Additionally, he pointed out that students, instead of teachers, systematized information, investigated the learning environment, conducted learning activities, and monitored their own learning. Constructivism required teachers to focus on depth of understanding and to assume a supporting or reflective role, while students constructed meaning for themselves and engaged in critical thinking and problem solving. Therefore, in constructivist classrooms, teachers would (a) use the students' own questions or ideas to guide the teacher's lesson; (b) use students' thinking, experiences, and interest to engage children in activities; (c) pose open-ended questions; (d) encourage elaboration on their questions and responses; (e) ask for explanations of events and situations; and (f) encourage students to practice self-analysis (Nejad). Brooks and Brooks (1999) supported constructivism as a means of increasing student learning with the comment:

Constructivist teachers shift their priorities from ensuring that all students learn the same concepts to ensuring that they carefully analyze students' understandings to customize their teaching approaches, which is an essential step in educational reform that results in increased learning (p.21).

In addition, Brooks and Brooks identified five central tenets of constructivism as follows:

1. Constructivist teachers value students' points of view.
2. Constructivist teachers structure lessons to challenge students' suppositions.
3. Constructivist teachers recognize that students must attach relevance to the curriculum.
4. Constructivist teachers structure lessons around big ideas, not small bits of information.
5. Constructivist teachers assess student learning in a variety of ways in the context of daily classroom investigations, not as separate events.

As early childhood teachers reflected on their classroom practices and aspired to make the paradigm shift to constructivism, they had to embrace shifts from (a) instruction to construction, (b) reinforcement to interest, (c) obedience to autonomy, and (d) coercion to cooperation (DeVries, & Kohlberg, 1987). DeVries *et al.* (2002) further discussed the teacher's role:

Teachers who have been mainly observers of children's activity must shift into a more active role. Teachers who have been accustomed to teaching by telling and by directing children's work must shift from seeing themselves as central in producing learning to seeing the child as central (p.36).

With the contemporary shift in mind, DeVries *et al.* established the following seven general principles of teaching in regard to constructivism:

1. Establish a cooperative sociomoral atmosphere
2. Appeal to children's interests

3. Teach in terms of the kind of knowledge involved
4. Choose content that challenges children
5. Promote children's reasoning
6. Provide adequate time for children's investigation and in-depth engagement
7. Link ongoing documentation and assessment with curriculum activities.

Furthermore, DeVries *et al.* proposed that the seven principles provided the constructivist interpretation of developmentally appropriate curriculum for early childhood education. Thus, the position statements of the National Association for the Education of Young Children (NAEYC) supported the constructivist view (DeVries *et al.*, 2002). As DeVries, *et al.* phrased it, "My coauthors and I identify with the position statements of NAEYC that advocate developmentally appropriate practice which reflect the constructivist view" (p.2).

#### *Behaviorist Practices*

The paradigm shift to constructivist theory contrasted sharply with the behaviorist theory. During the 1920s and 1930s, John Watson's theory of behaviorism influenced thinking about children (Santrock, 1998). The view was that "children could be shaped into whatever society wishes by examining and changing the environment" (Santrock, p. 13). The primary emphasis was that the environment influenced young children's learning (Krogh, 1997). B. F. Skinner contributed to behaviorist educational theory with approaches, such as repetition and reinforcement as means of teaching. Such didactic, teacher-directed instruction was recommended by traditional learning theorists based on Skinner's principles of repetition and reinforcement (Stipek, 1993). DeVries and Kohlberg (1987) found that repetition and drill was still practiced throughout American

education. The pedagogy of a traditional, behaviorist classroom might describe learning based on the following assumption:

Learning is believed to occur when children repeat appropriate responses to teacher-produced stimuli, and to be facilitated by breaking tasks and responses into discrete, carefully sequenced units. Errors must be corrected immediately to keep children from learning incorrect responses. Behavior is assumed to be influenced primarily by the consequences of one's own actions. Thus, teachers can enhance effort by effectively dispensing rewards and punishment. (Stipek, p. 32)

Behaviorism naturally led to the traditional view of teaching as a didactic instructional model with carefully sequenced sets of prescribed materials and goals (Krogh, 1997). According to Nejad (1995), in a traditional classroom of instruction, the words of the teacher, words in print, and other activities, including required memorization, were the major principles for imparting information to pupils. Clearly, there was not as much opportunity to create and act upon new knowledge in a behaviorist classroom. Nejad suggested:

In classroom activities where the teacher talks most of the time the learner is required to exert a great deal of attention, a difficult task; comprehend terms a teacher uses, a more difficult task; impose order on the incoming temporal stream of information, an often impossible task; and make judgments about the quality and significance of information, an unrealistic task. (p.24)

In regard to classroom management, DeVries and Zan (1994) described the behaviorist approach as placing emphasis on the teacher's management of the child's behavior. Behaviorist techniques usually included the orderly recording of specific behavioral observations that provided the basis for evaluating the child's behavior and giving feedback. Classrooms using this approach also posted lists of rewards children received for good behavior with typical categories, such as (a) praise, (b) stickers, (c) good behavior certificates, (d) special treats, (e) special activities, (f) games, and (g)

positive notes to parents (DeVries, & Zan, 1994). By using this method, teachers made children aware of their progress toward some behavior goal the teacher had set. DeVries and Zan (1994) clarified two suppositions of the behaviorist approach. The first general supposition of the behaviorist approach was that environmental factors shaped and controlled individual behavior responses. This idea reflected the view that “the child’s interests and purposes are irrelevant and leads to teacher-centered power assertion in relation to children” (p. 267). Thus, the child’s behavior was controlled through rewards and punishment, which contrasted with the constructivist assumption that such external regulations operated against the development of autonomy and against the construction of sociomoral knowledge. The second supposition was that behavior was controlled through reward and punishment (DeVries, & Zan, 1994).

Brandt (1995) proclaimed that there were over 70 studies confirming that the more one were rewarded for doing something, the less interest that person tended to have in whatever he or she was being rewarded to do. DeVries and Zan (1994) criticized the behaviorist approach because it failed to address the origins and causes of misbehavior. According to DeVries and Zan (1994), Hitz pointed out that behaviorist approaches operated against development of moral understanding by making children dependent on external regulation. Furthermore, DeVries and Zan (1994) cited Render, Padilla, and Krank’s critical review that argued that “students should not have ‘automatic respect’ for anyone’s authority over them” (p. 267), or that children did not need to assume that those with power had the right to force others to do what they want.

Another critique of the behaviorist approach was Brandt’s (1995) interview with Alfie Kohn about his book, *Punished By Rewards*. In the interview, Kohn contended that

both punishment and rewards were ineffective in motivating students to excel in their learning. According to Brandt, Kohn noted that rewards and punishments were ways of manipulating behavior, while destroying the potential for genuine learning. Brandt concluded that, in classrooms where students were allowed to make a variety of choices about learning and had tasks of worth to explore, the need for punishment or rewards decreased considerably. In this interview, Kohn advocated a developmentally appropriate, constructivist curriculum in which students were provided with an engaging curriculum and caring atmosphere so they could act on their natural desire to gain knowledge.

Conversely, it should not be disregarded that developmentally appropriate practice guidelines were not completely antithetical to some behaviorist practices. In fact, Marilou Hyson, Associate Executive Director for Professional Development with NAEYC, stated, “Carol Copple and I talked about [the] ideas and generally agree that developmentally appropriate practices have a strong constructivist focus. However, teachers from time to time may use behavioral techniques for specific purposes” (M. Hyson, personal communication, July 30, 2004).

### *Developmentally Appropriate Practice*

The most well-known association advocating DAP was the National Association for the Education of Young Children (NAEYC). NAEYC was the nation’s largest professional organization of early childhood educators (Bredekamp, 1997). Because of a growing concern about formalized, academic instruction in early childhood education, documents were developed by NAEYC in 1987 to provide guidance for early childhood

educators (Charlesworth, 1998). Another concern for the organization was to establish the NAEYC accreditation process, which required accredited programs to “exhibit developmentally appropriate activities, materials, and expectations” (Charlesworth, p. 274). Within the NAEYC document, examples of appropriate and inappropriate practices were presented for the early childhood years, ranging from infants and toddlers to children ages six through eight. By 1997, these documents were revised, offering a deeper description of DAP in the book entitled, *Developmentally Appropriate Practice Early Childhood Programs* (Bredekamp & Copple, 1997). More than half a million copies of the book were distributed and adopted by numerous state departments of education in the United States (Bredekamp).

Prior to NAEYC’s contribution to the theory underlying early childhood education, Bredekamp (1997) postulated that many childhood programs were placing excessive emphasis on rote learning and whole-group instruction of narrowly defined academic skills “at the expense of more active learning approaches” (p. v). According to Bredekamp, these practices were occurring more in kindergarten and primary grade classrooms, where it seemed that the curriculum continued to trickle down from the higher grades. Furthermore, Kostelnik, Soderman, and Whiren (1999) asserted practices, such as (a) whole-class instruction, (b) teacher-directed instruction, (c) formal reading instruction, (d) written instruction out of workbooks, and (e) frequent grading, were being “pushed down” into kindergarten classrooms. First and second graders, too, were required to achieve tasks previously required for upper grades, such as taking standardized achievement tests and dealing with possible retention.

The primary position of DAP was that programs designed for young children needed to be based on (a) what is known about young children and the development of young children, (b) what is known about the strengths, interests, and needs of the individual children in the group, and (c) knowledge of the social and cultural contexts in which children live (Bredekamp, 1997). Thus, the goal of DAP was to “open up the curriculum and move away from the narrow emphasis on isolated academic skills and the drill and practice approach to instruction that was dominating many programs for young children” (Kostelnik *et al.*, 1999, p. 17). Bredekamp clarified that developmentally appropriate practice was not a prescription that one could find in a book. Rather, it was a framework, a philosophy, or an approach to working with young children (Bredekamp, & Rosegrant, 1992). Bredekamp concluded, “Practices for young children are more likely to be appropriate if teachers employ a variety of approaches targeted to individuals’ strengths and needs rather than always expect all the children to do the same thing at the same time” (p. 39).

### *Principles of DAP*

According to Bredekamp (1997), a great deal of knowledge informed early childhood practice and could not be completely summarized in a position statement. Therefore, NAEYC offered 12 fundamental, empirically-based principles of child development and learning that constituted some of the broad-based ideas that informed decisions about practice. Principles, as defined by Bredekamp and Copple (1997), were “generalizations that are sufficiently reliable that they should be taken into account when making decisions” (p. 9). Those principles were as follows (Bredekamp & Coople, 1997):

1. Domains of children's development – physical, social, emotional, and cognitive- are closely related.
2. Development occurs in a relatively orderly sequence, with later abilities, skills, and knowledge building on those already acquired.
3. Development proceeds at varying rates from child to child as well as unevenly within different areas of each child's functioning.
4. Optimal periods exist for certain types of development and learning.
5. Development proceeds in predictable directions toward greater complexity, organization, and internalization.
6. Development and learning occur in and are influenced by multiple social and cultural contexts.
7. Children are active learners, drawing on direct physical and social experience as well as culturally transmitted knowledge to construct their own understandings of the world around them.
8. Development and learning result from interaction of biological maturation and the environment, which includes both the physical and social worlds that children live in.
9. Play is an important vehicle for children's social, emotional, and cognitive development, as well as a reflection of their development.
10. Development advances when children have opportunities to practice newly acquired skills as well as when they experience a challenge just beyond the level of their present mastery.
11. Children demonstrate different modes of knowing and learning and different ways of representing what they know.
12. Children develop and learn best in the context of a community where they are safe, valued, their physical needs are met, and they feel psychologically secure. (pp. 10-15)

### *Misconceptions of DAP*

Kostelnik *et al.* (1999) maintained that because DAP were more widely known, it could, therefore, be subjected to misinterpretation. This especially applied as people tried to relate the DAP principles to actual classroom practices. As a result, some early childhood educators employed practices they considered to be developmentally appropriate that, in fact, were not. "Others reject DAP because what they believe to be true about the philosophy is really false" (Kostelnik *et al.*, p. 39). As both Bredekamp and Rosegrant (1992) and Kostelnik *et al.* acknowledged, there were some typical myths regarding DAP.

One mistaken impression is that DAP does not require teachers to do anything more than put out a variety of manipulatives for children to use each day. A third-grade teacher erroneously believed that academic subjects are ignored in DAP classrooms. Another teacher mistakenly presumed that teacher-led interactions are always inappropriate. Such misinterpretations have led to tremendous confusion about what developmentally appropriate practices really are. (Kostelnik *et al.*, p. 39)

Furthermore, Kostelnik *et al.* (1999) and Bredekamp and Rosegrant (1992) identified additional DAP myths and misunderstandings:

1. There was one right way to implement DAP in the classroom.
2. All one needed to create developmentally appropriate programs were the right materials.
3. Developmentally appropriate classrooms were unstructured and chaotic.
4. The teacher sat up the environment and then stood back and did not do anything.
5. In developmentally appropriate classrooms, teachers were not teaching.
6. DAP required one to think about all educational practices in “either/or” terms.
7. No type of direct instruction was developmentally appropriate.
8. Academics had no place in DAP classrooms.
9. To be developmentally appropriate, elementary teachers had to water down the traditional curriculum.
10. DAP failed to support family values.
11. There was no attention to cultural diversity.
12. DAP was a totally constructivist approach.

#### *Dimensions of Primary DAP*

As described earlier, developmentally appropriate practice referred to practices that were both age and individually appropriate, as defined by the NAEYC guidelines

(Bredekamp, 1997). An important attribute of DAP was that it was not dogmatic; it was very flexible (Charlesworth *et al.*, 1993). According to Charlesworth *et al.*, “flexibility does not mean lack of structure and lack of academics; it means developmentally appropriate structure and academics based on our current knowledge of child development” (p. 14). For this reason, NAEYC guidelines were intended for teachers to tailor DAP on the basis of their students’ needs and interests. Guidelines were age specific and included developmentally appropriate practices for (a) infants and toddlers, (b) three-year olds, (c) four- and five-year olds, and (d) primary grade classrooms, serving children five to eight years of age (Goldstein, 1997). Charlesworth *et al.* contended that the interpretation of the NAEYC guidelines defined the extremes of developmentally inappropriate (DIP) and DAP and that there was a continuum from one extreme to the other. For example, several early childhood studies indicated that usually there were no classrooms where teachers used 100% appropriate or 100% inappropriate teaching practices (Burts *et al.*, 1993).

In regard to implementing DAP in the primary grades, Goldstein (1997) related “primary grade teachers are caught between a rock – the nationally recognized exemplars for high quality education for the children in their care – and a hard place – the norms, traditions and expectations of the school settings in which they work” (p. 4) because there was a distinction between early childhood education and elementary education. Goldstein further established that the bulk of the literature on DAP practices examined kindergarten or preschool practices, which excluded the needed DAP primary research. Perhaps, this was because elementary schools might be difficult places to employ developmentally appropriate practices (Goldstein).

With the concern of little primary research being conducted to understand developmentally appropriate practices in the elementary grades, Hemmeter, Maxwell, Ault, and Schuster (2001) developed the Assessment of Practices in Early Elementary Classrooms (APEEC), which examined K-3 classrooms. Following the NAEYC guidelines, including six to eight-year-olds, the instrument focused on (a) classroom environment, (b) instructional context, and (c) social context. Because the APEEC specifically concentrated on early elementary classrooms, it encouraged a new window of opportunity for research in the primary grades.

### *Classroom Environment*

Research suggested that a highly qualified or a highly trained teacher with a caring attitude was the most critical element in a quality early childhood classroom (Isbell, & Exelby, 2001). A knowledgeable and caring teacher could plan, design, and make the environment an inviting place for nurturing and facilitating the development of young children. Goldstein (1997) qualitatively studied a primary teacher and described a sign on the teacher's door that read, "Opening the classroom door should be as exciting as opening a gift package" (p. 8), which indicated the importance of the learning environment. As teachers' gained a greater understanding of child development and their children's level of development, they could, accordingly, create and design the environment that best met their students' needs (Isbell, & Exelby). Consistent with Hemmeter *et al.* (2001), an excellent room arrangement would include places in the room where children could accomplish specific tasks and activities. Many early childhood classrooms included learning centers. These carefully planned spaces allowed children to work on activities independently, with a group, or with an adult. Isbell and Exelby

contended that it was essential to change materials and activities within the learning centers on a regular basis as the children's interests and discoveries dictated. All the materials necessary to accomplish learning tasks were to be placed in that work area. A defined space could also be set aside for a child to work alone, with that space protected from intrusion by others with a physical boundary or a rule. Children could sometimes choose when to use this space. It was also vital that early childhood teachers took special health and safety precautions for all children, including children with disabilities (Hemmeter *et al.*). For example, there should be no unstable furniture in the classroom, and the room design should include safety procedures. Child products should be displayed throughout the room, and students' work should represent their individuality. Isbell and Exelby asserted that effective displays helped children understand that their work was important and valued in the classroom. Children could be involved in the development of documentation panels. That is, they could assist by sequencing photographs of learning activities and providing verbal explanations of their learning experiences (Isbell, & Exelby). In addition, student work could include two-dimensional or three-dimensional displays, which would enhance creativity. Thus, creativity and individualism were highly valued in a DAP classroom.

### *Instructional Context*

A fundamental principle of developmentally appropriate practice was that children are, indeed, active learners. Developmentally appropriate teachers realized that "better learning will come not so much from finding better ways for the teacher to instruct, but from giving the learner better ways to construct" (Hyerle, & Yeager, 1999). Therefore, in contrast to the didactic approach, children in a developmentally appropriate

classroom were not directly taught concepts. Instead, a teacher facilitated learning by (a) providing children with a wide variety of experiences, (b) encouraging children to choose and plan their own learning activities, (c) engaging children in active learning by posing problems and asking questions that stimulate and extend learning, (d) guiding children through skill acquisition activities as needed, and (e) encouraging children to reflect on their learning experiences (Marcon, 1999). According to Hemmeter *et al.* (2001), all children in a developmentally appropriate classroom should manipulate hands-on materials for a majority of the day in order to support child learning. Examples of hands-on-materials included: (a) art supplies, (b) games, (c) coins, (d) blocks, (e) unifix cubes, (f) scales, (g) counters, and (h) rulers, among others. Bredekamp and Copple (1997) pointed out, however, that teachers needed to understand that manipulating objects did not automatically improve children's understanding. Instead, it was the combination of active learning with the use of hands-on materials and skilled teaching based on a relevant, engaging, and intellectually challenging curriculum.

One way teachers could promote active learning was by implementing learning centers as a component of daily instructional activities. Sloan (2000) discussed how teachers could make the most of learning centers. Children learned by doing – they actively constructed knowledge by interacting with the world around them. Open-ended in nature, activities that challenged children, as well as exposing them to integrated concepts appropriate for their ages and abilities were supported DAP practices. Centers set the stage for meaningful hands-on exploration, experimentation, and practice (Sloan).

A second way teachers could promote active learning was through the use of cooperative grouping. Johnson and Johnson (1988) identified a common practice among

teachers as separating students from one another and having them work on their own. However, Johnson and Johnson found that the vast majority of research comparing student-student interaction patterns indicated that students learned more effectively when they worked cooperatively. After reviewing over 500 studies, Johnson and Johnson presented data suggesting that:

1. Students achieved more in cooperative interaction than in competitive or individualistic interaction.
2. Students were more positive about school, subject areas, and teachers when they were structured to work cooperatively.
3. Students were more positive about each other when they learned cooperatively than when they learned alone – regardless of differences in ability or ethnic background.
4. Students were more effective interpersonally as a result of working cooperatively than when they worked alone. Students with cooperative experiences were more able to understand the perspective of others, were more positive about taking part in controversy, had better developed interaction skills, and had a more positive expectation about working with others.

A third way teachers could promote active learning was through the use of technology. For example, computer programs and the Internet could be used for research purposes (Hemmeter *et al.*, 2001). Research conducted using computers did not necessarily have to happen in the classroom. When designing curricular activities for students, Shade and Davis (1997) indicated that computer software could serve as a

manipulative. Further, with the right kind of software, computers could serve as an open-ended and discovery-oriented way to enhance learning (Shade & Davis).

Finally, a developmentally appropriate instructional context would include the teacher using at least two teaching methods within at least two subject areas. This required teachers to reflect upon the different ways that their children learned best, such as taking the different learning styles into consideration (e.g., visual, kinesthetic, tactile, etc.). Bredekamp and Copple (1997) pointed out that teacher decision making is necessary for planning developmentally appropriate practice. The challenge for teachers who plan curriculum was ensuring that the rich content of the primary-grade curriculum was taught, while acknowledging each child's developing abilities, interests, and enthusiasm for learning. Specifically, developmentally appropriate teachers focused not only on the cognitive domain, but also on the physical, social, and emotional domains of children's development.

### *Social Context*

The social context in a developmentally appropriate classroom was a very important component and was not disregarded. In fact, the social development of young children should be taken into consideration equally as much as cognitive development (DeVries, & Zan, 1994). Teachers ascribing to developmentally appropriate practices had to have a thorough understanding of how to foster children's social competences and understand their role in doing so (Katz, & McClellan, 1997). Bronfenbrenner (1990) claimed that all children needed someone who was crazy about them. Ideally, but not always the case, children and their primary caregiver had a loving and supporting

relationship. With this in mind, teachers had to provide gentle and nurturing individualized guidance for young children (Katz, & McClellan).

Developmentally appropriate teachers allowed children to make self-choices several times a day concerning learning activities. For example, Hemmeter *et al.* (2001) specified child choice could include differentiation among activities, such as whether to draw a picture, read a book, or write a story, with the child choosing the topic. Then, after that task was completed, the child could choose another activity.

A developmentally appropriate classroom was one in which positive social interaction occurred for all students in the classroom, both among themselves and with the teacher (Hemmeter *et al.*, 2001). Teachers were respectful to all the children and served as positive role models for good character traits and self-regulated learning (Stanulis, & Manning, 2002). Teachers also encouraged children to negotiate their own solutions to problems, thus, allowing them to become active problem solvers. While doing so, teachers had to be willing to take students' perspectives about their own learning into consideration (Gentilucci, 2004).

Diversity was highly valued in a developmentally appropriate classroom and was seen across multiple areas (Hemmeter *et al.*, 2001). Diversity and multiculturalism were integrated through themes and daily activities, not segregated into separate activities. A variety of information and materials, such as books, displays, or music on diversity, should be presented in the classroom. Biased perspectives, such as (a) a teacher saying "sit Indian style," (b) placing posters in the room focused on only one religion's holiday, or (c) assigning only girls to the housekeeping center were inappropriate.

Family involvement was a crucial element in developmentally appropriate classrooms (Hemmeter *et al.*, 2001). Teachers should communicate openly with families concerning each child's overall progress at school (Katz, & McClellan, 1997). They should communicate often, using tools such as communication notebooks, e-mail, or classroom newsletters. The teachers should ask families how they want to be involved in classroom-related activities. Hemmeter *et al.* also encouraged the school or teachers to engage parents in evaluations of their child's classroom, school, or teacher at least annually, a method that enhanced excellence and communication.

### *Teacher Characteristics*

In regard to teacher characteristics, such as (a) educational level, (b) years of experience, and (c) teacher beliefs, several recent studies examined the relationship between teacher characteristics and developmentally appropriate practices (e.g., Buchanan, Burts, Bidner, White, & Charlesworth, 1998; Maxwell, McWilliam, Hemmeter *et al.*, 2001; McMullen, 1999). Prior to these studies, Isenberg (1990) indicated that teacher judgments were directly influenced by knowledge and beliefs, which, consequently, determined classroom instruction. Dunn and Kontos (1997) reported that, unfortunately, very few early childhood education classrooms exemplified developmentally appropriate practice. More specifically, only about one fifth to one third of the early childhood classrooms fully demonstrated developmentally appropriate practice. Dunn and Kontos identified in-service training as one factor for teachers to learn how to implement developmentally appropriate practices. According to Dunn and Kontos, the study by Hyson, Hirsh-Pasek, and Rescorla found moderate positive relationships between early childhood teachers' beliefs and practices. That is, the more

strongly teachers believed in developmentally appropriate practices, the more likely they were to implement those practices in their classrooms. Dunn and Kontos concluded that more studies were clearly needed in regard to developmentally appropriate practices.

In 1998, Buchanan, Burts, Bidner, White, and Charlesworth identified teacher characteristics that were related to self-reported beliefs and classroom practices of first, second, and third-grade teachers. Buchanan *et al.* focused on teachers at these grade levels because very little research had taken place in primary grade classrooms. This research study was completed “in hopes of achieving more long-term and wide-spread success in incorporating preschool and kindergarten philosophy into the primary grades than had been previously achieved” (p. 461). The study was conducted in a single, culturally diverse, southern school district in which administrators had not encouraged or advocated DAP practices. Data were gathered using *The Primary Teachers’ Beliefs and Practices Survey*. In regard to the primary teachers, the distribution of scores for developmentally inappropriate beliefs appeared to be slightly skewed in a positive direction, indicating that these teachers believed that the developmentally inappropriate items were more important than DAP practices. The study also found that teachers who perceived having more relative influence on their own practices reported engaging in fewer inappropriate activities than did teachers who perceived having less relative influence. Surprisingly, teachers, certified in early childhood education, who taught first- and second-grade, reported using inappropriate practices more frequently than the teachers who taught first- and second-grade and were certified only in elementary education. However, teachers, certified in early childhood, who taught third-grade, reported using inappropriate practices less frequently than teachers of third-grade who

were certified only in elementary education. The findings were consistent with the research, suggesting that developmentally appropriate practice was more commonly used in lower grades than in higher grades (Buchanan, *et al.*).

Building on previous studies, McMullen (1999) addressed the question, “What are the beliefs and characteristics of teachers who engage in best practices in early childhood education?” (p. 220). The sample included 20 educators of children, three years of age through third-grade. The first and most obvious difference reported was between preschool and primary teachers’ beliefs about DAP, which were statistically significant. Teacher demographic data, including years of employment and education, indicated that teachers with high DAP scores tended to have taken courses in early childhood or child development education at some point in their teaching careers. Similarly, primary teachers with preschool teaching experience were more likely to use DAP than those without preschool teaching experience

Maxwell, *et al.* (2001) tested the psychometric properties of a new observation measure of developmentally appropriate classroom practices in kindergarten through third-grade classrooms to determine how well classroom and teacher characteristics predicted developmentally appropriate classroom practices. Most measures of and research on the concept of developmentally appropriate practice focused on children from birth through kindergarten, thus, a new observational measure of developmentally appropriate classroom practices was needed. Maxwell *et al.* clarified that “much less work has been done to understand developmentally appropriate practice in the primary grades, and very few observation tools have been created specifically to measure developmentally appropriate practices in the early elementary grades” (p. 432). Because

the latter study used the same instrument as described in this study, construct validity and inter-rater agreement of the instrument findings were thoroughly discussed in Chapter 3.

Similar to the Buchanan *et al.* (1998) study, Maxwell, *et al.* (2001) addressed the question of why some classrooms were more developmentally appropriate than others. The researchers were particularly interested in determining whether teacher beliefs predicted practices, after controlling for other classroom and teacher characteristics. Classroom characteristics included grade, class size, and number of children with disabilities. Teacher characteristics consisted of education level, years of experience, and teacher beliefs. Sixty-nine kindergarten through third-grade classroom teachers in 40 public elementary schools in central North Carolina and central Kentucky were recruited. Approximately half of the teachers had master's degrees, while the other half had bachelor's degrees. The teachers' years of experience ranged from one year to 30 years. Teachers completed a demographic survey and were observed in their classrooms, using the APEEC, on average of 5 hours and 45 minutes. The results indicated that classroom characteristics, teacher characteristics, and teacher beliefs accounted for 42% of the variance in observed classroom practices, as measured by the APEEC. Classroom characteristics accounted for a total of 13% of the variance, while grade level accounted for most (10%) of the variance. Classrooms in kindergarten through first-grade were considered to be more individualized and developmentally appropriate than classrooms in the second- and third-grade. Teacher education accounted for 17% of the APEEC variance, while years of experience did not account for any notable significant part of the variance. Classrooms taught by teachers with a master's degree were noted as more developmentally appropriate than those taught by teachers with less education. Teachers

who reported beliefs that were more congruent with developmentally appropriate practice were teaching in a more developmentally appropriate manner than those whose beliefs were less developmentally appropriate. Similarly, classrooms of teachers who reported beliefs more congruent with developmentally inappropriate practice were observed to be less developmentally appropriate than those whose beliefs were not as developmentally inappropriate. According to Maxwell *et al.*, this study demonstrated a larger effect than that reported by Buchanan *et al.* The authors suggested the possible reason could be that they used multiple districts and a higher proportion of teachers with master's degrees.

### *Benefits of Developmentally Appropriate Practices*

#### *Research Studies on Long-Term Effects*

The critical impact of the developmental period of early childhood on later life success was well documented in educational literature (Schweinhart, Barns, & Weikart, 1993; Schweinhart & Weikart, 1997). The High Scope Perry Preschool Project was the most well known longitudinal study that followed a group of students from preschool through adulthood. The study examined the lives of 123 African Americans born in poverty and identified as being at high risk of failing in school. From 1962-1967, at ages 3 and 4, the subjects were randomly divided into two groups. One group received a high-quality preschool program based on High/Scope's active learning approach. The other group of children received no preschool program. In the most recent publication about the study, 95% of the original participants were interviewed at age 27 (Schweinhart *et al.*).

The results of the study were broken down into different areas, such as: (a) social responsibility, (b) earnings and economic status, (c) educational performance, and (d) commitment to marriage. By age 27, only 7% of the high-quality preschool group versus the no-preschool group members (35%) had been arrested five or more times. In addition, only 7% versus 25% had ever been arrested for drug dealing. The results for earnings showed that four times as many of the high-quality preschool group members (29%) earned \$2,000 or more per month versus the no-preschool group members (7%). Almost three times as many high-quality preschool members (36%) as no-preschool members (13%) owned their own homes. Significantly fewer high-quality program members received welfare assistance or other social services as adults. In regard to educational performance, 71% of the high-quality preschool group members graduated from high school or received a General Education Development certification; whereas, only 54% of the no-preschool group members graduated from high school or received a General Education Development certification. Earlier in the study, the high quality preschool program group demonstrated significantly higher average achievement scores at age 14 and literacy scores at age 19 than the no-preschool program group. Interestingly, the commitment to marriage revealed that the high quality preschool group member males had been married nearly twice as long as the no-preschool group member males. Five times (40% vs. 8%) as many of the high quality preschool group of females was married at the time of the age 27 interviews. Further, high quality preschool program member females had only about two thirds (57% vs. 83%) as many out-of-wedlock births as no-preschool program female members (Schweinhart *et al.*, 1993).

Because the High/Scope Perry Preschool study indicated that young people born in poverty had greater educational and economic success and half the crime rate if they attended a high-quality preschool program than if they did not attend a preschool program, it became imperative to address whether those benefits resulted equally from all curriculum approaches or from some more than from others (Schweinhart, & Weikart, 1997). Therefore, the High/Scope Preschool Curriculum Comparison Study assessed the relative effects through age 23 on young participants born in poverty of the High/Scope, Direct Instruction, and traditional Nursery School preschool curriculum models (Schweinhart, & Weikart). By 1967, Schweinhart and Weikart began assessing the three diverse preschool curriculum models with three distinct theoretical approaches to early childhood education. Moreover, there were clear-cut differences among the programs the children received. The Direct Instruction curriculum model represented a programmed-learning approach in which the children responded to the initiating teacher and initiated little on their own. The Direct Instruction model was devoted to behavioral learning principles because of the high focus on academics and required young children to respond to rapid-fire questions posed by teachers, rewarding them for correct answers. Direct teaching was accomplished mainly by teachers leading children in precisely planned question and answer lessons in language, mathematics, and reading. Teachers' guides and children's workbooks were the only materials in the classroom because they were considered to be the only materials that stimulated the requisite learning (Schweinhart, & Weikart).

In contrast to the Direct Instructional model, the Nursery School curriculum model represented a loosely structured, child-centered approach. Features of the Nursery

School model represented unit-based instruction with the teachers organizing class activities, discussions, and field trips around units or themes. Although the atmosphere was permissive, “teachers expected children to show good manners, cooperate, and observe limits” (Schweinhart, & Weikart, 1997, p. 120). According to Schweinhart and Weikart, children had freedom to choose activities, move from one activity to another, and interact with adults and peers. Developing the children’s social skills was given more attention than developing children’s intellectual skills.

The High/Scope curriculum model represented the open-framework approach, meaning that the children initiated much of their own learning. The High/Scope program was based on Piaget’s constructivist theory of child development. That is, “adults engaged children as active learners and arranged their classrooms in discrete, well-equipped interest areas” (Schweinhart, & Weikart, 1997, p. 120). The High/Scope model emphasized the plan, do, and review process so that children could engage in meaningful and active learning experiences. In other words, each day, children planned, carried out, and reviewed their own learning activities. The children were educated using small and large group activities, and were able to spend time outdoors. Instead of directing as was done by the Direct Instructional Model, teachers facilitated intellectual, social, and physical key experiences in children’s development (Schweinhart, & Weikart).

The results lead to the hypothesis that young people born in poverty would achieve greater success and manifest greater social responsibility if they attended a High/Scope or traditional Nursery School preschool program than if they attended a Direct Instruction preschool program. Schweinhart and Weikart (1997) documented that

well-implemented preschool curriculum models, through age 10, had about the same strong effect on children's intellectual and academic performance. By age 15, the measurement of outcomes was expanded to include community behavior. The Direct Instruction group reported committing 2 ½ times as many acts of misconduct as the High/Scope group. By age 23, the High/Scope and Nursery School groups had additional significant advantages over the Direct Instruction group. The High/Scope and Nursery School group needed significantly less treatment (6%) for emotional impairment or disturbance during their schooling compared to (47%) of the Direct Instruction group. In regard to volunteer work, 43% of the High/Scope group and 44% of the Nursery School group had at some time participated in volunteer work, as compared to 11% of the Direct Instruction group. Only 10% of the High/Scope group had ever been arrested for a felony, as compared to 39% of the Direct Instruction group. None had ever been arrested for a property crime, as compared to 38% of the Direct Instruction group. Thirty-one percent of the High/Scope group had married and were living with their spouses, whereas none in the Direct Instruction group were married. Additionally, 70% of the High/Scope group planned to graduate from college, as compared to 36% of the Direct Instruction group (Schweinhart, & Weikart). Overall, Schweinhart and Weikart found notable evidence that child-initiated learning activities seemed to help children develop their social responsibility and skills so that they needed treatment for emotional impairment less often and were less often arrested for felonies as young adults.

#### *Research Studies on Student Achievement*

Closely resembling Schweinhart and Weikart's (1997) curriculum model study, Marcon (1992) compared three preschool curriculum models to academic achievement of

295 four-year olds in the Washington, DC school district. Three groupings, identified through cluster analysis, were selected as examples of the three distinct preschool models: (a) child-initiated classrooms, (b) academically directed classrooms, and (c) middle-of-the-road classrooms. The researchers used the classroom edition of the Vineland Adaptive Behavior Scales and the District's Early Childhood Progress Reports to compare preschoolers' development. Procedures, such as classroom observations by research assistants and test-retest reliability among the teachers' beliefs, occurred. The findings indicated that the mean Vineland scores of children enrolled in middle-of-the-road classrooms were consistently lower than scores of children enrolled in either child-initiated classrooms or academically directed classrooms. Children enrolled in child-initiated programs scored significantly higher than middle-of-the-road classrooms on overall Adaptive Behavior, Communication, and Motor Skills. Children enrolled in academically directed classrooms also scored significantly higher than middle-of-the-road classrooms on overall Adaptive Behavior, Communication, and Socialization. Progress report scores of middle-of-the-road classrooms were, again, consistently lower than scores of child-initiated programs and academically directed programs. Child-initiated classrooms had significantly higher grades overall than middle-of-the-road classrooms and demonstrated significantly greater mastery of early math/science skills, verbal skills, social/work habits, and physical skills. Similarly, children enrolled in academically directed classrooms had significantly higher grades overall than middle-of-the-road classrooms and had mastered significantly more in math/science skills, verbal skills, and physical skills. Finally, children in child-initiated programs did significantly better than children in the academically directed programs in all areas measured,

including overall grade point average, math/science skills, verbal skills, social/work habits, and physical skills. Building on her 1992 study, Marcon (1999) presented data on development and early learning of inner-city children using three cohorts. Results again indicated that children in the child-initiated model demonstrated greater mastery of basic skills than did children in programs in which academics were emphasized and skills were taught. These results were especially noteworthy because findings were replicated with two additional cohorts.

A few years later, Marcon (2002) conducted a follow-up study to examine the preschool influence on later school success with the same cohort of children that attended two years of preschool prior to entering first grade. These children, who began preschool in one of the three models, were studied again in third-grade (Year 5) and again in fourth-grade (Year 6). The follow-up sample from the original cohort was 96% African American and 46% male. Recovery rate from preschool to fourth grade was 64% of the original sample, which was high, according to Marcon (2002). Regarding retention, results indicated no significant difference in retention rate to preschool model was found for girls, but was found for boys. Boys from the academically directed preschool had a significantly lower rate of retention prior to third-grade than did boys who had attended other types of preschools. Regarding report cards, no significant main effect for preschool model was found in third-grade overall GPA or in any specific subject area for on schedule or retained children. Stated differently, at the end of third-grade, children from the three different preschool models were performing academically at a comparable level. Teachers did, however, indicate that the behavior of the children from the academically directed preschool programs was notably poorer than that of their peers.

By fourth grade, a trend emerged towards a statistical significance between preschool models favoring the child-initiated program. GPA scores for the students in the child-initiated preschool program in the fourth-grade were 4% higher than students in the middle-of-the-road preschool program and 14% higher than students in the academically directed preschool program. The calculated effect size for this difference was .38, which the researcher reported to be moderate. Finally, in all subject areas, except music, fourth-grade students from the academically driven preschools displayed the lowest grades. Notably, fourth-grade students from the child-initiated preschool program had the highest grades compared to peers who had other types of preschool experiences. Additionally, by the end of fourth-grade, the students' achievement from academically directed preschool classes began to decline, and their behavior continued to be poorer than that of their peers by 14% and 9%, respectively. Regarding gender differences, Marcon (2002) revealed that girls earned about 10% higher GPA scores than boys, with a moderate effect size for this difference of .34. Girls also demonstrated greater scores than the boys on citizenship grades, with girls' behavior about 24% better than that of boys, with a large effect size for this difference of .58. By fourth grade, girls were still receiving about 13% higher grades than boys with an effect size for the academic difference of .44 and an effect size difference of .76 in citizenship grades. Marcon (2002) concluded that preschool model or kindergarten experience did have an influence on children's later school achievement. Children whose early years included child-initiated programs fared better during the transitions from primary through later elementary school grades than peers who did not experience child-initiated programs.

Hyson *et al.* (1990) conducted the Academic Environments study investigating 10 preschool programs using the newly developed instrument, *The Classroom Practices Instrument* (CPI). A total of forty-seven programs were observed, with more than one observer visiting most of the programs. Observers were trained using the NAEYC guidelines before any observations were conducted. Results indicated that, at age 4, there was a weak negative relationship between CPI scores and children's cognitive development. In other words, the children who attended the more formally academic preschool programs had a slight edge in academic skills at age 4. However, when a follow-up was conducted by Hyson *et al.*, using a sub-sample of the children from the Academic Environments study, it was found that the academic skills differences had disappeared. In fact, Hyson *et al.* noted that virtually all children in the study, regardless of the academic emphasis of their preschool program, performed in a highly competent fashion on the follow-up measures. Creativity among the children was also measured using two instruments: (a) Classroom Behavior Inventory and (b) Thinking Creatively in Action and Movement. Findings indicated that children in developmentally appropriate programs tended to be rated as more creative, both by teachers and by experimenters. Anxiety in a testing situation was examined and revealed that the less relaxed children tended to be from programs scoring lower in developmental appropriateness on the CPI. Caution should be used when interpreting these findings because the correlations and group differences in the study were relatively small. That is, only modest differences were detected. Hyson *et al.* recommended that further research in these areas, including a larger and more socioeconomically diverse sample, was needed.

Stipek, Feiler, Daniels, and Milburn (1995) investigated the effects of alternate instructional approaches found in existing preschool and kindergarten programs on young children's achievement and motivation. In order to determine whether different instructional approaches had different effects on poor and middle-class children, the sample included a diverse group of economically disadvantaged minority children as well as middle class children. Thirty-two classrooms participated, with 63 in didactic and 59 in child-centered classrooms. The classrooms that were chosen for the study had reputations of being either child-centered or of having a structured program that emphasized basic skills. Several observational measures, such as the Early Environment Rating scale and Classroom Practices Inventory, were used. Assistants with extensive training in testing procedures assessed the children individually with a variety of measures, including interviews and the use of the Woodcock-Johnson Achievement Test. In regard to achievement, results indicated a contradictory outcome compared to other studies. The children in the didactic programs performed better than children in child-centered programs. The mean total score in letters/ reading achievement for the didactic classrooms was 27.13, compared to a mean of 21.89 in the child-centered classrooms. The mean total score in numbers achievement for the didactic classrooms was 28.93, compared to a mean of 27.94 in the child-centered classrooms. However, significance was found only on letters/ reading achievement, not numbers achievement. The effect size for letters/reading achievement was not calculated but would have provided more insight. Regarding perceptions of ability, a significant program main effect revealed that children in child-centered programs rated their abilities higher than children in didactic programs. Children in didactic programs tended to have negative outcomes on most of

the motivation measures. Compared to children in child-centered programs, children in didactic programs rated their abilities significantly lower, had lower expectations for success on academic tasks, showed more dependency on adults for permission, evidenced less pride in their accomplishments, and claimed to worry more about school (Stipek *et al.*). Stipek *et al.* found one achievement benefit of the didactic classrooms, but they warned readers that didactic programs came with some costs by making the following statement:

We do not know whether the negative effects of didactic early childhood programs have long-term negative effects on achievement. It is conceivable that the greater dependency and anxiety and lower perceptions of competencies, expectations, and pride in accomplishment associated with didactic programs will, eventually, inhibit constructive learning behaviors and, therefore, learning. (p. 220)

Various studies also showed that more developmentally appropriate teaching in kindergarten predicted greater success in the early grades (Burts *et al.*, 1993; Huffman, & Speer, 2000). Burts *et al.* (1993) hypothesized “inappropriate instruction may place children at risk for a host of problems including later academic failure and psychological and social problems” (p. 23). The Burts *et al.* study explored the relationship between the developmental appropriateness of kindergarten classroom instruction and first-grade report card grade overall averages as well as individual averages in reading, language, spelling, math, science, and social studies. Report card achievement grades were known to be subjective, which could be considered a limitation in this study. The sample consisted of 166 first-grade children who had attended kindergarten classrooms with teaching practices characterized as either developmentally appropriate or developmentally inappropriate. The sample for the study consisted of 166 first-grade

children. Eighty-eight children were from the more developmentally appropriate kindergarten classrooms, whereas 78 children were from the more developmentally inappropriate kindergarten classrooms. Other variables included: (a) 76 low SES, 90 high SES; (b) 79 male, 87 female; and (c) 60 African-American, 106 Euro-American. Analysis of variance (AVOVA) was conducted for overall academic averages. Academic averages and subject area average grades were the dependent variables. Like Marcon's 2002 study, the results indicated that females had higher averages than males (Female M = 3.32, Male M = 2.92). The ANOVA produced a significant main effect for SES (Low M = 2.93, High M = 3.30). The ANOVA also produced a significant interaction of classroom type (Appropriate, M = 3.23, Inappropriate, M = 3.01). The analysis indicated that high SES children from less developmentally appropriate kindergarten classrooms had higher overall academic average report card grades than low SES children from less appropriate classrooms. Notably, no significant differences were found between overall academic averages of high and low SES children. Additionally, low SES children from more appropriate kindergarten classrooms had higher overall academic averages than low SES children from less appropriate kindergarten classrooms. Children from more developmentally appropriate kindergarten classrooms had higher average reading grades than children from less developmentally appropriate kindergarten classrooms. Burts *et al.* viewed this finding worthy of note because "teachers in the less appropriate kindergarten classrooms placed much more emphasis on direct reading instruction than teachers in the more appropriate classrooms" (p. 29).

Huffman and Speer (2000) researched academic performance among at-risk children on the effect of developmentally appropriate teaching practices on kindergarten

and first-grade children attending urban schools. The sample included 113 mostly African American and Hispanic at-risk kindergarten and first grade children participating in the Head Start Public School Transition Project. This project was a national demonstration effort examining the effects of providing social and educational services to Head Start children as they progressed from kindergarten to third-grade. The research design included an experimental group and a control group. In the experimental group, the participants received additional social and educational services, whereas the participants in the control group provided no additional services. As a result, two cohorts of children were longitudinally followed from kindergarten to third-grade. Prior to classroom observations, teachers who taught in the experimental group received special DAP training in a three-day workshop on theoretical implications as well as DAP teaching practices. After the workshop, Huffman and Speer conducted a one-way ANOVA to detect any differences among teachers in the use of DAP practices between the experimental and the control teacher group. No significant differences were found, indicating the three-day workshop probably did not change the teachers' style of teaching. Because of this, the original control and experimental groups were dropped. Instead, the 28 classrooms were divided into two groups based on the level of DAP indicated as measured by the Assessment Profile for Early Childhood Programs. It was noted by Huffman and Speer that the highest DAP scoring teachers, in reality, were moderate users of DAP. To examine whether children in the more developmentally appropriate classrooms fared better on academic tests than did the children in the less developmentally appropriate classrooms, repeated measures MANOVA was conducted. Child gender and DAP level were not found to be significant. As expected, first-grade

children scored higher than kindergarten children, and children scored higher in the spring semester than in the fall semester. The results also revealed that achievement was significantly higher in the more developmentally appropriate for letter/ word identification and applied problems, over time. Huffman and Speer indicated that developmentally appropriate practices could improve children's achievement in urban settings. Although Huffman and Speer acknowledged the high DAP teachers were essentially rated as moderate users of developmentally appropriate practices, caution should be exercised when interpreting the results. A similar study with teachers actually at the high end of employing developmentally appropriate practices would provide additional information to support or refute Huffman and Speer's findings.

#### *Research Studies on Social Outcomes*

Although both DAP and traditional academic approaches have been shown to be associated with successful learning outcomes, other studies reveal additional far reaching positive outcomes affecting children who were in DAP environments (Burts, Hart, Charlesworth, & Kirk, 1990; Burts, Hart, Charlesworth, Fleege, Mosley, & Thomasson, 1992). Prior to the 1990s, there was very little research conducted in classrooms with young children documenting the relationship between potential stressors and academic, psychological, and social behavior (Burts *et al.*, 1990). Because of concern that young children's stress symptoms increased as academic pressures on young children increased, such as with high stakes testing, Burts *et al.* laid the initial foundation of examining stress behaviors exhibited by children in developmentally appropriate and developmentally inappropriate classrooms. Several definitions of stress were cited by Burts *et al.*, such as: (a) response of the body to any demand, (b) a nonspecific response of the body to any

demand that exceeds the person's ability to cope, or (c) a mental state in response to strains or daily hassles.

The sample for the study consisted of 37 kindergarten children, ages five or six, enrolled in either of two classes: (a) developmentally appropriate classroom or (b) developmentally inappropriate classroom. The two classrooms used in the study were located in the same school in a small southern school district. Classrooms were selected based on questionnaire scores, classroom observations, and willingness to participate in the study.

Burts *et al.* (1990) briefly characterized the findings of the developmentally appropriate classroom as "having significantly more child-selected center time, group story, and transitions, and less whole group and workbook/worksheet activities when compared to the less developmentally appropriate classroom" (p. 416). Overall, subjects in the more developmentally inappropriate classroom exhibited significantly more stress behaviors than children in the more developmentally appropriate classroom. Children also displayed more stress behaviors during whole group and workbook/ worksheet activities in the more inappropriate classroom than did children in the more appropriate classroom. However, children in the developmentally appropriate classroom exhibited higher levels of stress during center and transition activities. However, the higher stress levels only occurred in the last 10 minutes of center time. Center activity was also conducted differently in the developmentally inappropriate classroom. Only four or five children were allowed in the centers at a time, while the majority of the class was in a large group with teacher directed instruction or working on workbook/ worksheet activities. The length of time in centers was much less than the length of time in centers

for the developmentally appropriate classroom. The length of whole group and workbook/ worksheet activities was much greater than the length of time in whole group activities for the developmentally appropriate classroom. Other characteristics of the developmentally inappropriate classroom included instructional strategies revolving around teacher-directed (a) whole group activities, (b) paper-and-pencil tasks, and (c) fragmented transitions (Burts *et al.*, 1990). The developmentally appropriate classroom displayed the opposite of the other classroom because the “learning opportunities were child-initiated center activities with daily reading of books by the teacher and minimum number of whole group transitions” (p. 418). It was also worthy to note that this study found marginal gender differences between males and females. Males exhibited more total stress behaviors than females. Burts *et al.* (1990) asserted that the gender differences were consistent with the literature, which indicated that male children tended to be more vulnerable to stress than female children. Caution should be exercised in interpreting the findings from this study because only one school was used with a small sample size.

As a follow-up to Burts *et al.* (1990) study, Burts *et al.* (1992) investigated the relationship between developmentally appropriate and inappropriate instructional practices and the observed stress behaviors of kindergarten children, while extending their prior work to include the interactive effects of gender, SES, and race with stress. The sample size in the Burts *et al.* (1992) study was considerably larger than in the previous study. Burts *et al.* (1992) investigated stress factors of 204 kindergarten children (n = 101 children in inappropriate classrooms, n = 103 children in appropriate classrooms) in a public school district located in a medium-sized southern city. Measures

used in the Burts *et al.* (1992) study were: (a) teacher questionnaire/ The Teacher Beliefs Scale; (b) checklist using the NAEYC guidelines; and (c) Classroom Child Stress Behavior Instrument, as well as scan sampling.

The overall results of Burts *et al.* (1992) study replicated the Burts *et al.* (1990) study, indicating a significant main effect of classroom type on total stress scores. That was, children in inappropriate classrooms exhibited more overall stress behaviors than did children in appropriate classrooms. In regard to gender, once more, the analysis indicated that boys in inappropriate classrooms displayed more total stress behaviors than did boys in appropriate classrooms. In regard to SES and race, the researchers discovered that low SES African American children exhibited significantly more total stress behaviors than did low SES white children, regardless of classroom type. Further, white children displayed significantly more stress behaviors in inappropriate classrooms when compared with black children in inappropriate classrooms during group story activities. However, during whole group learning, black children exhibited more stress behavior in inappropriate classrooms. In appropriate classrooms, no differences were found between African American and white children for whole group learning and story activities. Further, univariate tests revealed significant effects for transition, waiting, and workbook/ worksheet stress scores with more stress behaviors during these activities in inappropriate classrooms than in appropriate classrooms. Low SES children participated in significantly less center time and in significantly more workbook/ worksheet activities, when compared with high SES children. In regard to race, white children in inappropriate classrooms participated in more music, group story, and workbook/ worksheet activities, and in less whole group, transition, and waiting, when compared to

African American children. Notably, no significant race differences in these activity types were found for children in developmentally appropriate classrooms. Burts *et al.* (1992) concluded, “empirical evidence was mounting to support the contention that developmentally inappropriate curricula are potentially harmful to young children” (p. 314).

### *Summary of the Literature*

There was a recent paradigm shift to a more constructivist approach in the way in which children are educated in early childhood. Even though a constructivist approach has deep, philosophical roots, one can regard the approach as a contemporary and developmentally appropriate way to educate children. DeVries and Zan (1995) offered an appropriate definition for constructivism as a developmentally appropriate approach, inspired by Jean Piaget, in which children actively construct knowledge through social, moral, and intellectual constructs. In regard to the paradigm shift, the behaviorist approach had been the traditional form of teaching. The behaviorist teacher was accustomed to teaching children by telling and challenging children to absorb all the information put before them. Elkind (2004) called this approach filling up the containers from one year to the next. Thus, the behaviorist teacher directed the learning and did most of the ‘doing’ and the ‘talking’. DeVries *et al.* (2002) argued that the behaviorist teacher must shift from being directive to allowing the children to be active.

Developmentally Appropriate Practice (DAP) was a philosophy of early childhood education, inspired by NAEYC, that considered the whole child when designing early childhood programs or curriculum. Three factors were examined: (a) the age of the child, (b) the developmental level of the child, and (c) the environment from

which the child comes. Hemmeter *et al.* (2001) designed the *Assessment of Practices in the Early Elementary Classroom* (APEEC). This instrument was considered valid in determining if a K-3 classroom was DAP. That is, it truly measured the theoretical constructs of DAP. The rater, however, had to have a solid understanding of DAP. The components of the APEEC were centered on three themes: (a) Physical Environment, (b) Instructional Environment, and (c) Social Environment.

Regarding teacher certification for developmentally appropriate practices, the literature was mixed. Maxwell *et al.* (2001) suggested that teachers with less experience might implement more developmentally appropriate practices due to more recent training in early childhood development. On the other hand, as veteran teachers learned from their experiences with young children and became more comfortable in their role as teachers, they might adopt more developmentally appropriate practices. In addition, as Dunn and Kontos (1997) presented, in-service training might also make a difference in implementing developmentally appropriate practices.

A growing body of research on developmentally appropriate early childhood programs suggested positive benefits for young children in academic, social, or behavioral domains. Positive long term effects of DAP might include higher rates of high school graduation, fewer arrests and acts of misconduct, higher commitment to marriage, and higher incomes among adults who had participated in the High/Scope Perry Preschool Program (Schweinhart *et al.*, 1993; Schweinhart, & Weikart, 1997). Academic performance in the early school grades was found to be better among children who attended developmentally appropriate preschools (Marcon, 1992, 1999, 2002). In a study of three different instructional approaches in preschool, Marcon (1999) found that

child-initiated instructional methods generally had more positive academic outcomes than academically directed programs. In fact, a replication of findings with two additional cohorts was very noteworthy (Marcon, 1999). First-grade children from more developmentally appropriate kindergartens were also found to have higher grades in reading than children from less developmentally appropriate kindergartens (Burts et al., 1993). Furthermore, primary grade teachers rated children who had attended developmentally inappropriate kindergarten classrooms lower in behavior. In other words, the children who attended the developmentally inappropriate classrooms exhibited more behavior problems than the children who attended the DAP classrooms. In contrast to academic performance, Stipek *et al.* (1995) found that, although there were costs with regard to children's academic motivational factors, children from highly structured, basic skills preschool and kindergarten programs performed better on standardized letter/reading achievement tests than children from child-centered programs. However, there were no significant differences found on the math achievement tests. Stipek *et al.* also found that children in didactic programs tended to have negative outcomes on most of the motivation measures, rated their abilities significantly lower, had lower expectations for success, showed more dependency on adults, and claimed to worry more about school. Regarding stress, Burts *et al.* (1990, 1992) found that more overall stress was exhibited by children in developmentally inappropriate classrooms than by children in appropriate classrooms. Boys, more so than girls, did not adjust well to didactic early learning approaches. In general, boys showed more stress behaviors in developmentally inappropriate kindergartens. Burts *et al.* (1990) noted, "Since children today experience much stress in their lives, additional stress from an inappropriate curriculum may leave

children even more vulnerable and unable to cope effectively” (p.417). When considering social and emotional effects, the body of research linked developmentally inappropriate practices with negative social outcomes for children.

Revealed in most studies and portrayed in this literature review, there was clearly a need for more empirical evidence for achievement outcomes related to DAP. Even fewer studies explored the relationship between developmentally appropriate and inappropriate practices to achievement test score data in the primary grades. In summary, as Stipek *et al.* (1995) noted, “Although recent evidence tends to support developmentally appropriate approaches, existing evidence is not sufficient or consistent enough to confidently proclaim the superiority of either approach for achievement outcomes.” (p. 210)

## CHAPTER 3

### METHODOLOGY

The purpose of the study was to investigate the use of developmentally appropriate practices by third-grade teachers in selected systems in East Tennessee. Specific attention was given to teacher characteristics and CRT/TCAP scores. Teacher characteristics included teacher certification, type of degree, highest degree earned, and years of experience. Student CRT/TCAP scores included achievement in Reading/Language and Math.

Although the majority of the previous research studies indicated positive academic and social benefits for children, many questions still existed about developmentally appropriate practices. It was the purpose of this study to determine if DAP techniques had similar benefits in the primary grades as they had been found to have in preschool and kindergarten. Variables used in this study were directly or indirectly linked in various ways to school achievement. Because of the demonstrated importance of socioeconomic factors on CRT scores, every effort was made to select schools that were similar in socioeconomic make-up. This chapter includes information on the research design, the target population and sample, instrumentation, procedures, and data analysis used in this research.

#### *Research Design*

This study was designed to use descriptive and inferential methods for data analysis. A quantitative research design was chosen for this study to discover if an association existed between the given variables. Quantitative research was defined by

Gall, Gall, and Borg (2003) as “inquiry that is grounded in the assumption that features of the social environment constitute an objective reality that is relatively constant across time and settings.” (p. 634). By choosing a quantitative research design, it was possible to determine whether or not the difference between mean scores had statistical and practical significance.

### *Population and Sample*

The population consisted of all third-grade teachers and their students in five school systems located in Upper East Tennessee. All of the participating schools were public school systems and all included grades kindergarten through fourth-, fifth-, or eighth-grade. Third-grade was chosen as the focus of this study for two reasons. First, the *No Child Left Behind* Act mandated that all third-grade students in Tennessee public schools must take the Tennessee Comprehensive Assessment Program (TCAP) exam, and these scores were reported by the Tennessee State Department of Education. Second, third-grade was chosen because various research studies, as shown in the literature review, suggested that high stakes testing decreased the number of developmentally appropriate practices in the classroom. Stated differently, as high stakes testing increased the demands on academic achievement, teachers might be more inclined to use traditional teaching approaches. Because there was little consistency and replication in primary practices, it was hoped that this study would add to the understanding of developmentally appropriate practices in the primary grades.

This study used a cluster sample of third-grade classrooms within five school systems located in Upper East Tennessee. A cluster sampling method was selected

because it was more feasible to select groups of individuals in classrooms, rather than individuals from the defined population at large (Gall *et al.*, 2003).

Five school systems were selected, including city and county systems, located in Upper East Tennessee. Because socioeconomic factors were found to be associated with student achievement, the selected systems were examined in order to identify schools with similar socioeconomic characteristics. Table 1 shows the similarities of the schools' characteristics. Based on these criteria, thirty third-grade classrooms within 11 schools that had similar SES characteristics for this study were chosen. The percentage of economically disadvantaged for each of the schools ranged from 52% to 59%. All schools were Title I, and each school had obtained the NCLB good standing status. The participative teachers' previous TCAP scores prior to the study as well as throughout all observations were unknown. In order to maintain integrity of the study, TCAP/CRT 2004-2005 scores were collected after all observation scores were calculated.

Table 1

*Characteristics of Participating Schools*

School	Percentage of Economically Disadvantaged (Rounded)	NCLB Status	Percent Caucasian (Rounded)	Total Student Population (Rounded)	Funding Status
A	57	Good	96	500	Title 1
B	56	Good	97	640	Title 1
C	56	Good	83	450	Title 1
D	52	Good	100	470	Title 1
E	54	Good	84	360	Title 1
F	57	Good	99	260	Title 1
G	55	Good	96	290	Title 1
H	59	Good	74	460	Title 1
I	52	Good	100	460	Title 1
J	59	Good	98	230	Title 1
K	54	Good	100	340	Title 1

Based on Report Card 2004 (TN Department of Education, 2004)

*Instrumentation**Assessment of Practices in Early Elementary Classrooms*

The APEEC instrument was used to assess the extent to which developmentally appropriate practices were used in the third-grade classrooms. Because little work had been done to understand developmentally appropriate practices in the primary grades, Hemmeter *et al.* (2001) developed the APEEC to provide a useful tool for both practitioners and researchers wanting to understand elementary school practices (K-3) in general education classrooms serving children with and without disabilities. Hemmeter, *et al.* used the NAEYC guidelines for developmentally appropriate practice and recommended practices for early childhood special education programs as the framework for developing items. Information on the validity of the APEEC was collected from 69

classrooms in North Carolina and Kentucky. The authors provided estimates of construct validity by comparing the APEEC to two other measures of developmentally appropriate practice instruments, which produced modest to high correlations (.59). Overall, extensive field-testing analyses revealed that the APEEC was a valid and reliable tool for measuring individualized and developmentally appropriate practices in K-3 classrooms. Written permission to use this instrument was obtained from the primary author of the APEEC.

The APEEC measure was similar to the *Early Childhood Environment Rating Scale* (ECERS), but it was exclusively designed for the early grades of elementary school. The APEEC included items designed to measure individualized and developmentally appropriate practices (McCormick, Anderman, Grisham-Brown, & Hemmeter, 2002). The format included 16 items divided into three broad categories of classroom practices: (a) physical environment, (b) curriculum and instruction, and (c) social context. Items were arranged using a 7-point continuum with descriptors at the “1”, “3”, “5”, and “7” anchors. Each descriptor was scored as *true*, *not true*, or *N/A*. Each teacher received a total APEEC score by calculating the sum of the items that made up the measures, divided by the number of items. Therefore, on the 7-point continuum, higher scores were intended to reflect more developmentally appropriate practices, exemplary teaching or higher quality classrooms (McCormick *et al.* 2002). A low score indicated inadequate teaching practices and/or a deficient classroom environment. The descriptive title for each of the 16 items is included in Appendix E.

### *Tennessee Comprehensive Assessment Program*

Academic outcomes were measured using the TCAP Achievement Test. The TCAP Achievement Test, a standardized test that uses multiple-choice questions, provided a measure of knowledge and application skills in various subjects for grades K-8. Specifically, the test for grade 3 included reading, language arts, mathematics, science, social studies, and word analysis. The TCAP Achievement test was mandated for all students in grades 3-8. It was not required for grades K-2; however, school systems could elect to test students in kindergarten, first-grade, and/or second-grade (TN Department of Education, 2004).

The TCAP achievement test provided both norm-referenced and criterion-referenced information. For this study, criterion-referenced information was used because the items measured student performance, according to specific standards rather than compared to the performance of other test takers. Criterion-referenced items were directly aligned with the Content Standards and State Performance Indicators (TN Department of Education, 2004). The TCAP/CRT Achievement Test also reported students' level of performance information using a semantic scale. Those levels were: (a) Below Proficient, (b) Proficient, and (c) Above Proficient.

### *Demographic Survey*

In order to gain more insight into the teacher participants in the study, a demographic questionnaire was designed. The questions included general information about teacher characteristics, including age, experience, years of service, type of degree, highest degree earned, and degree granting institution (Appendix C).

### *Procedures*

After approval from the Institutional Review Board at East Tennessee State University (Appendix A), a letter was sent to five directors of schools, requesting permission to access achievement CRT scores and to conduct research in randomly selected third-grade classrooms within their systems (Appendix B). After approval at the system level, the requests were referred directly to the principals of the selected schools. After receiving permission from the principals, letters (Appendix B) were either mailed or hand delivered to the teachers selected for the study. The schools were chosen because of their location and SES similarities. Principals at the participating schools allowed contact with the school's third-grade teachers to solicit their cooperation with the study. Thirty third-grade teachers agreed to allow observation in their classrooms for at least half of the day. Six of the teachers contacted were not willing to participate.

Between January and March of 2005, all 30 classrooms in the study were observed for approximately half a day (four hours) using the APEEC to ascertain the DAP score. All observations were completed before the end-of-year TCAP test. All 30 teachers were observed and rated in their classrooms. Inter-rater agreement data were available for three of the classrooms. Inter-rater reliability referred to the extent to which the observers agreed with each other during actual data collection (Gall *et al.* 2003). In order to obtain inter-observer reliability, two observers were in the same classrooms at the same time. Initially, the first classroom was viewed to set the standard for consistency; another observation was conducted halfway through the study and again during the last set of observations. The scores were averaged to determine the item and total calculations of the APEEC when both observers were present. Only three items had

a one point discrepancy on exact agreement, and the percentage of exact agreement across all 15 items was 100% agreement within one point (See Appendix E). Because some of the classrooms did not include children with disabilities, the item was considered not applicable (N/A). The observers met to review the instrument thoroughly and to appraise the NAEYC guidelines. Both observers had similar education, training, and experience to increase agreement on inter-observer reliability, as well as having the knowledge base to complete the APEEC accurately.

Teachers were given a short demographic survey (Appendix C) to complete at each observation. After observations, if needed, clarification questions were asked to ensure accurate scoring (Appendix D). Total APEEC scores were then calculated to investigate each research question.

### *Data Analysis*

This study described third-grade teachers' use of developmentally appropriate practices and the demographic characteristics of third-grade teachers through descriptive and inferential analysis. This study also investigated differences in practices among teacher characteristics and investigated the relationship between DAP and CRT scores of third-grade classrooms in East Tennessee. The findings of the study were analyzed using the Statistical Package for the Social Sciences (SPSS) software program, which is designed to analyze and display data (Green, & Salkind, 2004).

Three questions guided this research:

1. What is the demographic profile of the third-grade teachers?

2. Are there any differences in DAP levels as measured by the APEEC among teacher characteristics, such as teacher certification, college major, highest degree earned, years of experience, knowledge of DAP, and degree granting institution?
3. Is there an association between third-grade teachers' use of DAP as measured by the APEEC and students' achievement on standardized tests in Reading/Language and Mathematics as measured by the TCAP/CRT?

Research question 3 was selected as the primary focal point of the investigation, whereas, research questions 1 and 2 provided additional insight into the teacher participants and teaching practices. From research question 2, nine null hypotheses were developed and analyzed. From research question 3, an additional eight null hypotheses were developed.

#### *Hypotheses for Research Question 2*

- Ho2<sub>1</sub>: There are no differences between teacher certification and teachers' use of DAP practices.
- Ho2<sub>2</sub>: There are no differences between teacher college major and teachers' use of DAP practices.
- Ho2<sub>3</sub>: There are no differences between teacher highest degree type and teachers use of DAP practices.
- Ho2<sub>4</sub>: There are no relationships between teacher years of experience and teachers' use of DAP practices.
- Ho2<sub>5</sub>: There are no differences among teachers with varying levels of knowledge and their physical environment DAP practices.

Ho2<sub>6</sub>: There are no differences among teachers with varying levels of knowledge of DAP and their instructional DAP practices.

Ho2<sub>7</sub>: There are no differences among teachers with varying levels of knowledge of DAP and their social context DAP practices.

Ho2<sub>8</sub>: There are no differences among teachers with varying levels of knowledge of DAP and their total DAP practices.

Ho2<sub>9</sub>: There are no differences between teacher degree granting institution and teachers' use of DAP in the classroom.

*Hypotheses for Research Question 3*

Ho3<sub>1</sub>: There is no association between the classroom physical environment score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>2</sub>: There is no association between the classroom physical environment score and student achievement CRT/TCAP scores in Math.

Ho3<sub>3</sub>: There is no association between specific instructional techniques score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>4</sub>: There is no association between specific instructional techniques score and student achievement CRT/TCAP scores in Math.

Ho3<sub>5</sub>: There is no association between the classrooms' social context score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>6</sub>: There is no association between the classrooms' social context score and student achievement CRT/TCAP scores in Math.

Ho3<sub>7</sub>: There is no association between the classrooms' overall APEEC score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>8</sub>: There is no association between the classrooms' overall APEEC score and student achievement CRT/TCAP scores in Math.

A quantitative analysis was used to answer the research questions. In answer to research question 1, descriptive analyses in the form of frequency tables were used to describe the teacher demographic characteristics. Research question 2 was analyzed using independent samples *t* tests, analyses of variance (ANOVAs), and Pearson product-moment correlation coefficients to explore if there were any associations in DAP levels

based on the given teacher characteristics. Research question 3 was analyzed by using a one-way analysis of variance to assess the relationships between the dependent variables (*TCAP/CRT* scores) and independent variables (environment, instruction, and social context).

### *Summary*

Chapter 3 presented the research design, population and sample, instrumentation, and statistical procedures used for data analysis. This study used quantitative procedures to analyze developmental appropriateness as it related to teacher characteristics and student achievement scores. This study used a cluster sample of 30 third-grade classrooms in various Upper East Tennessee school systems. All classrooms were observed by two trained raters, with a subset of these classrooms observed by one of the raters to determine inter-observer reliability. Each participating teacher completed a demographic survey. Participating teachers were observed for at least half a day and were asked interview questions for clarification, if needed. Chapter 4 provides an analysis of the data, and Chapter 5 includes implications, conclusions, and recommendations for further consideration.

## CHAPTER 4

### ANALYSIS OF DATA

The importance of a high quality classroom environment, an instructional and stimulating learning environment, as well as a positive social atmosphere in the primary grades cannot be underestimated. Because teachers have a great deal of influence on student learning, a study of developmentally appropriate practices and their relationship to academic achievement is relevant. The purpose of this study was to determine if a relationship existed between student achievement scores and classroom practices used among third-grade teachers in Upper East Tennessee.

Three research questions guided the study and 16 hypotheses were tested. An initial analysis of data incorporated simple descriptive statistics in the form of frequency tables. Analyses of variances (ANOVAs), independent samples t-tests, and correlation coefficients were used to determine if there were associations between DAP levels and teacher characteristics. One-way analysis of variance assessed the relationships between the dependent variables (*TCAP/CRT* scores) and independent variables (environment, instruction, and social context). Data were gathered from classroom observations, teacher surveys, and *TCAP/CRT* achievement scores. In the text that follows, each research question is presented, followed by the associated analysis.

#### *Participating Teachers*

Thirty teachers within five school systems voluntarily participated in the study. All teachers observed were within eleven schools that had similar SES characteristics.

The participating teachers' previous TCAP scores prior to the study as well as throughout all observations were unknown. In order to maintain the integrity of the study, TCAP/CRT 2004-2005 scores were collected after all observation scores were calculated.

*Research Question 1*

What is the demographic profile of the third-grade teachers? Thirty third-grade teachers in Upper East Tennessee completed a demographic survey. All teachers were considered highly qualified. The mean total years taught was 18.60 ( $SD = 12.36$ ), while the mean total years of teaching third-grade was 10.90 ( $SD = 9.86$ ). Additional teacher demographic characteristics are presented in Table 2.

Table 2

*Demographic Profile of Third-Grade Teachers*

Demographic		<i>n</i>	%
College Major:	Early Childhood	3	10.0
	Elementary Education	21	70.0
	Other	<u>6</u>	<u>20.0</u>
	Total	30	100.0
Type of Teacher Certification:	Early Childhood	1	3.3
	Elementary Education	25	83.3
	Other	<u>4</u>	<u>13.4</u>
	Total	30	100.0
Highest Degree Obtained:	Bachelor's	14	46.7
	Master's or Above	<u>16</u>	<u>53.3</u>
	Total	30	100.0
Degree Granting Institution:	ETSU	18	60.0
	Milligan	4	13.3
	Other	<u>8</u>	<u>26.7</u>
	Total	30	100.0

Table 2 indicates that the majority of the third-grade teachers' college major and teacher certification was in Elementary Education, 70.0% and 83.3% respectively. One teacher obtained National Board Certification. Over one half (53.3%) of the teachers had a master's degree or above, while 46.7% of the teachers had a bachelor's degree. Sixty percent of the teachers received their teaching degree at East Tennessee State University, and 13.3% of the teachers received their teaching degree at Milligan College, both in Johnson City, Tennessee. Approximately 26.7% of the teachers received their degree from one of the following institutions: (a) Penn State, (b) University of Central Florida, (c) Tennessee State University, (d) University of Tennessee, (e) Stetson, (f) Armstrong State and (g) Virginia Intermont College.

Table 3 represents multiple responses obtained from Question 7 (Appendix C) on the survey from teachers. There were 50 responses; the column labeled percent of responses is simply the number of responses (count) divided by the total number of responses. Six teachers had not taught any grades except third-grade. Therefore, the percent of cases column is based on the 24 teachers who had taught a grade in addition to third. As shown in Table 4, the third-grade teachers had the least experience in teaching kindergarten (8.3%), and had the most experience in teaching first and second grade (54.2%). Nine teachers had experience in teaching fourth grade, and seven teachers had experience in teaching fifth grade. About 25% of the teachers had other teaching experiences, such as: (a) secondary, (b) special education, (c) Title I Reading, and (d) Head Start.

Table 3

*Additional Grades Taught*

	Count	% of Responses	% of Cases
Kindergarten	2	4	8.3
First Grade	13	26	54.2
Second Grade	13	26	54.2
Fourth Grade	9	18	37.5
Fifth Grade	7	14	29.2
Other Grades	6	12	25.0
Total Responses	50	100	

*Research Question 2*

Are there any differences in DAP levels as measured by the APEEC among teacher characteristics, such as teacher certification, college major, highest degree earned, years of experience, knowledge of DAP, and degree granting institution? From research question 2, nine statistical hypotheses were developed and eight were analyzed. Because only one teacher in the sample had early childhood certification in the distribution of teacher certification, the differences of APEEC scores between the teachers with early childhood certification and the teachers with other types of certification were not addressed. Therefore, no analysis was conducted on null hypotheses one: Ho2<sub>1</sub>: There are no differences between teacher certification and teachers' use of DAP practices.

From research question 2, nine null hypotheses were developed and analyzed.

Ho2<sub>2</sub>: There are no differences between teacher college major and teachers' use of DAP practices.

Ho2<sub>3</sub>: There are no differences between teacher highest degree type and teachers' use of DAP practices.

Ho2<sub>4</sub>: There are no relationships between teacher years of experience and teachers' use of DAP practices.

Ho2<sub>5</sub>: There are no differences among teachers with varying levels of knowledge and their physical environment DAP practices.

Ho2<sub>6</sub>: There are no differences among teachers with varying levels of knowledge and their instructional DAP practices.

Ho2<sub>7</sub>: There are no differences among teachers with varying levels of knowledge and their social context DAP practices.

Ho2<sub>8</sub>: There are no differences among teachers with varying levels of knowledge and their total DAP practices.

Ho2<sub>9</sub>: There are no differences between teacher degree granting institution and teachers' use of DAP in the classroom.

An independent-samples t test was conducted to evaluate whether the mean scores of the APEEC differed between teachers' college majors (early childhood) and other majors (elementary, secondary, special education, etc.). The APEEC scores (physical environment, instructional context, social context, and total DAP) were the independent variable and the grouping variable was early childhood degree or other degree. Each of the APEEC measures had a potential score range of 1 to 7, including the total score.

Each teacher received a total APEEC score by calculating the sum of the items that made up the measures, divided by the number of items. Therefore, on the 7-point continuum, higher scores were intended to reflect more developmentally appropriate practices. The tests were not significant at any of the DAP levels,  $t(28) = 1.12, p = .27$ ,  $t(28) = .26, p = .80$ ,  $t(28) = 1.22, p = .23$ , and  $t(28) = .76, p = .45$ , respectively. The effect sizes, as measured by  $\eta^2$ , for college majors in physical environment (.04), instructional context (.002), social context (.05), and total (.02), indicated a small effect size. As a result of this analysis, the null hypothesis  $H_{02}$  was retained. However, Table 4 shows that the mean APEEC score for early childhood college majors was higher for all three domains as well as for the total score. In fact, there was close to a .6 point total score mean difference between the teachers with early childhood degrees and other degrees. Regarding the social context of the classroom, the early childhood degree teachers scored higher with a mean difference of .75.

Table 4

*Mean Comparisons for the DAP Measures by College Major*

DAP	Major in College	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	$\eta^2$	<i>p</i>
Physical Environment	Early Childhood	4	5.19	1.16	28	1.12	.04	.27
	Other Major	26	4.40	1.31				
Instructional Context	Early Childhood	4	4.54	1.72	28	.26	<.01	.80
	Other Major	26	4.28	1.89				
Social Context	Early Childhood	4	5.20	.91	28	1.22	.05	.23
	Other Major	26	4.45	1.17				
Total DAP Score	Early Childhood	4	4.93	1.24	28	.76	.02	.45
	Other Major	26	4.37	1.40				

An independent-samples t test was conducted to evaluate the hypothesis that teachers with higher degrees, such as a masters' or doctorate, would have higher DAP scores than teachers with only a bachelor's degree. The test was not significant for the physical environment, instructional context, social context, or total DAP levels,  $t(28) = .80, p = .43, t(28) = .14, p = .89, t(28) = .08, p = .94, t(28) = .30, p = .77$ , respectively; consequently, the results were counter to the research hypothesis. Therefore, the null hypothesis  $H_{023}$  was retained. The effect sizes, measured by  $\eta^2$ , for each domain were .01 .03, .02, and .02, respectively, which indicated a very small effect size. Table 5 shows the distributions for the two groups.

Table 5

*Mean Comparisons for APEEC Scores by Highest Degree Earned*

DAP	Highest Degree	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	$\eta^2$	<i>p</i>
Physical Environment	Bachelor's	14	4.71	1.38	28	.80	.01	.43
	Master's or higher	16	4.33	1.25				
Instructional Context*	Bachelor's	14	4.37	2.15	28	.14	.03	.89
	Master's or higher	16	4.27	1.60				
Social Context	Bachelor's	14	4.57	1.26	28	.08	.02	.94
	Master's or higher	16	4.54	1.10				
Total DAP Score	Bachelor's	14	4.53	1.58	28	.30	.02	.77
	Master's or higher	16	4.37	1.21				

\* t test does not assume equal variances

Correlation coefficients were computed to evaluate the relationship among the total number years teaching experience and the four APEEC measures. Based on the analyses, there was no relationship between the total years taught with any of the APEEC measures: physical environment ( $r = -.001$ ), instructional context ( $r = -.045$ ), social context ( $r = -.022$ ), and total APEEC score ( $r = -.031$ ). The null hypothesis  $H_{024}$  was retained and the results indicated that the different levels of DAP scores with total DAP scores were not significantly affected by either a low number of years teaching experience or a high number of years teaching experience. Table 6 shows the correlations among all the total years of teaching experience and the APEEC measures.

Table 6

*Pearson Correlations for Teacher Total Years of Experience with DAP Measures*

	Total Years Taught
Physical Environment	-.001
Instructional Context	-.045
Social Context	-.022
Total DAP Score	-.031

One-way analysis of variance (ANOVA) was used to determine if there were differences in teachers' knowledge of DAP and their DAP practices in the classroom. For this analysis, teachers were asked to rate their knowledge of developmentally appropriate practices on a scale of 1 to 5, with 1 indicating little or no knowledge and 5 indicating a great deal of knowledge. The distribution of this variable is shown in Table 7.

Table 7

*Frequency Distribution of Teacher Self-Reported Knowledge of DAP*

Knowledge of DAP	f	%
1	1	3.3
2	1	3.3
3	5	16.7
4	10	33.3
5	<u>13</u>	<u>43.3</u>
Total	30	100.0

Because the distribution of this variable was skewed, knowledge of developmentally appropriate practices was grouped into three categories, representing: little knowledge to moderate knowledge ( $n = 7$ ); quite a lot of knowledge ( $n = 10$ ); and a great deal of knowledge ( $n = 13$ ). The independent variable was the teachers' knowledge level of DAP. The dependent variable was the APEEC physical environment measure. Figure 1 shows the APEEC physical environment score distributions of the three groups.

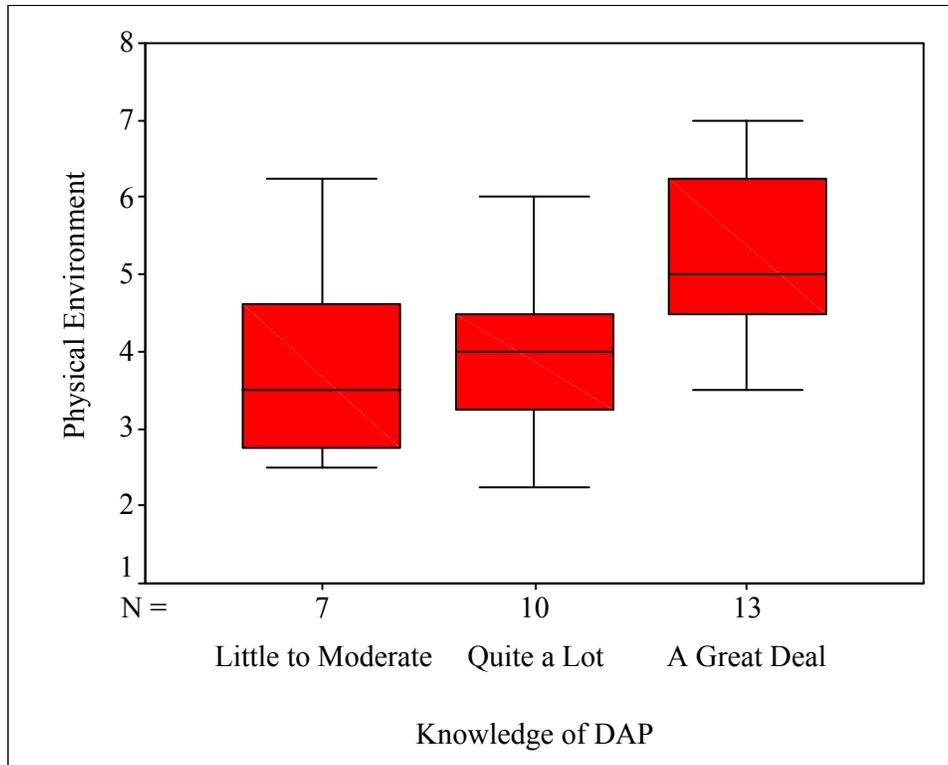


Figure 1. Distribution of Physical Environment Scores for Knowledge of DAP Groups

The ANOVA was significant,  $F(2, 27) = 4.39, p = .02$ , and the null hypothesis  $H_0$  was rejected. The effect size for teacher knowledge of DAP, as assessed by eta square, was large (.25). Because the overall  $F$  test was significant, post hoc multiple comparisons were used to determine pairwise differences among the means of the three groups. A Tukey procedure was selected for the pairwise comparisons because the group variances were assumed,  $F(2, 27) = .56, p = .58$ . There was no difference in the means of teachers with little to moderate knowledge and teachers with quite a lot knowledge ( $p = .96$ ). There was a significant difference between teachers with little to moderate knowledge and teachers with a great deal of knowledge ( $p = .05$ ). The mean for teachers with a great deal of knowledge was higher than the mean for teachers with little to

moderate knowledge. There was a significant difference between the means of teachers with quite a lot of knowledge and teachers with a great deal of knowledge. Teachers with a great deal of knowledge had a higher mean than teachers with quite a lot of knowledge. It appeared that having a great deal of knowledge about developmentally appropriate practices increased the likelihood of incorporating a DAP classroom environment. The 95% confidence intervals for the pairwise differences are reported in Table 8.

Table 8

*Physical Environment APEEC Means and Standard Deviations with 95% Confidence Intervals of Pairwise Comparisons of Knowledge of DAP Levels*

Knowledge of DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>	Little to Moderate	Quite a Lot
Little to Moderate	7	3.86	1.38		
Quite a Lot	10	4.02	1.08	-1.60 to 1.27	
A Great Deal	13	5.23	1.13	-2.74 to -.01	-2.43 to .02

One-way analysis of variance was used to evaluate the association between teacher knowledge level of DAP and the APEEC instructional context in the classroom. The independent variable, knowledge of DAP, had three levels: little to moderate knowledge, quite a lot of knowledge, and a great deal of knowledge. The dependent variable was the APEEC instructional context score. Figure 2 shows the APEEC instructional context score distributions of the three groups.

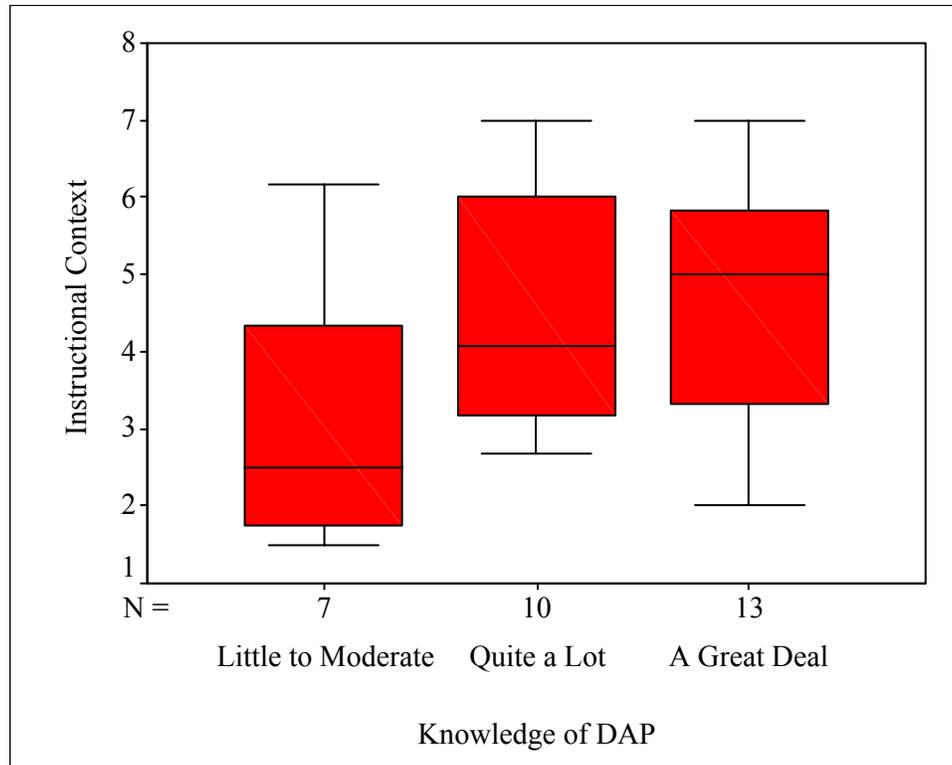


Figure 2. Distribution of Instructional Context Scores for Knowledge of DAP Groups

The ANOVA was not significant,  $F(2,27) = 1.82, p = .18$ , and the null hypothesis  $H_{06}$  was retained. Although not significant, it was important to note that 12% of the variance in the instructional context was explained by the three levels of knowledge of DAP ( $R^2 = .12$ ). The results indicated that the teacher knowledge of DAP was not significantly affected by teacher's instructional practices in the classroom. The means and standard deviations for the three groups are reported in Table 9.

Table 9

*Mean Comparisons for Instructional Context by Teacher Knowledge of DAP*

Knowledge Level	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Little to Moderate	7	3.19	1.98	2, 27	1.8	.12	.18
Quite a Lot	10	4.57	1.63				
A Great Deal	13	4.73	1.82				
Instructional Context Total	30	4.32	1.84				

One-way analysis of variance was used to evaluate the association between teacher knowledge level of DAP and the APEEC social context in the classroom. The independent variable, knowledge of DAP, had three levels: little to moderate knowledge, quite a lot of knowledge, and a great deal of knowledge. The dependent variable was the APEEC social context score. Figure 3 shows the APEEC social context score distributions of the three groups.

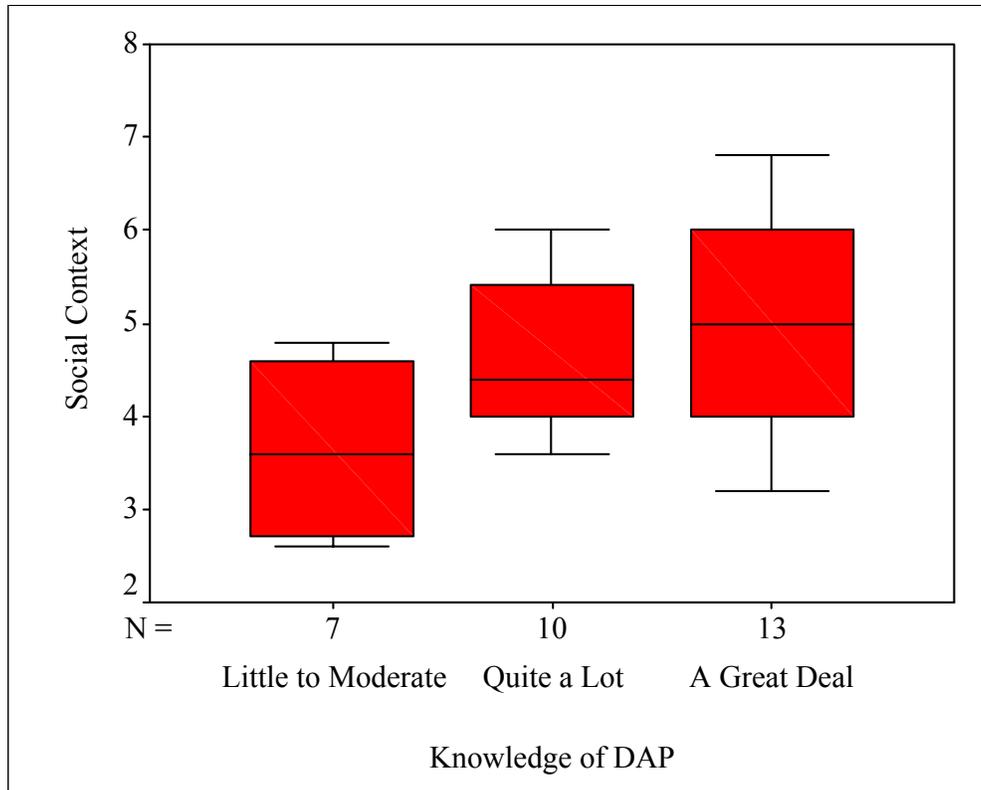


Figure 3. Distribution of Social Context Scores for Knowledge of DAP Groups

The ANOVA was significant,  $F(2,27) = 3.50, p = .04$ , and the null hypothesis  $H_{027}$  was rejected. The strength of the relationship between the teachers' DAP knowledge level and social context, as assessed by  $\eta^2$ , was large (.21). Because the overall  $F$  test was significant, post hoc multiple comparisons were used to determine pairwise differences among the means of the three groups. A Tukey procedure was selected for the pairwise comparisons because the group variances were assumed,  $F(2, 27) = 1.86, p = .17$ . There was no difference in the means between teachers with little to moderate knowledge and teachers with quite a lot of knowledge ( $p = .17$ ). There was no difference in the means of teachers with quite a lot of knowledge and a great deal of knowledge ( $p = .75$ ). There was a significant difference in the means of teachers with

little to moderate knowledge and teachers with a great deal of knowledge ( $p = .04$ ). It appeared that having a great deal of DAP knowledge was effective in creating a DAP social context in the classroom. The 95% confidence intervals for the pairwise differences, as well as, the means and standard deviations for the three knowledge level groups, are reported in Table 10.

Table 10

*Social Context Means and Standard Deviations with 95% Confidence Intervals of Pairwise Differences among Knowledge of DAP Levels*

Knowledge of DAP	N	M	SD	Little to Moderate	Quite a Lot
Little to Moderate	7	3.66	1.01		
Quite a Lot	10	4.64	.79	-2.28 to .32	
A Great Deal	13	4.97	1.25	-2.55 to -.07	-1.44 to .78

One-way analysis of variance was used to evaluate the association between teacher knowledge level of DAP and the total APEEC score. The independent variable, knowledge of DAP, had three levels: little to moderate knowledge, quite a lot of knowledge, and a great deal of knowledge. The dependent variable was the total APEEC score. Figure 4 shows the total APEEC score distributions of the three groups.

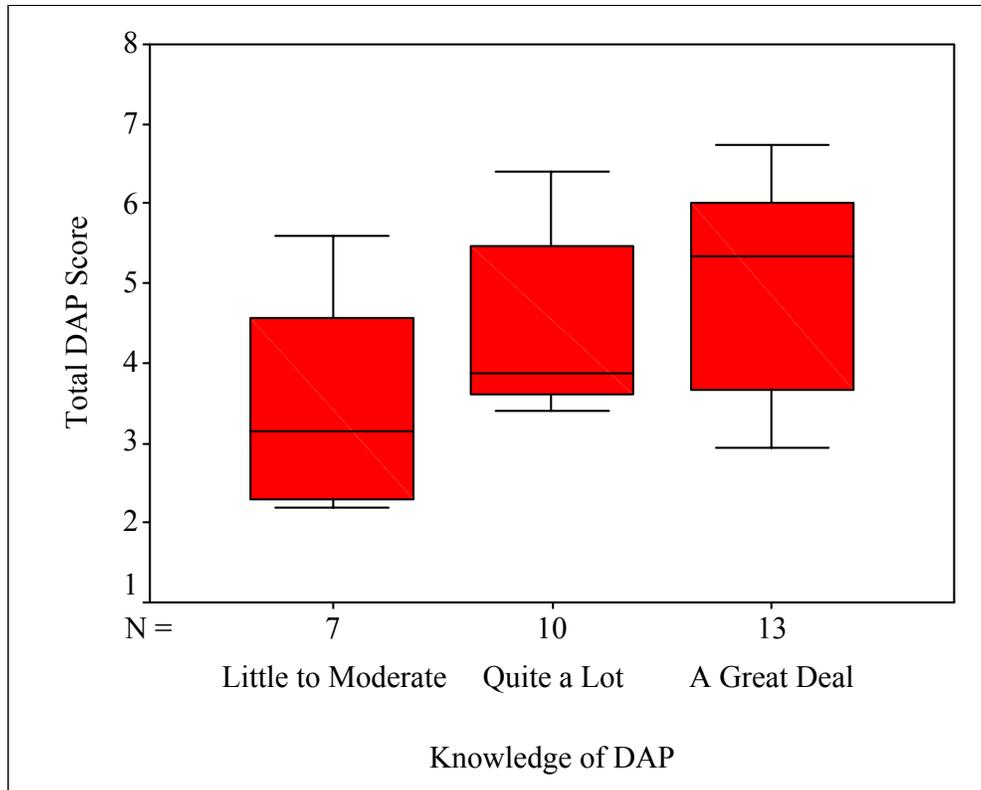


Figure 4. Distribution of Total APEEC Scores for Knowledge of DAP Groups

The ANOVA was not significant,  $F(2,27) = 2.74, p = .08$ , and the null hypothesis  $H_{028}$  was retained. Although not significant, it was important to note that 17% of the variance in the total DAP scores was accounted for by the three levels of knowledge of DAP ( $R^2 = .17$ ). Table 11 shows what seems to be a substantively important difference between the means. In fact, there was a .93 mean difference between teachers knowing little to moderate to quite a lot about DAP, and a .49 mean difference between teachers knowing quite a lot to a great deal about DAP. More importantly, the mean difference between teachers that understood DAP little to moderate levels and teachers that understood DAP a great deal was 1.42.

Table 11

*Mean Comparisons for Total DAP by the Levels of Knowledge of DAP*

Knowledge Level	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Little to Moderate	7	3.52	1.45	2, 27	2.74	.17	.08
Quite a Lot	10	4.45	1.09				
A Great Deal	13	4.94	1.35				
Total DAP Score	30	4.45	1.37				

In comparing whether any differences existed between teacher degree granting institutions and teachers' use of DAP in the classrooms, an independent samples t-test was used to test Ho<sub>29</sub>. The null hypothesis Ho<sub>29</sub> was retained. As shown in Table 12, there were no statistical differences between the total APEEC score and the degree granting institutions,  $t(28) = .80, p = .43$ . The eta square index was .02, which indicated a small effect size. However, it should be noted that the teachers who graduated from a local institution (East Tennessee State University and/or Milligan College) had higher means in all APEEC domains than the teachers who graduated from a non-local institution. (See page 80 for the list of non-local institutions.)

Table 12

*Mean Comparisons for DAP Measures by Type of Degree Granting Institution*

	Degree Granting Institution	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	$\eta^2$	<i>p</i>
Physical Environment	Local	24	4.57	1.37	28	.54	.01	.60
	Other	6	4.25	1.07				
Instructional Context	Local	24	4.47	1.88	28	.88	.03	.39
	Other	6	3.72	1.72				
Social Context	Local	24	4.63	1.12	28	.68	.02	.51
	Other	6	4.27	1.33				
Total DAP Score	Local	24	4.55	1.42	28	.80	.02	.43
	Other	6	4.04	1.18				

*Research Question 3*

Is there an association between third-grade teachers' use of DAP as measured by the APEEC and students' achievement on standardized tests as measured by the TCAP/CRT? Because research question 3 is the primary focus of the dissertation, the investigation concentrated on whether there were differences in achievement scores among teachers with excellent DAP scores and teachers with less than excellent DAP scores. The DAP score for practices related to the physical environment, instructional context, social context and the total score were the averages of the items in each practice.

For the analysis of this research question, these means were collapsed into three categories, representing the following levels: inadequate to minimal, good, and excellent. All DAP scores were on a 7-point scale. DAP scores less than 4 were considered inadequate to minimal. DAP scores between 4.0 and 5.9 were considered good, while scores 6 and above were considered excellent. The percentage of teachers in each DAP level is shown in Table 13.

Table 13

*Percent of Teachers at Each DAP Level*

APEEC Domain		<i>n</i>	%
Physical Environment:	Inadequate to Minimal	9	30
	Good	15	50
	Excellent	<u>6</u>	<u>20</u>
	Total	30	100.0
Instructional Context:	Inadequate to Minimal	15	50
	Good	8	26.7
	Excellent	<u>7</u>	<u>23.3</u>
	Total	30	100.0
Social Context:	Inadequate to Minimal	8	26.7
	Good	17	56.7
	Excellent	<u>5</u>	<u>16.7</u>
	Total	30	100.0
Total APEEC:	Inadequate to Minimal	15	50
	Good	10	33.3
	Excellent	<u>5</u>	<u>16.7</u>
	Total	30	100.0

From research question 3, eight null hypotheses were developed and analyzed.

Ho3<sub>1</sub>: There is no association between the classroom physical environment score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>2</sub>: There is no association between the classroom physical environment score and student achievement CRT/TCAP scores in Math.

Ho3<sub>3</sub>: There is no association between specific instructional context score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>4</sub>: There is no association between specific instructional context score and student achievement CRT/TCAP scores in Math.

Ho3<sub>5</sub>: There is no association between the classrooms' social context score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>6</sub>: There is no association between the classrooms' social context score and student achievement CRT/TCAP scores in Math.

Ho3<sub>7</sub>: There is no association between the classrooms' overall APEEC score and student achievement CRT/TCAP scores in Reading/Language.

Ho3<sub>8</sub>: There is no association between the classrooms' overall APEEC score and student achievement CRT/TCAP scores in Math.

A one-way analysis of variance was conducted to evaluate the association between the classroom physical environment score and student achievement CRT/TCAP scores in Reading/Language. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Reading/Language Arts. The ANOVA was not significant,  $F(2,26) = .43$ ,  $p = .65$ , and the null hypothesis Ho3<sub>1</sub> was retained. The effect

size, as measured by  $\eta^2$ , was small (.03). Although the mean scale scores were higher among teachers at the excellent DAP level, the results indicated that the CRT scale scores were not significantly affected by the classrooms' physical environment. The means and standard deviations for the three DAP levels are reported in Table 14.

Table 14

*Reading Means and Standard Deviations of DAP Physical Environment*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	8	488.99	7.19
Good	15	491.10	7.40
Excellent	6	492.30	4.51

A one-way analysis of variance was conducted to evaluate the association between the classroom physical environment score and student achievement CRT/TCAP scores in Math. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Math. The ANOVA was not significant,  $F(2,27) = .90, p = .42$ , and the null hypothesis  $H_{03_2}$  was retained. The effect size, as measured by  $\eta^2$ , was medium (.06). The results indicated that the CRT math scale scores were not significantly affected by the classrooms' physical environment. The means and standard deviations for the three DAP levels are reported in Table 15.

Table 15

*Math Means and Standard Deviations of DAP Physical Environment Teacher Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	9	476.84	10.28
Good	15	481.41	8.06
Excellent	6	476.91	10.73

A one-way analysis of variance was conducted to evaluate the association between the classroom instructional context score and student achievement CRT/TCAP scores in Reading/Language. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Reading/Language Arts. The ANOVA was significant,  $F(2, 26) = 10.09, p = .001$ . The effect size, as measured by  $\eta^2$ , was large (.44). As a result of this analysis, the null hypothesis  $H_{03}$  was rejected.

Because the overall  $F$  test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the three levels. A Tukey procedure was selected for the multiple comparisons because equal variances were assumed ( $F(2, 26) = .81, p = .46$ ). There was a significant difference in the means between the inadequate to minimal and excellent DAP level ( $p = .001$ ) and the good to excellent DAP level ( $p = .002$ ). However, there was not a significant difference between the inadequate to minimal and good DAP level ( $p = .95$ ). Figure 5 shows the DAP levels

of the three groups. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the three DAP levels, are reported in Table 16.

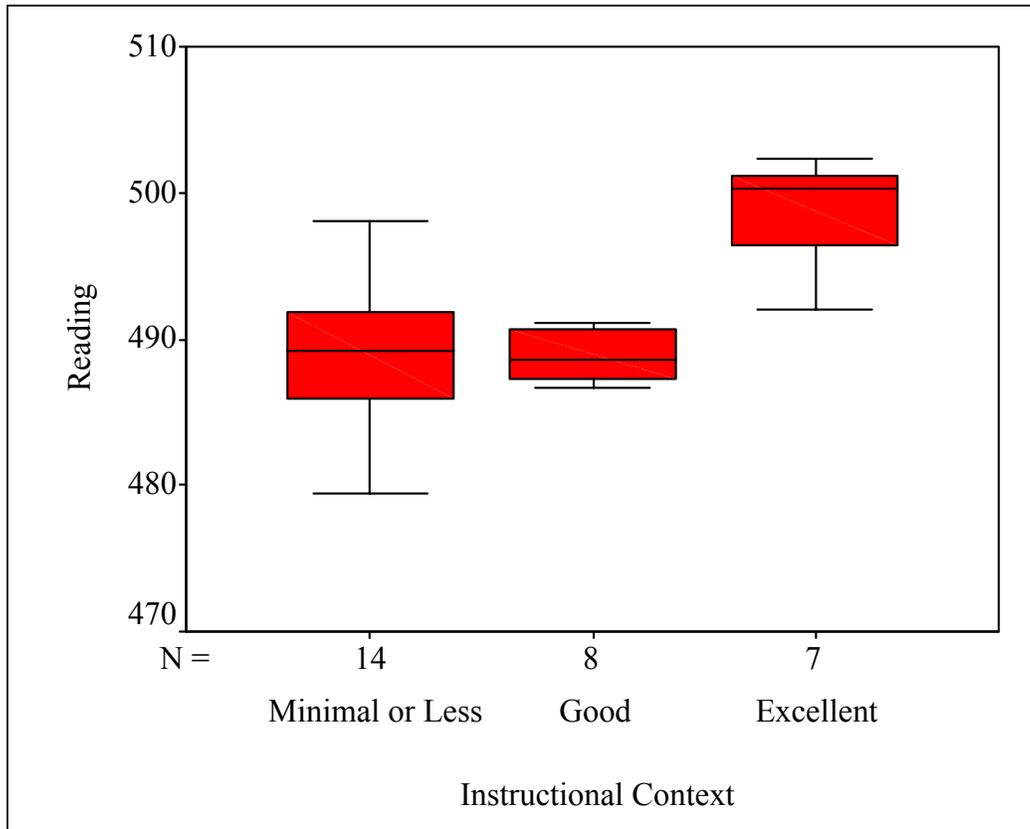


Figure 5. DAP Levels of the Three Groups in Reading/Language

Table 16

*Reading/Language Means and Standard Deviations of DAP Instructional Teacher Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>	Good	Excellent
Inadequate to minimal	14	488.56	6.21	-5.07 to 6.49	-15.99 to -3.91
Good	8	487.85	4.06		-17.41 to -3.91
Excellent	7	498.51	4.08		

As shown in Table 16, teachers at the excellent DAP level had a mean score of 498.51, which, according to the *No Child Left Behind Law*, was considered Advanced Proficiency. Teachers in the inadequate to minimal and good DAP level, on average, received only proficient achievement. Table 17 shows third-grade scale score ranges in Advanced, Proficient, and Below Proficient for CRT Reading/Language Arts.

Table 17

*Reading/Language Scale Score Range for Advanced, Proficient, and Below Proficient*

NCLB Levels	Scale Score Range
Advanced:	496-640
Proficient:	455-495
Below Proficient:	315-454

A one-way analysis of variance was conducted to evaluate the association between the classroom instructional context score and student achievement CRT/TCAP scores in Math. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Math. The ANOVA was not significant,  $F(2,27) = 2.53, p = .10$ , and the null hypothesis  $H_{034}$  was retained. However, it was worthy to note that the effect size, as measured by  $\eta^2$ , was large (.16). As indicated in Table 18, there was a mean difference of 9.42 between the good and excellent DAP level. This substantially important finding, again, placed the mean of the excellent level teachers at Advanced

Proficiency. Table 19 shows third-grade scale score ranges in Advanced, Proficient, and Below Proficient for CRT Mathematics.

Table 18

*Math Means and Standard Deviations of DAP Instructional Context Teacher Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	15	477.70	8.32
Good	8	476.18	5.58
Excellent	7	485.59	12.29

Table 19

*Math Scale Score Range for Advanced, Proficient, and Below Proficient*

NCLB Levels	Scale Score Range
Advanced:	484-630
Proficient:	448-483
Below Proficient:	310-447

A one-way analysis of variance was conducted to evaluate the association between the classroom social environment score and student achievement CRT/TCAP scores in Reading/Language. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers'

class average CRT scale score in Reading/Language Arts. The ANOVA was not significant,  $F(2,26) = 1.34, p = .30$ , and the null hypothesis  $H_{035}$  was retained. The effect size, as measured by  $\eta^2$ , was medium (.09). Although the mean scale scores were higher among teachers at the excellent DAP level, the results indicated that the CRT scale scores were not significantly affected by the classrooms' social environment. The means and standard deviations for the three DAP levels are reported in Table 20.

Table 20

*Reading Means and Standard Deviations of DAP Social Context Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	7	489.83	7.75
Good	17	489.85	6.72
Excellent	5	495.21	4.16

A one-way analysis of variance was conducted to evaluate the association between the classroom social context score and student achievement CRT/TCAP scores in Math. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Math. The ANOVA was not significant,  $F(2,27) = .93, p = .41$  and the null hypothesis  $H_{036}$  was retained. The effect size, as measured by  $\eta^2$ , was medium (.06). Although a 5.63 mean difference between inadequate to minimal and excellent DAP levels existed, the results indicated that the CRT math scale scores were not significantly

affected by the social context. The means and standard deviations for the three DAP levels are reported in Table 21.

Table 21

*Math Means and Standard Deviations of DAP Social Context Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	8	475.31	9.32
Good	17	480.41	9.24
Excellent	5	480.94	9.34

A one-way analysis of variance was conducted to evaluate the association between the classroom total DAP score and student achievement CRT/TCAP scores in Reading/Language. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Reading/Language Arts. The ANOVA was not significant,  $F(2,26) = 1.72, p = .20$ , and the null hypothesis  $H_{037}$  was retained. The effect size, as measured by  $\eta^2$ , was medium (.12). Although the mean scale score was 5.76 points higher between teachers at the inadequate to minimal and the excellent DAP level, the results indicated that the CRT scale scores were not significantly affected by the classrooms' total DAP score. The means and standard deviations for the three DAP levels are reported in Table 22.

Table 22

*Reading/Language Means and Standard Deviations of DAP Total APEEC Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	14	488.56	6.21
Good	10	492.08	7.47
Excellent	5	494.32	5.50

A one-way analysis of variance was conducted to evaluate the association between the classroom total APEEC score and student achievement CRT/TCAP scores in Math. The independent variable included three levels of DAP: inadequate to minimal, good, and excellent. The dependent variable was the teachers' class average CRT scale score in Math. The ANOVA was not significant,  $F(2,27) = .712, p = .50$ , and the null hypothesis  $H_{038}$  was retained. The effect size, as measured by  $\eta^2$ , was small to moderate (.06). The results indicated that the CRT math scale scores were not significantly affected by the total APEEC scores. The means and standard deviations for the three DAP levels are reported in Table 23.

Table 23

*Math Means and Standard Deviations of DAP Total APEEC Teacher Levels*

DAP Level	<i>n</i>	<i>M</i>	<i>SD</i>
Inadequate to minimal	15	477.70	8.32
Good	10	482.01	9.59
Excellent	5	477.69	12.10

*Summary*

Chapter 4 provided an analysis of the data, and Chapter 5 includes implications, conclusions, and recommendations for further consideration.

## CHAPTER 5

### FINDINGS, DISCUSSIONS, AND RECOMMENDATIONS

The primary goal of this study was to determine if there were differences in classroom scale *CRT* achievement scores among teachers implementing developmentally appropriate practices at the excellent, good, and minimal to inadequate level in selected Upper East Tennessee third-grade classrooms. The focus of the analysis was on two academic content areas of the third-grade TN *Terra Nova* standardized achievement test. These content areas included Reading/Language Arts and Mathematics with an emphasis on how students performed in each reporting category.

The study also examined teacher characteristics, including type of degree, highest degree, years of experience, and degree granting institution to determine if there was an association between these characteristics that seemed to influence developmentally appropriate practices. The teacher questionnaire surveyed demographic information, knowledge level of DAP, and a question regarding the federal *No Child Left Behind* mandate. Primarily incorporating a multiple-choice format, the questionnaire also contained one open-ended and three short-answer questions. Teachers were asked to complete the survey during the time of the observation. All observations took place in the spring of 2005, prior to the *Terra Nova* testing.

Five school districts, including two county systems and three city systems, agreed to participate in the study. Thirty third-grade teachers participated in the study. Each teacher was observed during math and reading instruction. Inter-rater reliability was

established initially and again during the middle and final observations by a second observer.

The findings of the study were analyzed using the Statistical Package for the Social Sciences (SPSS) software program, which is a powerful and easy-to-use data analysis package for the social sciences (Green, & Salkind, 2004). For research question 1, an initial analysis of data incorporated simple descriptive statistics in the form of frequency tables. Independent-samples *t* tests, Pearson product-moment correlation coefficient, and analyses of variances (ANOVAs) were used to analyze research question 2, which investigated teacher characteristics and the relationship of DAP. Research question 3 specifically investigated whether or not there were differences in achievement scores between teachers with excellent DAP scores and teachers with less than excellent DAP scores. Therefore, teacher *APEEC* scores were grouped into three levels: inadequate to minimal, good, and excellent. Finally, a one-way-analysis of variance was used to assess if there were differences among these DAP levels and classroom teacher achievement scores.

### *Findings*

#### *Research Question #1*

What is the demographic profile of the third-grade teachers?

Thirty third-grade teachers in Upper East Tennessee completed the demographic survey. All teachers were considered highly qualified. Chapter 2 indicated that a highly qualified teacher with a caring attitude was the most critical element in a quality early childhood classroom (Isbell, & Exelby, 2001). Frequency distributions indicated that a

majority (83.3%) of the teachers held an elementary education certification, with only (3.3%) holding an early childhood teacher certification. One teacher had achieved National Board Certification. Fourteen of the teachers had bachelor's degrees and 16 of the teachers had master's degrees or above. Sixty percent of the teachers received their degrees from East Tennessee State University. Nearly thirteen percent of the teachers received their degrees from Milligan College, while the remaining (26.7%) received their degrees from other colleges. Third-grade teachers had the least experience in teaching kindergarten (8.3%), and had the most experience in teaching first and second grade (54.2%). Nine teachers had experience in teaching fourth grade, and seven teachers had experience in teaching fifth grade. Buchanan *et al.* (1998) noted that teachers who were only certified in elementary education were significantly more likely to be teaching in primary grades than teachers who were also certified in early childhood. Teachers certified in early childhood were significantly more likely to be teaching kindergarten or first grade than second or third-grade (Buchanan *et al.*).

The teachers were asked if the current law, *NCLB*, had changed their third-grade teaching practices. Over half of the teachers agreed that *NCLB* had changed their teaching practices. The following statements were made from teachers that indicated *NCLB* had changed the way they taught:

Teacher 5:

*“With the pressure to teach so many skills and cover all materials by TCAP time in mid-April, there is very little time to do creative and ‘fun’ things with the class.”*

Teacher 7:

*“There is less time for character education – Life Skills. Also, there is less opportunity for ‘teachable moments’. My blueprint of learning standards are strictly followed and enforced. DAPs are compromised.”*

Teacher 8:

*“It has reduced the fun projects done in class. I do not believe a law can change the way a student learns.”*

Teacher 11:

*“More skills-based focus, less opportunity for creative activities.”*

Teacher 17:

*“More pressure is on [the] teacher to cover more skills so that test scores will hopefully be good.”*

Teacher 21:

*“I am more concerned about test scores than ever before. It is important to reach AYP goals.”*

Teacher 27:

*“We teach to the test.”*

Teacher 30:

*“Value added scores are greatly stressed. Therefore we practice taking standardized tests more and spend more time reviewing before tests are given.”*

### *Research Question #2*

Are there any differences in DAP levels as measured by the APEEC among teacher characteristics, such as teacher certification, college major, highest degree earned, years of experience, knowledge of DAP, and degree granting institution?

Independent-sample *t* tests were conducted to evaluate whether the mean scores of the APEEC differed from teachers’ college degrees (early childhood major) and other

majors (elementary, secondary, special education, etc.). The tests were not significant at all four DAP domains. However, the mean APEEC scores for early childhood college majors were higher in physical environment, instructional context, social context, and the total APEEC score. It was important to note that the small sample size could have been a factor in this particular analysis. The literature review suggested that teachers with high DAP scores tended to have early childhood or child development education at some point in their teaching careers (McMullen, 1999).

An independent-samples t test was conducted to evaluate the hypothesis that teachers with higher degrees, such as a masters' or doctorate degrees, would have higher DAP scores than teachers with a bachelor's degree. The test was not significant for the physical environment, instructional context, social context, or total DAP levels, and the results were counter to the research presented in Chapter 2. For example, Maxwell *et al.* (2001) found that classrooms taught by teachers with a master's degree were observed to be more developmentally appropriate than those taught by teachers with less education.

Correlation coefficients were computed to evaluate the relationship among the total number of years of teaching experience and the four APEEC domains. Based on the analyses, there was no relationship between the total years taught with any of the APEEC domains. The results indicated that the different DAP domains were not significantly affected by either low number of years teaching experience or high number of years teaching experience. This finding was congruent with the Maxwell (2001) study, which found no relationship between teacher years of experience and developmentally appropriate practices. Many factors could contribute to the lack of relationship between years of experience and DAP. As teachers gained additional experience, they might

become more knowledgeable of how children developed, thus, incorporating more DAP in their classroom. On the other hand, novice teachers could exhibit more DAP in their classrooms merely because their college program incorporated the DAP philosophy.

One-way analysis of variance (ANOVA) was used to determine if there were differences in teachers' knowledge of DAP and their DAP practices in the classroom. The variables tested were physical environment, instructional context, social context, and the total APEEC. The ANOVA was significant in the physical environment and social context, both having large effect sizes. Surprisingly, the ANOVA was not significant in instructional context or the total APEEC. Chapter 4 noted that 17% of the variance in the total DAP scores was accounted for by the three levels of knowledge of DAP, which was substantial. Isenberg (1990) indicated that teacher judgments were directly influenced by knowledge and beliefs, which consequentially determined classroom instruction. The literature review presented a noteworthy finding, indicating that the more strongly teachers believed in developmentally appropriate practices, the more likely they were to implement those practices in their classrooms (Dunn, & Kontos, 1997).

An independent samples t-test was used to determine if there were differences between teacher degree granting institution and teachers' use of DAP in the classroom. There were no statistical differences between the total APEEC score and the degree granting institutions. However, it should be noted that the teachers who graduated from a local institution (East Tennessee State University and/or Milligan College) had higher means in all APEEC domains than the teachers who graduated from other institutions.

### *Research Question #3*

Is there an association between third-grade teachers' use of DAP as measured by the APEEC and students' achievement on standardized tests as measured by the TCAP/CRT?

For the analysis of this research question, APEEC means were collapsed into three categories, representing the following levels: inadequate to minimal, good, and excellent. Of the 30 teachers observed, twenty percent were considered excellent in the physical environment. Twenty-three percent of the teachers were considered excellent in the instructional context, while 16.7% of the teachers were considered excellent in the social context. Overall, 16.7% of the teachers were considered excellent in the total APEEC score. Approximately half of the teachers were considered inadequate to minimal in the instructional context and total APEEC. Research in the literature review reported that very few early childhood education classrooms exemplified developmentally appropriate practice (Burts *et al.*, 1993; Huffman, & Speer, 2000). More specifically, Dunn and Kontos (1997) found that only about one fifth to one third of the early childhood classrooms fully demonstrated developmentally appropriate practice. Marcon (2002) and Buchanan *et al.* (1998) found that developmentally appropriate practice was more commonly implemented in lower grades than in primary grades.

A one-way analysis of variance was conducted to evaluate the relationship between the classroom physical environment score and student achievement CRT/TCAP scores in Reading/Language and Mathematics. The ANOVAs were not significant. Importantly, mean scale scores were higher in Reading/Language among teachers at the excellent DAP level. The small sample size and the limited number of APEEC physical

environment items (only 4 items) could have been a contributing factor to this finding. The research literature in Chapter 2 suggested that, as teachers gained a greater understanding of child development and their students' levels of development, they could create and design the environment that best met their students' needs (Isbell, & Exelby, 2001). Goldstein (1997) aptly commented, "Opening the classroom door should be as exciting as opening a gift package" (p. 8).

A one-way analysis of variance was conducted to evaluate the relationship between the classroom instructional context score and student achievement CRT/TCAP scores in Reading/Language and Mathematics. The ANOVA was significant in Reading/Language with a large effect size (.44). There was a significant difference in the means between the inadequate to minimal and excellent DAP level and the good to excellent DAP level. There was not a significant difference between the inadequate to minimal and good DAP level. Notably, the teachers performing at the excellent DAP levels achieved Advanced Proficiency under the *No Child Left Behind* standards. Teachers in the inadequate to minimal and good DAP level, on average, only received proficient achievement. These findings suggested that teachers who were engaging in high levels of the instructional context items obtained impressive achievement results.

Ironically, the ANOVA was not significant in Mathematics, but the effect size was large (.16). This substantially important finding, again, placed the mean of the excellent level teachers at Advanced Proficiency. Bredekamp and Copple (1997) maintained that teachers needed to understand that merely manipulating objects did not automatically improve children's understanding of mathematical concepts. It was the

combination of active learning with the use of hands-on materials and skilled teaching based on a relevant, engaging, and intellectually challenging curriculum.

A one-way analysis of variance was conducted to evaluate the relationship between the classroom social environment score and student achievement CRT/TCAP scores in Reading/Language and Mathematics. The ANOVAs were not significant, but both Reading/Language and Mathematics had medium effect sizes. Scale scores in Reading/Language and Mathematics were higher among teachers at the excellent DAP level. As presented in Chapter 2, Burts *et al.* (1992) found that children in developmentally inappropriate classrooms exhibited more overall stress behaviors than did children in appropriate classrooms.

A one-way analysis of variance was conducted to evaluate the relationship between the classroom total DAP score and student achievement CRT/TCAP scores in Reading/Language and Mathematics. The ANOVAs were not significant but had moderate effect sizes. The teachers at the excellent DAP level had higher mean scores in Reading/Language than the teachers who were not at the excellent level.

### *Findings Compared to the Literature*

The literature suggested that teachers with high DAP scores tended to have early childhood or child development education at some point in their careers (McMullen, 1999). This study found that the teachers with Early Childhood majors had higher DAP scores than did the teachers with other college majors. Maxwell *et al.* (2001) found that classrooms taught by teachers with a master's degree were observed to be more developmentally appropriate than those taught by teachers with less education. This

study found no differences between teacher highest degree type and teachers' use of DAP practices. Like Maxwell's study, this study found no relationship between teachers' years of experience and DAP. Isenberg (1990) found that teacher judgments were directly influenced by knowledge and beliefs, which determined classroom instruction. Dunn and Kontos (1997) indicated that the more strongly teachers believed in DAP, the more likely they were to implement those practices in their classrooms. This study found that teachers with a great deal of DAP knowledge had higher APEEC scores than the teachers with little DAP knowledge. Huffman and Speer (2000) reported that very few early childhood education classrooms exemplified DAP. More specifically, Dunn and Kontos found that only about one fifth to one third of the early childhood classrooms fully demonstrated DAP. When analyzing the total APEEC scores, this study found that 5 out of 30 third-grade teachers exhibited excellent DAP.

### *Discussion*

A growing body of research on early childhood programs that reflect DAP suggested positive benefits for young children in academic, social, and behavioral domains. This study presented significant findings that the teachers engaging in more instructional DAP practices in Reading/Language were achieving advanced proficiencies. The APEEC items for the instructional context were as follows: (a) use of materials, (b) use of computers, (c) monitoring child progress, (d) teacher-child language, (e) instructional methods, and (f) integration and breadth of subjects. As presented in the literature review, teachers that obtained high DAP scores for use of materials used hands-on materials for a majority of the day. Hands-on materials, such as art supplies, games,

coins, blocks, unifix cubes, scales, three-dimensional shapes, counters, rulers, puppets, and plants, were easily accessible to students. Teachers that obtained high DAP scores for use of computers had at least two computers in the classroom and the students used the computer at least twice a week for a variety of purposes, such as reinforcing a skill, word processing, research, Internet, and drawing. Teachers that obtained high DAP scores for monitoring child progress employed a variety of ways to assess student learning, such as collecting permanent products, using anecdotal records, giving *PASS* assessments, creating authentic assessments, and using checklists for TN standards taught, among others. Teachers that obtained high DAP scores for teacher-child language exhibited mutual respect in the classroom. Teachers showed interest in children's statements or questions. The teacher's feedback was constructive, not critical. Children had opportunities to talk with their peers about classroom activities. Teachers required responses other than one correct answer, which required the students to think at higher levels. At the excellent DAP level, teachers prompted students many times a day to elaborate on their initial statements. Teachers that obtained high DAP scores for instructional methods did not use whole group instruction all day. Instead, the teachers used shared learning at least once a day. The teachers used a variety of teaching strategies in at least two subject areas. Group discussion was encouraged among the children. Teachers that obtained high DAP scores for integration and breadth of subjects planned activities or projects that required children to use skills from multiple-subject areas for at least half of the classroom time (Hemmeter *et al.*, 2001). Several teachers that engaged in high levels of developmentally appropriate practices in the instructional

context also obtained advanced proficiency in Reading/ Language. Specific examples of these teachers' practices are presented:

Teacher 9:

Hands-on materials were used in the subject area to support child learning. The teacher ensured that the students were using the materials properly. The teacher evaluated reading comprehension through role-playing.

Teacher 10:

The teacher individualized learning for all children during reading. The teacher had individual conferences with every child about their reading stories on a daily basis. Higher-Order or explanation questions were asked of the students during individual conferences.

Teacher 12:

The teacher grouped the students during reading instruction. The teacher formally scheduled a conference with each child every two weeks to discuss reading progress.

Teacher 21:

The teacher incorporated "book studies" in reading. Numerous 'books in a bag' were available for students to read throughout the day or take home. The teacher used a 'running record' for assessment and knew each students' reading level. The teacher never sat down throughout the observation and continuously monitored the students.

Teacher 24:

The students often used the Internet at school for research purposes and to practice reading skills. The teacher used practice *Terra Nova* assessments and recorded each child's skill proficiencies. The teacher taught reading through small groups. The teacher integrated specific skills while reading from trade-books to all individual groups.

Teacher 25:

The teacher integrated reading into every subject area. The teacher began each morning with small group reading – 1 to 3 students. This was in addition to the reading lesson. During small groups, the teacher made sure to place one adult with each reading group. The room literally looked like a 'library' – books were everywhere. Students read with partners at least once a week. Teacher commented, "*I need evidence of your answers.*" Specifically, the teacher required students to support their answers with details.

Teacher 27:

Reading skills were posted in the room. The teacher enthusiastically reviewed the *Terra Nova* skills through games or whole group learning. Reviews occurred often, but everyday prior to the *Terra Nova*. The teacher commented, “*If I want my students to be successful, I teach to the test.*”

The following themes, not necessarily measured by the APEEC, emerged during observation of teachers at the advanced proficiency level in Reading/Language. These themes could be related to obtaining high academic achievement and should be studied further:

1. Bulletin boards were instructional – not cute and fluffy.
2. Specific skills being covered at the present time were posted in the classroom.
3. Lesson plans were clearly aligned with TN Instructional Standards.
4. Direct instruction led to active involvement of the content. Specifically, students were not passive during the entire instructional time.
5. Reading/ Language Arts was integrated throughout the day in all subject areas.
6. Quality time was set aside daily for students to read with a partner (sometimes with upper-grade students).
7. Teachers taught reading using small groups almost daily. These groups were sometimes homogeneously or heterogeneously grouped based on the skill or content of the lesson and the students’ needs.
8. Skills were integrated naturally in the reading and/or writing lessons, not isolated.
9. Use of higher-order questions requiring additional explanation was used during reading groups.
10. Similar assessments, such as the *PASS* exam, were used to practice for the *Terra Nova*. Specifically, teachers could show me the skills where each child was or was not proficient.
11. Choices were offered and the teacher allowed flexibility at times based on student needs.

12. Teachers made use of the instructional assistants by having them work directly with the students instead of engaging in clerical work.
13. Some classroom teachers allowed all students to have water bottles in the room.
14. Duplicate materials were at each table for students to use.
15. The teachers maintained high expectations for all students.

A great deal of knowledge was gained from the 30 observations. Not only did the teacher allow observation, but many of these teachers wanted to give additional insight about how they believe children learn. During observations, the questions considered were what made a highly skilled or exemplary teacher, as outlined by *NCLB*, and what a master or highly qualified teacher should be practicing in their classroom. Therefore, several themes of highly-skilled teaching emerged during observation. On the contrary, other themes emerged that were considered as demonstrating a low level of teaching, thus, inhibiting high academic achievement. These themes were found in Figure 6, and should be considered for future studies. The best use of instructional teaching practices should focus on both of the quadrants, Q1 and Q2, which emphasized highly skilled teaching. As presented in the literature review, many of the Q4 practices were considered DAP myths.

← Traditional		DAP →
Highly Skilled Teaching ↑	Q1 <ul style="list-style-type: none"> <li>• Specific skills being taught</li> <li>• Direct teaching occurring</li> <li>• Individual Learning</li> <li>• Linguistic and Auditory Learning</li> <li>• Standard-Based Learning</li> <li>• Paper/Pencil Tasks</li> <li>• Mental Problem Solving</li> <li>• Memorization</li> </ul>	Q2 <ul style="list-style-type: none"> <li>• Differentiated instruction</li> <li>• Inquiry based learning</li> <li>• Cooperative Learning</li> <li>• Multiple Intelligences</li> <li>• Facilitated Learning</li> <li>• Multiple assessments</li> <li>• Hands-On-Learning</li> <li>• Learn by doing</li> <li>• Project Based Learning</li> <li>• Whole Child Focused</li> <li>• Student work displayed</li> <li>• Target ZPD (challenge)</li> <li>• Use of many strategies</li> </ul>
Low Skilled Teaching ↓	Q3 <ul style="list-style-type: none"> <li>• Many worksheets with limited teaching</li> <li>• Watered down curriculum – avoiding word problems, etc. because it is hard for children to understand</li> <li>• Rejecting DAP practices – one way approach only</li> <li>• No knowledge of standards</li> <li>• Skip some standards because too hard for students</li> <li>• Use of teacher manual for all lessons without use of enrichment</li> </ul>	Q4 <ul style="list-style-type: none"> <li>• Play without facilitation</li> <li>• Overload of hands-on materials</li> <li>• Overly permissive</li> <li>• Choices without challenge involved</li> <li>• Unstructured</li> <li>• Reject standards completely</li> <li>• Low interaction of teacher and students</li> <li>• Small group learning occurs, but no prompts for students to explain their thought process or questions</li> <li>• No expectations</li> </ul>

Figure 6. Instructional Teaching Style Matrix

This study presented significant findings that the more knowledge a teacher had about developmentally appropriate practices, the more likely that teacher would implement developmentally appropriate practices in the classroom. Without doubt, teachers can and do make a positive difference for their students. The next step in this era of *No Child Left Behind* is to continue the journey of investigating, researching, and reflecting on the effects of appropriate versus inappropriate practices on the lives of young children.

#### *Recommendations for Research*

1. Further studies involving the primary grades could be conducted with larger samples of teachers from various geographical locations to determine whether or not the results from this sample can be generalized to the larger population. It would be particularly interesting to include other variables in the study, such as: (a) class size, (b) gender, (c) use of other practice exams prior to *TCAP* such as the *PASS* assessment, and (d) other academic content areas.
2. Both quantitative and qualitative research could provide additional information needed to contribute to the body of research. Through qualitative analysis, one could gain additional insight into teachers' perceptions and views of children.
3. Additional primary quantitative instrumentation is needed to examine developmentally appropriate practices and student achievement. More importantly, specific instructional pedagogical items are needed as a measure of developmentally appropriate practices.

4. More research is needed to determine why teachers with varying years of experience exhibit more or less DAP in their classrooms.
5. More research is needed to examine the impact of the physical environment on student achievement.
6. More research on the relationship of developmentally appropriate math instruction in the primary grades and student achievement is clearly needed. Perhaps one can then better understand how primary teachers can incorporate hands-on-learning into an intellectually challenging math curriculum.
7. More research is necessary to examine the impact of the social environment on student achievement in the primary grades.

#### *Recommendations for Practice*

1. School directors, central office supervisors, and principals should invest time and resources in staff development opportunities for teachers to learn more about best practices in Scientific-Based Research and What Works Clearinghouse as advocated by *No Child Left Behind*.
2. Teachers should use the *APEEC* to rate themselves on their own teaching practices. This reflective activity could be a stepping stone to improve their teaching practices, classroom social environment, and classroom design.
3. Teachers should examine their own classroom practices using the Instructional Teaching Style Matrix (Figure 6) to determine if their classroom teaching practices reflect highly skilled teaching.

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## APPENDICES

### APPENDIX A

#### IRB INFORMED CONSENT DOCUMENT

#### EAST TENNESSEE STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD

**PRINCIPAL INVESTIGATOR:** Tausha Clay

**TITLE OF PROJECT:** The Relationship of Student Achievement and Classroom Practices Among Third-Grade Teachers in East Tennessee

- ☺ This Informed Consent will explain about being a research subject in this study. It is important that you read this material carefully and then decide if you wish to be a volunteer.

**PURPOSE:** The purpose of this research study is to investigate third-grade teacher characteristics and classroom teaching practices at selected schools in East Tennessee. Similar research involving the use of developmentally appropriate practices in preschools and kindergarten has been conducted in the past by other researchers, but there is limited research in the primary grades.

**DURATION:** Classroom observations should take no more than a half-day to complete. The demographic survey is brief and should take no more than 5 to 10 minutes to complete.

**PROCEDURES:** The basic procedures for this research study will be to observe during classroom instructional time for no more than a half-day. This will be arranged in advance with you. The instrument, Assessment of Early Elementary Practices, will be used to investigate three areas: (1) classroom environment, (2) instructional context, and (3) social context.

**POSSIBLE RISKS/DISCOMFORTS:** No risks or discomforts should be associated with this research. I will make every effort to not disrupt your normal teaching routine. As a possible benefit, this study will provide teachers more insight on the use of developmentally appropriate practices in primary grades.

**CONTACT FOR QUESTIONS:** If you have any questions please contact Tausha Clay at XXX.XXX.XXXX or at [taushaclay@earthlink.net](mailto:taushaclay@earthlink.net) or my chair, Dr. Louise MacKay, at 423.439-7615. You may also contact The Institutional Review Board at 423.439.6053 regarding your rights as a research participant.

CONFIDENTIALITY: Every attempt will be made to see that the study results are kept confidential. School names and teachers will not be identified. Systems, classrooms, and schools will be labeled as “A”, “B”, “C”, etc. Your individual observational results will not be available to anyone except you by request. A copy of the records from this study will be stored in my home at XXXX XXX XX, XXXXX XXXXX, TN XXXXX for at least 10 years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a participant. Although my rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the East Tennessee State University/V. A. Medical Center Institutional Review Board (or ETSU IRB for non-medical research), the Food and Drug Administration (if applicable), \***V. A. Medical Center Research & Development**, and research related personnel from the ETSU Department of Educational Leadership have access to the study records. My records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above.

COMPENSATION FOR MEDICAL TREATMENT: East Tennessee State University (ETSU) will pay the cost of emergency first aid for any injury that may happen as a result of your being in this study. They will not pay for any other medical treatment. Claims against ETSU or any of its agents or employees may be submitted to the Tennessee Claims Commission. These claims will be settled to the extent allowable as provided under TCA Section 9-8-307. For more information about claims call the Chairman of the Institutional Review Board of ETSU at 423/439-6053.

VOLUNTARY PARTICIPATION: The nature, demands, risks, and benefits of the project have been explained as well as are known and available. I understand what my participation involves. Furthermore, I understand that I am free to ask questions and withdraw from the project at any time. I have read, or have had read to me, and fully understand this consent form. I sign it freely and voluntarily. The study record will be maintained in strictest confidence according to current legal requirements and will not be revealed unless required by law.

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Teacher’s Name \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Investigator’s Signature \_\_\_\_\_

Date \_\_\_\_\_

APPENDIX B  
LETTERS TO SUPERINTENDENTS, PRINCIPALS AND TEACHERS

EAST TENNESSEE STATE UNIVERSITY  
Department of Educational Leadership and Policy Analysis  
Teaching Practices and Student Achievement in Third-grade  
January 2005

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Dear Superintendent:

Please allow me to introduce myself. I am Tausha Clay, a Doctoral Fellow for the Department of Educational Leadership and Policy Analysis at East Tennessee State University. I am presently completing the requirements for the Ed.D. degree. As part of my dissertation requirements, I will be conducting a blind-study, researching the relationship of teaching practices and student achievement among third-grade teachers in Upper East Tennessee.

This letter is to request your permission to survey and observe a selection of third-grade teachers within your school system during Spring of 2005. Because the nature of my study will focus on achievement success, I am also requesting permission to be granted access to each selected teachers' 2004-2005 TCAP Achievement CRT Class Record Sheet in Reading/Language and Math. Each teacher's CRT class record sheets will be kept in the strictest of confidence. At no time will any names (teachers, systems, and students) be attached to any part of the dissertation. You will be assured of anonymity.

Recognizing that school economically disadvantaged percentiles could impact student achievement, I deliberately chose the following elementary schools in your system to be included in the sample based on SES similarities: XXXXXXXXXX, XXXXXX, XXXXXXXX, and XXXXXXXX.

For you to have more information, the instrumentation which I plan to use for this study is entitled *Assessment of Practices in Early Elementary Classrooms* (APEEC). I have also enclosed the proposed demographic survey to be used for the study.

I am requesting your approval to contact the above schools' principals in order to fulfill my dissertation requirements. Additionally, I am requesting approval to contact your testing coordinator to obtain the 2004-2005 CRT class record sheets as they become available. Please contact me personally at XXX.XXX.XXXX or XXX.XXX.XXXX, and/or e-mail me at XXXXXXXXXXXXXXXXXXXX, with your recommendation. Thank you in advance for your consideration. Your assistance in helping me complete this study will be greatly appreciated.

Sincerely,  
Tausha Clay,  
Doctoral Student

Louise MacKay,  
Dissertation Chair

EAST TENNESSEE STATE UNIVERSITY  
Department of Educational Leadership and Policy Analysis  
Teaching Practices and Student Achievement in Third-grade  
January 2005

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Dear Principal:

Please allow me to introduce myself. I am Tausha Clay, a Doctoral Fellow for the Department of Educational Leadership and Policy Analysis at East Tennessee State University. I am presently completing the requirements for the Ed.D. degree. As part of my dissertation requirements, I will be conducting a blind-study, researching the relationship of teaching practices and student achievement among third-grade teachers in East Tennessee.

Recognizing that school economically disadvantaged percentiles could impact student achievement, I targeted a total of 14 schools within four school systems with similar demographics for this study. Your school's third-grade teachers have been chosen for the sample based on school SES similarities.

This letter is to request your permission to survey and observe all willing third-grade teachers within your school. The survey is attached and should take no more than five minutes to complete. The instrumentation being used for this study is the *Assessment of Practices in Early Elementary Classrooms* (APEEC). Using the APEEC, I am requesting to observe the third-grade classrooms during Reading/Language and Math instruction. All of the information will be kept in the strictest of confidence. At no time will any names (teachers, systems, and students) be attached to any part of the dissertation. You will be assured of anonymity.

I have requested and have been granted permission from your Director of Schools to conduct research in your school. I am now requesting your approval to contact all third-grade teachers at your school in order to fulfill my dissertation requirements. Please call me personally at XXX.XXX.XXXX or XXX.XXX.XXXX, and/or e-mail at XXXXXXXXXXXXXXXX with your recommendation. Thank you in advance for your consideration. Your helpfulness and cooperation will be highly appreciated.

Sincerely,

Tausha Clay  
Doctoral Student

Louise MacKay,  
Dissertation Chair

EAST TENNESSEE STATE UNIVERSITY  
Department of Educational Leadership and Policy Analysis  
Third-Grade Teachers in Upper East Tennessee  
January 2005

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Dear Teacher:

Please allow me to introduce myself. I am Tausha Clay, a Doctoral Fellow for the Department of Educational Leadership and Policy Analysis at East Tennessee State University. Previously, I taught in Sullivan County Schools for approximately six years. Prior to that, I taught fourth grade in North Carolina for two years. From my own experience as a teacher I know how busy life is for you. However, I greatly need your help with the research required for my dissertation.

I would like to include you, along with about thirty other third-grade teachers throughout East Tennessee, in my doctoral research project, which has been designed to study the relationship between teacher practices used in third-grade and student achievement. With this in mind, I am requesting your assistance with the following:

1. A Brief “Demographic Background” Questionnaire Sheet
2. A Partial to Full Day Classroom Observation

All of the information will be kept in the strictest of confidence. I will not share observation or survey information with anyone but you. At no time will names (teachers, systems, and students) be attached to any part of the dissertation. Numbers will be assigned to all participants.

I have received prior permission from your Director of Schools and from your Principal to conduct this study. Your participation in this project is completely voluntary. I will contact you regarding participation in the study or you may contact me personally at XXX.XXX.XXXX or XXX.XXX.XXXX, and/or e-mail at [taushaclay@earthlink.net](mailto:taushaclay@earthlink.net) at your convenience. I will be happy to answer any questions that you may have concerning this research project.

It is because of you that I can even attempt such a study, and I thank you in advance for your contributions. Your helpfulness and cooperation will be highly appreciated.

Sincerely,

Tausha Clay  
Doctoral Student

Louise MacKay,  
Dissertation Chair

APPENDIX C

DEMOGRAPHIC SURVEY

1. What was your major in college?
  - a. Early Childhood Education
  - b. Elementary Education
  - c. Other \_\_\_\_\_
  
2. What is the highest degree you have earned?
  - a. Bachelor's degree
  - b. Master's degree
  - c. Specialist degree
  - d. Doctoral degree
  
3. What is your teacher certification?
  - a. Early Childhood (PreK-3 or 4)
  - b. Elementary Education (K-8)
  - c. Other \_\_\_\_\_
  
4. Are you considered "highly qualified" under NCLB?
  - a. Yes
  - b. No
  - c. In Process
  
5. How many total years have you taught including this year? \_\_\_\_\_
  
6. How many years have you taught third-grade including this year? \_\_\_\_\_
  
7. Which additional grades have you taught? Circle all that apply.
  - a. Kindergarten
  - b. First
  - c. Second
  - d. Fourth
  - e. Fifth
  - f. Other \_\_\_\_\_
  
8. Where did you receive your teaching degree? ETSU or Other \_\_\_\_\_
  
9. How many children are in your classroom? Boys \_\_\_\_\_ Girls \_\_\_\_\_
  
10. On a scale of 1-5, what is your knowledge of developmentally appropriate practice with 1 being little or no knowledge to 5 being a great deal of knowledge?  
1                      2                      3                      4                      5

11. Has the current law NCLB, changed your third-grade teaching practices? \_\_\_\_\_

## APPENDIX D

### CLARIFICATION INTERVIEW QUESTIONS

1. When are the children allowed to use a defined space to work alone?
2. How often do you change the display of children's work?
3. How are the pieces of children's work selected for display?
4. Do you have first aid equipment in the room?
5. Describe the equipment you keep in the room.
6. Is there a phone in the classroom?
7. Is there a working two-way intercom system in the classroom?
8. Do you keep first aid manuals or information in the room?
9. Where is the children's medical and emergency information kept?
10. What safety precautions do you take specifically related to children with disabilities?
11. Are you or your assistant certified in first aid?
12. What kinds of things do you do in math, language arts, science, and social studies?
13. How often do children use computers?
14. Do children use the Internet?
15. What kinds of things do children do on the computers?
16. How do you evaluate children's work and progress?
17. What are all the ways you use the information you collect?
18. Do you have formal conferences with children like you do with parents?
19. If so, how often do you have these conferences and what do you discuss?

20. How often do you evaluate work and progress?
21. Do you keep track of children's progress on IEP objectives?
22. How often do children have physical education?
23. What do you do when it is bad weather and you can't go outside for recess?
24. How often do you cover Math, Language Arts, Science, and Social Studies?
25. Do children help make any decisions that affect the entire class or a group of children?
26. If so, what kind of decisions and how often do children make these kinds of decisions?
27. Do you know the specific IEP objective for all the children in your class who have IEPs?
28. How do you address multicultural or other diversity issues?
29. What happens if a child does not finish something during the time you have allotted?
30. What happens if a child finishes something early?
31. How do you communicate with families?
32. How often do you communicate with families?
33. What are the ways you communicate with families about their child's progress?
34. How often do you communicate about progress?
35. Are there opportunities for families to be involved in the class? What kinds?
36. Can families visit the classroom?
37. Have you met all the parents?
38. Are parents ever asked to evaluate the school, class, or teacher? How often?

## APPENDIX E

### INTER-OBSERVER RELIABILITY ON THE APEEC

Item	% Agreement within 1 point
Room arrangement	100
Display of child products	100
Classroom accessibility	100
Health and classroom safety	100
Use of materials	100
Use of computers	100
Monitoring child progress	100
Teacher-child language	100
Instructional methods	100
Integration and breadth of subject	100
Children's role in decision making	100
Participation with children with disabilities	N/A
Social skills	100
Diversity	100
Appropriate transitions	100
Family Involvement	100

Note: The three items that were not 100% exact agreement between the inter-rater and me were (a) use of materials, (b) children's role in decision making, and (c) appropriate transitions.

VITA

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