Multiage grouping: Interactions among and between students and teachers, instructional strategies, and influences on teachers' constructs as defined through an accelerated schools context

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MULTI-AGE GROUPING: INTERACTIONS AMONG AND
BETWEEN STUDENTS AND TEACHERS, INSTRUCTIONAL
STRATEGIES, AND INFLUENCES ON TEACHERS'
CONSTRUCTS AS DEFINED THROUGH AN
ACCELERATED SCHOOLS CONTEXT

by

Francine A. Mayfield

A doctoral thesis submitted in partial fulfillment
of the requirements for the degree of

Doctor of Education

in

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ABSTRACT

This ethnographic study explored the interactions among and between students and teachers, instructional strategies and academic shifts, and the influence of those instructional strategies and academic shifts on teachers' constructs defined through a multi-age context. This eight month study was conducted in an elementary school organized under the governance structure of Accelerated Schools with all classes grouped in multi-age configurations.

Participants selected were primary and intermediate teachers and students within the elementary school who had been at that site for one to three years. Participating teachers were both experienced and novice ranging from two to twenty years of experience. This southwestern elementary school was classified as at-risk with 38 percent of its population receiving free or reduced lunch and 25 percent classified as homeless. As both researcher and principal of the school, this study expanded the boundaries commonly classified as action research. Data was collected through interviews, observations, and surveys, and analyzed to form categories related to the research questions.

Data revealed that positive academic shifts occurred within this multi-age context. Interactions among and between students and teachers influenced the teaching/learning process and were facilitated by the multi-age organization. The instructional strategies utilized within this context were influenced by the multi-age grouping of students. These strategies were a significant addition to the body of research exploring the effectiveness of multi-age grouping. Additionally, teachers' constructs both shifted and were validated, depending on the entry level of the teacher, veteran or novice, and their initial educational beliefs and teacher education programs. A model emerged that was depicted as a story of action within a theory of context: the phases of interactions that occurred within this multi-age setting. Finally, the organizational structure of Accelerated Schools impacted this multi-age context through its unifying principles and accountability processes.
TABLE OF CONTENTS

ABSTRACT ............................................................................................................................. iii

ACKNOWLEDGMENTS ................................................................................................... viii

CHAPTER 1 OVERVIEW OF THE STUDY ................................................................. 1
Introduction .................................................................................................................. 1
Statement of Problem ................................................................................................. 2
Theoretical Framework .............................................................................................. 6
Contributions and Implications ................................................................................. 7
Synopsis of Methodology .......................................................................................... 7
Definition of Terms ................................................................................................... 10

CHAPTER 2 REVIEW OF LITERATURE ................................................................. 12
Section One: Social Constructivism ........................................................................ 13
Section Two: Multi-Age Grouping .......................................................................... 15
Background ................................................................................................... 15
Grouping Patterns ......................................................................................... 17
Section Three: Instructional Strategies .................................................................. 19
Brain Research ............................................................................................. 19
Reading ......................................................................................................... 25
Writing .......................................................................................................... 26
Mathematics ................................................................................................. 26
Science .......................................................................................................... 27
Cooperative Learning ..................................................................................... 28
Integrated Instruction .................................................................................. 28
Section Four: The At-Risk Student: Interactions Between Students and Teachers that Influence Academic Achievement .......................................................... 29
At-Risk .......................................................................................................... 30
Teacher Acceptance .......................................................................................... 32
Student Acceptance ....................................................................................... 33
Social Organization of Talk ........................................................................... 34
Section Five: Accelerated Schools ......................................................................... 39
Section Six: Conclusion ........................................................................................... 42
CHAPTER 3 RESEARCH METHODOLOGY ............................................................. 44
Section One: Research Context ................................................................. 44
  Accelerated Schools Project ................................................................. 45
  Multi-Age Grouping .......................................................................... 46
Section Two: Research Participants ......................................................... 48
Section Three: Research Method ............................................................. 48
Section Four: Data Collection and Analysis ............................................... 49
  Coding Process .............................................................................. 52
Section Five: Goodness of Study .............................................................. 52
  Credibility .................................................................................. 53
  Transferability ............................................................................ 53
  Confirmability ............................................................................. 54
  Dependability ............................................................................. 54
Section Six: Assumptions and Limitations of the Study ............................. 54

CHAPTER 4 QUALITATIVE INVESTIGATION .................................................. 55
Pedagogical Philosophy ........................................................................... 57
The Context ......................................................................................... 58
Social Interactions Between Selected Students and Students .................... 60
  Complementary Roles .................................................................. 61
  Students' Relationships with Audience ......................................... 63
  Student as Collaborator ............................................................... 65
  Student Status ............................................................................ 67
  Students' Exploratory Talk ........................................................... 69
Summary of Social Interactions Between Selected Students
  and Students ............................................................................... 70
Social Interactions Between Selected Students and Teachers ................... 71
  Teacher-as-Facilitator ................................................................. 71
  Teacher-as-Learner .................................................................... 73
Summary of Social Interactions Between Selected Students
  and Their Teachers ....................................................................... 75
Instructional Strategies .......................................................................... 75
  Academic Shifts ......................................................................... 76
  Individualized Instruction ............................................................ 76
  Questioning .............................................................................. 78
  Process Instruction .................................................................... 79
  Integrated Instruction ................................................................... 81
  Flexible Grouping .................................................................... 82
  Joint Planning ........................................................................... 84
Summary of Instructional Strategies ......................................................... 85
The Influences of Social Interactions and Instructional Practices
in a Multi-Age Context ................................................................. 86
Classroom as Family ................................................................. 86
  Student Self-Responsibility .................................................... 88
  Value of Age Diversification .................................................. 89
Summary of Influences of Social Interactions and Instructional
Strategies in a Multi-Age Context ............................................. 90
Influence of Social Interactions on Selected Teachers' Constructs about
Classroom Instruction in a Multi-Age Context ....................... 91
  Multi-Age Grouping as Advocate of Beliefs ............................ 91
  Accelerated School Impact .................................................... 94
  Unity of Purpose ................................................................. 94
  Empowerment Coupled with Responsibility .......................... 95
  Building on Strengths .......................................................... 96
Summary of Themes ................................................................. 98

CHAPTER 5 SUMMARY OF FINDINGS, WORKING HYPOTHESES,
IMPLICATIONS, AND FURTHER RESEARCH .............................. 100
Summary of Findings ............................................................... 101
  Overview ................................................................. 101
  Context ................................................................. 101
  Social Interactions Between Students and Students ............... 102
  Social Interactions Between Teachers and Students ............... 105
  Instructional Strategies Utilized in a Multi-Age Context .......... 107
  Integrated, Process Oriented Instruction ............................... 108
  Questioning ............................................................... 109
  Flexible Grouping .......................................................... 110
  Influences of Social Interactions and Instructional Practices ... 112
  Classroom as Family ....................................................... 113
  Student Self-Responsibility ............................................... 113
  Value of Age Diversity ..................................................... 114
Influences of Social Interactions on Selected Teachers' Constructs
about Classroom Instruction in a Multi-Age Context ................. 116
  Accelerated Schools Impact ............................................... 120
  Unity of Purpose .......................................................... 120
  Empowerment Coupled with Responsibility ......................... 121
  Building on Strengths ....................................................... 121
The Model ............................................................................. 122
  The Story of Action ......................................................... 124
  The Theory of Context ....................................................... 125
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To my husband, Terry, and son, Neil, thanks for your patience, understanding, and encouragement when all my time, energy, and physical presence was focused on analysis of data and writing. There truly is a "life after dissertation", let's go for it!
CHAPTER ONE

Overview of the Study

Introduction

Mass public education and graded practices took root with the beginning of the industrial revolution (Miller, 1990). A means of organizing and classifying the increasing number of students during the industrial revolution was to place them into age or grade divisions. The advent of the grade-specific textbooks and state supported education further solidified graded school organization (Goodlad & Anderson, 1963).

Changing demographics, a shift from the industrial to the informational age, and commitment to educate our entire population has collectively created a need to examine the feasibility of compulsory educational programs as they now exist (Anderson & Pavan, 1993). Organized by single grades, mandatory education has assumed that students who are the same age are basically at the same level of cognitive development, that they can be taught in the same way, and that they will progress at the same rate. Intellectual development is assumed to be the educational goal. Moreover, the division of curriculum into discrete skills and subjects is thought to be the most effective instructional organization.

Examinations of educational programs have often resulted in the development and hurried implementation of educational innovations that have shown few positive effects (Hord, Rutherford, Austin, Hall, 1987). Such innovations as individualized education (Burtley, 1974), open classrooms (Bell & Switzer, 1976), and even non-graded education (Miller, 1990) have fallen victim to haphazard implementation.
One particular innovation that has recently gained attention is non-graded or multi-age education. This is the practice of teaching children of different ages and ability levels together, without dividing them or the curriculum into steps labeled by grade designations (Anderson & Pavan, 1993). Children move from easier to more difficult material at their own pace, making continuous progress, and curriculum and teaching practices are developmentally appropriate and integrated (Gaustad, 1992).

There are many reasons behind the trend toward non-graded or mixed-age grouping. There is widespread concern about the high proportion of young children who are retained in the early grades and a disproportionate number of culturally different students experiencing school failure (Cuban, 1989). Increasing recognition that grade repetition does not help children overcome difficulties in meeting narrow and specific grade achievement expectations, attempts to implement developmentally appropriate teaching and curriculum practices in the early grades, and growing awareness of the potential benefits of cross-age interaction to intellectual and social development have also fueled the trend (Katz, 1990).

This study examined various aspects of multi-age classrooms within one selected school. Multi-age school is defined here as students grouped with age spans greater than one year, curriculum and instructional practices that maximize interactions between students and between teacher and students, social and academic cooperation among children of various ages, and an increased sense of family within class and school.

**Statement of Problem**

Traditionally, students are assigned to classrooms according to a single age delineation. Within these classrooms the teacher provides what tends to be a tightly prescribed curriculum. A curriculum that often translates to instructional strategies where the teacher provides direct instruction, students use worksheets, dittos and other abstract learning materials and memorization and drill are emphasized (NAEYC, 1986). Studies
suggest that students within the mainstreamed culture are more successful with this type of curricular and instructional framework (Anderson & Pavan, 1993). Additionally, retention of students is viewed as a means of adjusting for lack of content mastery or social maturity, and a significant number of at-risk students fail to become literate or view themselves as learners.

In response to some of the instructional practices being identified in traditional classroom settings and their effect on at-risk students, a number of multi-age schools defined by an increasing number of ethnically diverse student body populations and representing low socioeconomic status, have demonstrated increased academic competencies and enhanced self-esteem as compared to their counterparts in traditional classes (Anderson & Pavan, 1993). These changes may be caused by multi-age grouping. Multi-age grouping, which recognizes the normal, developmental cognitive continuum of children, has allowed for interaction of students through process learning approaches, views teacher-as-facilitator, creates an environment that is student centered, and recognizes students' experiences as beginning points for instruction. The purpose of this study was to determine the influence of multi-age grouping on identified at-risk elementary students' academic and social progress in school. To achieve this purpose, the study explored the academic and social interactions of students and the instructional practices used by teachers in one multi-age school.

Specifically, this study had five goals:

1. To examine the social interaction among identified at-risk students with other classmates in a multi-age classroom.
2. To examine the nature of social interactions of selected students with their teacher in a multi-age classroom.
3. To examine the achievement shifts that occurred as a function of these social interactions between teachers and students over time.
4. To examine the influences of social interactions and instructional practices in a multi-age context.

5. To examine how these social interactions influenced selected teachers' constructs about classroom instruction in a multi-age setting.

These goals were addressed through the following questions:

1. What is the nature of the social interactions of selected at-risk students with other classmates in a multi-age classroom?

2. What is the nature of social interactions of selected at-risk students with their teacher in a multi-age classroom?

3. What are the instructional strategies utilized with at-risk students in a multi-age school where academic shifts have occurred over time?

4. What are the influences of social interactions and instructional practices in a multi-age context?

5. How do these social interactions influence selected teachers' constructs about classroom instruction in a multi-age setting?

Figure One provides a global representation of the research questions, their purposes, and methods of data collection.
**Figure 1: Research Questions Representations**

<table>
<thead>
<tr>
<th>WHAT DO I NEED TO KNOW?</th>
<th>WHY DO I NEED TO KNOW THIS?</th>
<th>WHAT KIND OF DATA WILL ANSWER THIS QUESTION?</th>
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</thead>
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<td>* What is the nature of social interaction of selected at-risk students with other classmates in a multi-age classroom?</td>
<td>* To assess the impact of multi-age grouping, in relationship to social interactions, among students.</td>
<td>* observations</td>
</tr>
<tr>
<td>* What is the nature of social interaction of selected at-risk students with their teacher in a multi-age classroom?</td>
<td>* To assess the impact of multi-age grouping, in relationship to social interactions, between teachers and students.</td>
<td>* observations</td>
</tr>
<tr>
<td>* What are the instructional strategies utilized with at-risk students in a multi-age school where academic shifts have occurred over time?</td>
<td>* To determine the instructional strategies utilized by teachers in a multi-age setting.</td>
<td>* observations</td>
</tr>
<tr>
<td>* What are the influences of social interactions and instructional practices in a multi-age context?</td>
<td>* To assess the relationship between social interactions and the instructional practices utilized in a multi-age context.</td>
<td>* observations</td>
</tr>
<tr>
<td>* How do these social interactions influence selected teachers' constructs about classroom instruction in a multi-age setting?</td>
<td>* To determine the influence of socially constructed interactions on teachers' constructs regarding classroom instruction.</td>
<td>* observations</td>
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</table>
Theoretical Framework

This study was grounded in the theory of social constructivism (Gordon, 1990). A social constructivist view of learning has its philosophical roots in the work of Wittgenstein (1953), Mead (1975), and Harre (1984) and shares the conceptualization of knowledge as a social artifact that is maintained through a community of peers. Knowledge, then, is not based on an objective reality that can be measured and quantified, but rather is consensually formed through social interaction (Brufee, 1984; 1986).

The psychological roots of social constructivism are based on the theories of Vygotsky (1978, 1981). In this view, knowledge is constructed by interactions between individuals within the society; all thought being social in nature. Learning is considered an internalization of social interaction that occurs first between individuals and then within an individual (McCarthey & Raphael, 1989). Internalization occurs within the "zone of proximal development" through "adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p.86). The zone of proximal development "in terms more commonly used in education, is the region between the child's mastery level and instructional level, the former being that at which skills can be exercised independently, and the latter that at which skills can be applied reliably only with the assistance of more capable others" (Peterson, Wilkinson, & Hallinan, 1984, p.19). Social constructivist theories then, are based on the assumptions that a) knowledge is constructed by the interaction of the individual with the social/cultural environment; b) higher mental functions are social cultural in nature; and c) knowledgeable members of the culture can assist others in learning (McCarthey & Raphael, 1989).

The findings of Wertsch (1979) demonstrate the relationship of social constructivist theory to this study in their discussion of the importance of analyses of the characteristics and patterning of interactions between children and their teachers. As the characteristics and patterns of interactions (Wertsch, 1979) between teachers and students
within the social structure of the classroom unfold, the internalization of these interactions may reveal the learning that occurs (McCarthey & Raphael, 1989). The study of classroom lessons should also show movement from others to self-regulation again resulting in the internalization of learning (Goodman, 1986).

**Contributions and Implications**

This study added to and expanded the body of research regarding multi-age grouping. It provided additional information pertaining to descriptions of multi-age contexts and academic gains. Anderson and Pavan (1993) stated that few studies make any attempt to evaluate or assess the degree to which the stated procedure [multi-age philosophy] was actually operative.

Additionally, this study contributed to the research in the area of program development. Specifically, it delineated critical elements of effective multi-age teaching in relation to the social interactions between students and students and students and teachers, critical instructional factors inherent in multi-age grouping and the impact of the aforementioned elements on teachers' constructs; areas that have been explored in a very limited manner in the current research and are critical to the development of successful programs (Anderson & Pavan, 1993).

**Synopsis of Methodology**

Qualitative research methodology was selected to examine the ongoing social interactions of teachers and students within a multi-age classroom context. For this study, methods included observation, interview, and survey techniques (Strauss & Corbin, 1990).

Therefore, this study employed an ethnographic design (Strauss & Corbin, 1990). To gain a thorough understanding of the nature of a) the social interactions of selected at-risk students with other classmates and teachers, b) the instructional strategies utilized where achievement shifts have occurred as a result of this interaction, and c) how these social interactions influenced teacher constructs about classroom instruction, I collected
data on a regular basis for a period of one semester in a single school site. I also utilized historical data, in the form of artifact review (LeCompte & Preissle, 1993) (e.g., attendance reports, criterion and norm referenced test scores, and number of discipline referrals) from a period of three years. The consistent and ongoing contact I established with the school setting was necessary to observe and explore behaviors, processes, and events (Marshal & Rossman, 1989; Yin, 1989) that impact the social interactions of selected students in the multi-age setting and to examine the contextual layers within the school (Anderson & Pavan, 1993; Erickson, 1986).

As a school administrator for seven years I developed a theoretical sensitivity (Strauss & Corbin, 1990) for the criterion necessary to implement a multi-age school. This theoretical sensitivity enabled me to select (Lincoln & Guba, 1985) a school site that represented a unique case and served a revelatory purpose (Yin, 1989). The school site was unique in that it was one of the first in this district to institute a multi-age setting ages 6-10 and met the standards of a non-graded/multi-age school, defined by Anderson and Pavan (1993), as evidenced through the application of the Accelerated Schools philosophy and principles (Levin & Hopfenberg, 1991).

The school site had the potential of serving a revelatory purpose (Strauss & Corbin, 1990). As researcher, I had access to observations of classroom dynamics, interactions between, and interviews with, students and teachers. These students and teachers were recognized for their involvement in the implementation of a multi-age setting, through the Accelerated Schools process. Additionally, the selected students in this study received schooling in a traditional school setting and then transferred, as a body, to the multi-age setting where they had been in attendance for a period of approximately two years.

To systematically identify my subjectivity throughout the course of my research I followed Peskin's (1978) direction. By so doing, I identified and disclosed the subset of personal qualities where "self and subject become joined" (p. 184). This formal, systematic
monitoring of self combined Peskin's (1978) monitoring procedures and began with an analysis of my own educational philosophy: an educational philosophy was built on the beliefs that one builds on student strengths and recognition that every child brings educational experiences into the classroom, but those experiences may be non-standard, and finally, a philosophy founded on the belief that the classroom is not preparation for life, but life itself (Dewey, 1956). The acknowledgment of my biases added to the value and reliability of researching, as principal, my own school.

Additional support and value of researching my own school was found in the literature of practical inquiry (Richardson, in press). Practical inquiry is described as research undertaken by practitioners to improve their own practice. "Research on the practice of teaching is undergoing significant change; change that reflects considerations of power and voice, the nature of knowledge, and research methods" (p. 5). This change recognized the strength of inquiry when accomplished by the practitioner for the purpose of improving/researching the context of the individual practitioner.

The questions of power and control addressed the considerations of who creates, constructs, or reconstructs knowledge about teaching practice. These considerations were addressed by researchers, in conjunction with practitioners, in order to enhance the validity of studies (Connelly & Clandinin, 1990; Elliott, 1988; Goldenberg & Gallimore, 1991). The research methods involved the use of participant observation within the context of classrooms or schools of and by the individual practitioner (Richardson, in press).

Additionally, there has been a strong movement towards teacher research that gives voice to practitioners, allows them to communicate their wealth of knowledge to other practitioners and helps them improve their practice (Cochran, Smith & Lytle 1990; Hollingsworth & Sockett, 1994) "One could perhaps suggest that it is a teacher who knows best what it means to be a teacher" (Richardson, in press, p.5). Conducting practical inquiry, as principal of the school being researched, I identified my own biases,
developed a stronger understanding of my own practice and how I made inferences relating to my "practice" or school, thereby informing the field of research by a practitioner for the purposes of improving that practice.

Primary sources of data collection included field observations, document reviews, interviews and surveys. Open-ended (Seidman, 1991; Yin, 1989) and non-standardized (Zilditch, 1962) interviews were conducted with both students and teachers. Observations which included stream-of-behavior chronicles (Barker, 1963) and participant-construct surveys (Weller & Romney, 1988) were developed and administered. Document reviews (artifacts) were used to provide additional evidence for the questions addressed in this study.

In the remainder of this dissertation I have included a review of literature, methodology related to the study, analysis of the data, conclusions and implications for further study as defined by data collected in relation to target questions.

Definition of Terms

**Multi-Age Grouping:** Class composition that takes advantage of the heterogeneity of experience, knowledge, and skills in a group of children with an age range of more than one year (Katz, 1990). Furthermore, this specific model sets out to increase the sense of family within the class and school and encourages children with different levels of knowledge and experiences to learn together.

**Non-graded Classrooms:** Grouping of children in classes without grade-level designations and with more than one year age span.

**Combined Classes:** The inclusion of more than one grade level in a classroom and includes the required curriculum for each of the two grades represented. The main goal appears to be to maximize personnel and space rather than to capitalize on the
diversity of ability and experiences in the groups with mixed ages (Anderson & Pavan, 1993).

**Continuous progress:** Children remain with their classroom peers in an age cohort regardless of whether they have met pre-specified grade level achievement expectations. It is usually associated with a strong emphasis on individualizing the curriculum so that teaching and learning tasks are responsive to the previous experiences and rates of progress regardless of age (Katz, 1990).
CHAPTER 2

Review of Literature

Examining the effectiveness of multi-age grouping, this review will explore literature related to: (a) social constructivism, the theoretical framework in which this research is grounded, (b) multi-age grouping and its characteristics, (c) instructional strategies as they relate to a multi-age context to academic growth (d) the social interactions between at-risk students and students, and between teachers and students and those interactions to academic growth, and (e) the Accelerated Schools process and its characteristics.

Section One will review the theoretical framework of social constructivism and its relationship to the study. Section Two will review multi-age grouping: its background and the research relating to grouping patterns and curriculum approaches. Section Three will address current research on the human brain: its relationship to learning and instructional strategies. This investigation will serve as the foundation for determining those instructional strategies that may influence academic growth in a multi-age context. Section Four will review the literature as it relates to the social interaction between at-risk students and teachers and that relationship to academic growth. Section Five will address the Accelerated Schools Process. In the final section, I will draw conclusions about the influence of the variables presented in this review and their relationship to the direction of the study.
Section One: Social Constructivism

"We cannot teach directly, in the sense of putting fully formed knowledge into people's heads; yet, is our charge to help people construct powerful and ... correct interpretations of the world. We must take into account learners' existing conceptions, yet at the same time help them to alter fundamentally their ... misconceptions." (Resnick & Chi, 1988)

The theoretical framework for this study is that of social constructivism. Social constructivist theories are based on the assumptions that a) knowledge is constructed by the interaction of the individual with the social/cultural environment, b) higher mental functions are social cultural in nature, and c) knowledgeable members of the culture can assist others in learning (McCarthey & Raphael, 1989).

Social constructivists pay attention to the collective act, that act being the interaction between participants in the learning event. Bruffee (1984) maintains that thought is an artifact of milieu, or restated, an outcome of the communication between members of the classroom. Social construction takes individual private purpose and makes it public and interactive.

Mehan's (1981) theory of social constructivism emphasizes that the development of cognitive processes occurs within the individual through the internalization of interactions between learners and more capable teachers. This approach demonstrates that ability and intelligence are not static, but are dynamic, collaborated responses to specific interactions, interactions observed between student and student and student and teacher. The theory states that cognitive and social structures are composed and reside in the interaction between people and emphasizes that knowledge is gained within an instructional and social setting rather than being internally organized (Mehan, 1981). Success or failure in schools, therefore, may be due to matches or mismatches between teachers and student or schools and homes. These matches or mismatches are especially important since so many school failures are members of a defined at-risk population. Changing these patterns of failure among the at-risk groups of children may indicate a need to modify the social interaction systems at work within classrooms. Interactions between students and teachers and student self-esteem and
concomitant academic achievement must be studied to discover how they impact success within the specific multi-age context.

Social constructivism may significantly broaden researchers' and practitioners' understanding of what occurs during classroom interactions. If "both ability and disability can be understood in terms of the social environments in which they occur" and intelligence and concomitant achievement is a "dynamic, mutually constitutive and reflexive relation between individual and environment" (Mehan, 1981, p. 76) then researchers and practitioners must look beyond the individual student to explain why some students appear to learn faster or better in some contexts than others.

Focusing on curriculum, Goodson (1990) builds a case for grounding research in social constructivism, "We need an understanding of how curriculum prescriptions are in fact socially constructed for use in schools ... a focus on the construction of prescriptive curricula and policy coupled with an analysis of the negotiations and realization of that prescribed curriculum. We need to understand social construction of curricula at the levels of prescription and process and practice" (Goodson, 1990, p.305). For the purposes of this study, prescription and process embodied in multi-age grouping philosophy and practice as observed through interactions between students and teachers will be the focus.

To understand the interaction of the individual with the social environment, a cumulative understanding of the historical contexts in which the contemporary curriculum is embedded is necessary (Goodson, 1990). Succinctly summarized by Stenhouse in Goodson (1990), "It is, as it were, the story of action within a theory of context" (p.4). The story of interactions between students and students, students and teachers, and academic growth within the context of multi-age grouping is the action as defined through the Accelerated Schools process. Social constructivist perspectives seek a reintegrated focus for studies of curriculum by moving away from a singular focus, towards developing data on social construction at both preactive (e.g., Accelerated Schools process) and interactive (e.g., multi-age grouping) contextual levels (Goodson, 1990).
Section Two: Multi-age Grouping

Background

"Public education is on the verge of total irrelevancy. As we struggle through intragenerational disjunction, as we increasingly recognize the inability of our senses to comprehend the realities of technology, as the fear within us grows that technology has already escaped the kinds of control available to a democratic society, statehouses and legislating lists of performance objectives designed to hold teachers and students alike accountable for competencies that are, and were even in the past, trivial; textbook companies add to the trivias as they continue to push for a return to the basics, meaning of course, reading, writing, and arithmetic packaged between a pair of hard covers; and school administrators continue to accept the models of business and industry to guide school operations as though schools were part of a free enterprise system having discrete products as outcomes." (Longstreet, 1979, p.8)

The evolution of our society from an industrial to informational age can no longer support educational institutions that view student learning as assembly-line-type products. Our diverse, pluralistic society requires a flexible educational system that is able to meet the needs of all students. Developing ways to adapt school learning experiences to individual differences in students has long been a concern for educational researchers and practitioners. Research literature on both the extent of variation among students and the need for adapting school organization and instruction to individual differences in students goes back well over 100 years (Washburne, 1925 as cited in Meyer, 1988). This recognition has resulted in sustained and growing interest in developing educational programs that adapt school learning to the different abilities, experiences, interests, and socio-economic backgrounds of children (Wang, 1990). One such program is that of multi-age grouping.

With the beginning of the nineteenth century, schools that existed served only a small fraction of children, usually males headed for religious careers. The curriculum focused on religious training and literacy was mostly a family responsibility (Anderson & Pavan, 1993). By mid-century, however, urbanization and industrialization had created a dramatic need for expansion of schools at a cost shared among taxpayers. The earliest of these schools
accepted children of all ages, and it was not unusual to see three-and four-year-olds in the same classroom as teenagers (Angus & Vinouskis, 1988). Goodlad and Anderson (1987) pointed out that there were a number of efforts to establish a more orderly and regimented structure, of which new textbooks including the McGuffey Eclectic Readers (after 1836) and the English monitory system were prime examples. There was a rather steady progression toward classifying young people and providing them with progressively more difficult materials of instruction. By mid-century, therefore, the stage had already been set for the formal adoption of full-fledged graded schools (Anderson & Pavan, 1993).

The person usually associated with graded schools is Horace Mann of Massachusetts, whose advocacy of graded structure was fueled by its apparent success in Germany. The famous Quincy Grammar School in Boston, founded in 1848, became not the first but by far the most remarkable example, after which thousands of elementary schools were patterned. The building, unusual for its day, was four stories high. Each teacher had a separate room, with a single age class. Pupils were sorted in grades of like achievement and they either passed or failed at the end of the year (Goodlad & Anderson, 1987). Those unfortunate enough to fail, were kept back at the previous level and instructed in the same curriculum (Levin & Hopfenberg, 1987) rather than beginning instruction at the student's level of comprehension. Single age classrooms did not have the flexibility to allow for students to progress along a continuum of learning. Content, course syllabi, and the calendar controlled the decision as to when mastery of learning occurred as opposed to student readiness.

Goodlad and Anderson (1987) discuss this continuum of learning in relationship to present day curriculum organization, through their concept of a longitudinal view of curriculum. Grade to grade classifications and pupil progress are vertical considerations. If one places these views of pupil progress and school organization side by side with vertical curriculum organization, one would have a longitudinal look at a school program. "This longitudinal view is essential to a continuous, unbroken learning process in which what is learned at one point builds on what has gone before and prepares for what is to come. But
such a view is difficult to achieve when children are thought of as fifth-graders, when the school is divided into grades, and when what is to be taught is packaged for consumption according to these grade-level demarcations" (Goodlad & Anderson, 1987, p. 80). When one thinks only in terms of a specific grade assignment with specific grade-level content that must be consumed in a finite period of time, one loses sight of the student as an individual, an individual who possesses unique learning needs that must translate to specific instructional strategies, that will facilitate continuous progress along a learning continuum. The substance of the desired curriculum, continue Goodlad and Anderson, should be organized around the elements of learner behavior sought and the areas of content to be used in developing such behavior. Learner behavior becomes more complex when examined not only by the desired outcome, but by the maturity or developmental appropriateness (NAEYC, 1986) of the content to the learner. Goodlad and Anderson (1987) provide another verifying example of this learner behavior, "When we examine a file like reading which has no content of its own ... sequence is planned both by identifying the psychomotor skills that constitute the reading act and by analyzing the complexity of these skills as they should mature in the learner" (p. 80).

It becomes apparent, then, that curriculum, the plans that guide learning in schools (Glatthorn, 1987), should allow for continuous progress of students along a developmentally appropriate continuum. This review will address those curricular components surrounding learning in a later section. We will continue, at this point, to review the elements unique to a multi-age classroom.

**Grouping Patterns**

The most obvious differences between multi-age and single grade classrooms are the grouping patterns of students. As an identified difference, this section will attempt to discern the importance of this alternative grouping pattern to academic growth through the review of literature.
A best-evidence synthesis of research studies on ability grouping and elementary school academic achievement was compiled by Slavin (1987). In order to look only at the effects of ability grouping compared to heterogeneous grouping using standard instructional practice, he excluded studies that included gifted or special education classes, non-graded or multi-age programs, open classrooms, team teaching, and instructional practices such as cooperative learning, continuous progress-instruction, individualized instruction, and mastery learning. Median effect size of .00 was found when students were assigned to self-contained classes on the basis of ability. Cross-graded ability grouping for reading (Joplin Plan) provided a median effect of +.45, and within-class ability grouping in mathematics yielded an effect size of .4 (Slavin, 1987). Based on this study and including the research on non-grading reviewed in 1986, he made the following suggestions:

1. Students are assigned to heterogeneous classrooms for all subjects except some reading and mathematics lessons, where similar performance levels are required.

2. Regrouping for homogeneity is for teaching specific skills only.

3. These small groups will be assessed frequently so that students no longer needing the instruction will be assigned to different groups.

4. Teachers need to use different instructional techniques based on the specific skill and group taught (Slavin, 1987).

This study suggests that heterogeneous grouping for initial class organization is appropriate. It also implies that when ability grouping is utilized within classrooms, frequent assessment must occur to assure appropriate movement between groups.

A survey of all research studies comparing non-graded and graded elementary schools between 1968 and 1971 was compiled by Pavan in 1973 and is summarized here in Table One. Fifty-seven of the studies used standardized achievement tests to compare graded and non-graded schools. Only nine of the ninety-four comparisons favored the graded school. All others either favored the non-graded school or indicated no statistically significant differences between groups (Anderson & Pavan, 1993).
Table One: Percentage of studies favoring non-graded programs over graded programs.

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<thead>
<tr>
<th></th>
<th>Better</th>
<th>Same</th>
<th>Worse</th>
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<tbody>
<tr>
<td>Academic Achievement</td>
<td>58%</td>
<td>33%</td>
<td>9%</td>
</tr>
<tr>
<td>Mental Health</td>
<td>52%</td>
<td>43%</td>
<td>5%</td>
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These studies provide evidence that in heterogeneous, multi-age classrooms and schools students perform as well or better than students in traditional settings. They fail, however, to examine the influence of specific instructional strategies within this same context on academic achievement of students over time. This study will attempt to fill that gap by focusing on the instructional strategies utilized within this context, influences of student and teacher interactions on instructional practices, and the influence of both on the academic achievement of students over time.

Section Three: Instructional Strategies

"Over the years we have been presented with all kinds of learning principles and theories which were considered basic for understanding human social behavior. In fact, since almost every school teacher has been required in his training to take a course in learning, he was exposed to ideas based almost exclusively on the learning of individual rats. Nobody has ever demonstrated in anything resembling a compelling manner that these principles and theories were or are relevant to learning in the social matrix of a classroom." (Sarason, 1972)

Brain Research

Learning is the function of the brain. Before one can examine the instructional strategies in a multi-age context, an exploration of the literature reviewing the functions of the brain, the organ of learning, the link to learning, is imperative.

Caine and Caine (1991), in their review of brain research, suggest notions regarding how the human brain learns. They are:

1. Intelligence is a function of experience rather than immutable genetics.
2. The mind is a pattern-seeking device; it is not logical or sequential in the way it takes in and makes meaning of input.

3. The brain is not a passive consumer of information. It actively constructs its own interpretations of information and draws inferences from it.

4. Most information that we use is embedded in programs, a planned sequence to accomplish a purpose or goal; information not embedded in programs is generally unretrievable and thus unusable.

Frank Smith (1990) synthesizes these findings, "The view is current, in scientific research and popular educational theorizing, that the brain is an information-processing device, functioning only under the press of immediate circumstances to seek, organize, retrieve, and utilize information. Learning is regarded as the acquisition of information, memory, its recovery; and thinking its manipulation .... Knowledge is a by-product of experience, and experience is what thinking makes possible" (p.12).

These findings of brain research led to one of the current reforms in education, teaching for understanding or, constructivism. Constructivists state that learning is understood as a self-regulated process of resolving inner cognitive conflicts that often become apparent through concrete experience, collaborative discourse, and reflection (Brooks & Brooks, 1993). Students learn not only the individual elements in a specific content area, but also the connections among them. The understanding of these connections allows students to explain the content in their own words and access and use the content information in appropriate application situations in and out of school (Bereiter & Scardamalia, 1987; Brophy, 1989; Glaser, 1984; Prawat, 1989; Resnick, 1987).

The role of teacher and resultant instructional strategies are equally as important as our understanding of the role of student (section four) in stimulating student learning from a constructivist approach. This understanding of student learning has been influenced by developmental and cognitive psychologists who hold constructivist views of learning and teaching (Davis, Maher, & Noddings, 1990; Resnick & Klopfer, 1989; Steffe, Cobb, & von
These constructivists again state the need for a process of instruction that involves making connections between new information and existing networks of prior knowledge. Students must elaborate and question what they are told, examine the new content in relation to more familiar content, and build new knowledge structures (Resnick & Klopfer, 1989). Otherwise, the knowledge may be recallable when cued by questions or test items but not applicable in everyday living (Good & Brophy, 1994).

Constructivists differ in their ideas about the nature of knowledge. Empirically oriented constructivists believe that knowledge is anchored in the external environment and exists independently of the learner's cognitive activities, so they tend to speak about helping learners to construct accurate conceptions (Case, 1982; Ginsburn & Opper, 1979; Rumelhart & Norman, 1981 as cited in Good and Brophy, 1994). In contrast, radical constructivists believe that knowledge resides only in the constructions of learners. Teachers, therefore, cannot teach precise interpretations of truth, but can only construct useful understandings by overcoming obstacles or contradictions that arise as they take part in purposeful activity (Cobb, 1986; Cobb, Yackel, & Wood, 1992; von Glassersfeld, 1984 as cited in Good and Brophy, 1994).

Construction of knowledge is smoother when learners can address new content in the context of relating it to existing background knowledge or experiences (Good & Brophy, 1994). New content is not first understood in an abstract way and later related to existing knowledge. Rather, it is interpreted from the beginning within contexts implied by that existing knowledge (Good & Brophy, 1994). Collections of prior knowledge that provide contexts for meaningful interpretation of new content are usually called schemas (Anderson, 1984; diSibio, 1982).

Social constructivists (See Section One) emphasize, "... teaching that features sustained dialogue or discussion in which participants pursue a topic in depth, exchanging views and negotiating meanings and implications as they explore its ramifications" (Good &
Brophy, 1994, p. 419). Good and Brophy (1994) summarize these key features of social constructivists' approaches to teaching and learning in Table Two.
Table Two: Teaching and Learning as Transmissions of Information Versus as Social Construction of Knowledge

<table>
<thead>
<tr>
<th>Transmission view</th>
<th>Social construction view</th>
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<tbody>
<tr>
<td>Knowledge as fixed body of information transmitted from teacher or text to students</td>
<td>Knowledge as developing interpretations co-constructed through discussion</td>
</tr>
<tr>
<td>Texts, teacher as authoritative sources of expert knowledge to which students defer</td>
<td>Authority for constructed knowledge resides in the arguments and evidence cited in its support by students as well as by texts or teacher; everyone has expertise to contribute</td>
</tr>
<tr>
<td>Teacher is responsible for managing students' learning by providing information and leading students through activities and assignments</td>
<td>Teacher and students share responsibility for initiating and guiding learning efforts</td>
</tr>
<tr>
<td>Teacher explains, checks for understanding, and judges correctness of students' responses</td>
<td>Teacher acts as discussion leader who poses questions, seeks clarifications, promotes dialogue, helps group recognize areas of consensus and of continuing disagreement</td>
</tr>
<tr>
<td>Students memorize or replicate what has been explained or modeled</td>
<td>Students strive to make sense of new input by relating it to their prior knowledge and by collaborating in dialogue with others to construct shared understandings</td>
</tr>
<tr>
<td>Discourse emphasizes drill and recitation in response to convergent questions; focus is on eliciting correct answers</td>
<td>Discourse emphasizes reflective discussion of networks of connected knowledge; questions are more divergent but designed to develop understanding of the powerful ideas that anchor these networks; focus is on eliciting students' thinking</td>
</tr>
<tr>
<td>Activities emphasize replication of models or applications that require following step-by-step algorithms</td>
<td>Activities emphasize applications to authentic issues and problems that require higher-order thinking</td>
</tr>
<tr>
<td>Students work mostly alone, practicing what has been transmitted to them in order to prepare themselves to compete for rewards by reproducing it on demand</td>
<td>Students collaborate by acting as a learning community that constructs shared understandings through sustained dialogue</td>
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</tbody>
</table>
Ideas about teaching in the zone of proximal development (see Section One) are important to consider to provide the necessary link to the theoretical framework of social constructivism. These ideas tend to cluster around the notions of scaffolding and gradual transfer of responsibility for managing learning from the teacher to the student. Instructional scaffolding is a general term for the task assistance or simplification strategies that teachers might use to bridge the gap between what students are capable of doing on their own and what they are capable of doing with help. Scaffolds are forms of support provided by the teacher (or another student) to help students progress from their current abilities to the intended goal (Rosenshine & Meister, 1992).

Closely associated with the concept of scaffolding is that of gradual transfer of responsibility for managing learning (Good & Brophy, 1994). As students develop expertise in a given area, they begin to assume responsibility for their own learning by asking questions and working on more complex tasks with a great degree of autonomy.

Tharp and Gallimore (1988) described a model of assisted performance that identified six means of providing responsive assistance:

1. Modeling, especially cognitive modeling that includes overt verbalization of strategies.
2. Contingency management, especially praise of good performance.
3. Providing feedback about the correctness of responses.
4. Instructing -- telling the student specifically what to do, to be used sparingly.
5. Questioning, to simulate the student to think and communicate about the task, especially if this will produce mental operations that might not be produced otherwise.
6. Cognitive structuring -- stating principles or generalizations that pull things together and make for better organized representation of the learning.

The emphasis is on patience and on allowing learners to handle as much as they can on their own and to learn through their mistakes, except where mistakes might be costly or
dangerous and thus must be minimized through more direct and controlling forms of instruction (Good & Brophy, 1994).

In discussing what is involved in teaching that is based on brain research and is based on a constructivist theory, concentration has been on generic aspects that cut across the various school subjects. The following sub-sections will present reviews that describe how these principles have been embodied in particular subject areas.

Reading

The report *Becoming a Nation of Readers* (Anderson, R., Heibert, E., Scott, J., & Wilkinson, I., 1985) integrates research-based principles for teaching reading for understanding. This report calls for teaching reading as a sense-making process of extracting meaning from texts that are read for information or enjoyment. The emphasis, then, is on reading and interpreting text rather than on practicing fragmented skills. Skills, such as decoding, blending, and noting main ideas are taught, but this instruction is done within the context of reading for meaning.

These instructional strategies are often referred to as Whole Language (Goodman, 1986). In *Becoming a Whole Language School: The Fair Oaks Story* (1989), a case study chronicles a school transitioning from a traditional, basal-reader approach to the holistic approach described previously. Data gathered over an eight year period revealed that CTBS (California Test of Basic Skills) test scores for students had increased three to four years resulting in the student population scoring at or close to grade level (Bird, 1989). Teachers who had been at Fair Oaks ten years or more reported, "Definite improvement in student attitudes toward reading and writing and toward school-related activities in general" (Bird, 1989, p. x).

These same principles, teaching skills within a holistic context and reading for enjoyment, were developed to meet the needs of native Hawaiian children who previously had difficulty learning to read, (Project KEEP, Au, 1985) as well as the Reading Recovery
program (Anderson & Armbruster, 1990; Pinnell, DeFord, & Lyons, 1988) that has been used successfully with first graders who have failed to learn to read when taught by traditional methods.

Writing

When writing is taught for understanding and application, the instructional goals focus on teaching students to use writing for organizing and communicating their thinking to specific audiences for specific purposes (Good & Brophy, 1994).

Goodman (1986) notes the strong connection between reading and writing, and indicates that a literacy program should focus on the meaning of language in authentic events, rather than by slicing language into isolated skills to be mastered before children actually read and write. Graves (1985) suggests four components necessary for a writing-process program: sufficient time to write, writing topic chosen by the child, teacher-student dialogues about the child's writing, and a classroom atmosphere that fosters writing.

With a teaching for understanding, or constructivist emphasis, basic skills such as printing and cursive writing are taught explicitly and practiced to mastery, but a great deal of this practice is embedded within writing activities that call for communication of meaningful content. "Authentic" writing that is intended to be read for meaning and response is emphasized (Applebee, 1986; Bereiter & Scardamalia, 1987; Calkins, 1986; Florio-Ruane & Lensmire, 1989; Graves, 1983; Rosaen, 1989).

Mathematics

The National Council for Teachers of Mathematics (NCTM, 1989) has issued a standards and evaluation document calling for goals to focus on developing students' mathematical power. This term refers to students' abilities to explore, conjecture, and reason logically, as well as to use a variety of mathematical models effectively to solve non-routine problems. Problem solving, concept development, and the construction of learner-generated
solutions and algorithms are given more importance than memorizing procedures and using them to get right answers (NCTM, 1989).

One experimental approach that embodies many of these principles is Cognitively Guided Instruction (CGI), developed by Fenneman, Carpenter, and Peterson (1989) for increasing primary grade teachers' effectiveness in introducing young children to mathematics. The emphasis is placed on word problems that apply to students' current lives, and teachers foster discussion of students' own invented strategies for solving such problems. Evaluation data have revealed that students in CGI classrooms showed significant advantages in problem solving and mathematical confidence compared to students in control classrooms, with no loss in computation skills (Fenneman, Carpenter, Peterson, 1989).

Two other approaches to introducing mathematics in primary grades feature similar philosophies and results. Heibert and Wearne (1992) used methods reflecting the National Council of Teachers of Mathematics guidelines (1989). Compared with students who were taught the same content using more traditional methods, the experimental students showed more understanding of key concepts and ability to apply the strategies they had learned (Good & Brophy, 1994).

Lampert (1989) and Soled (1990) have achieved similar results with intermediate students. Within limits, the gains in understanding, appreciation, and application of skills can be achieved through instruction that emphasizes authentic applications over isolated skills practice without a corresponding reduction in skills development (Good & Brophy, 1994).

Science

The National Science Foundation (NSF) has also called for reform based on hands-on experimentation and learner-generated questions, investigations, hypotheses and models (NSF, 1992), constructivist tenants based on brain compatible (Hart, 1983) constructs.

Recent trends in science education have placed greater emphasis on eliciting students' prior knowledge and then developing the topics through social constructivist teaching (Good
& Brophy, 1994). Much has been researched about the kinds of misconceptions that students develop in science (Glynn, Yeany, & Britton, 1991) and about addressing these misconceptions through conceptual change teaching (Roth, 1990).

**Cooperative Learning**

Cooperative learning (Johnson & Johnson, 1990; Kagan, 1989), which crosses all subject areas, is viewed as an important thrust in curriculum reform, encouraging the construction of knowledge through small group interaction and cooperation. Cooperative groups commonly consist of three to four students who work together for a common purpose for a variety of reasons; to increase motivation, improve social skills, or acquire a skill or concept (Johnson & Johnson, 1989; Kagan, 1989).

Dewey was one of the first to emphasize this strategy by insisting that learning should be active, with students participating in a variety of activities "...requiring natural divisions of labor, selection of leaders and followers, mutual cooperation and emulation." This interaction should lead to "the development of a spirit of social cooperation and community" (Dewey, 1956, p. 14-16).

Johnson's and Johnson's (1989) strategies of cooperative learning teach students specific social skills and subsequent demonstration of these skills earns groups their points. It is an instructional strategy that may be used with any content area. Kagan (1989) has described his team structures, which one might call instructional strategies or techniques, as curriculum-free. Cohen (1989) indicates that while cooperative learning leads to increased academic achievement "in academically, linguistically, culturally diverse classrooms, caution must be taken so that high achieving students do not dominate the team" (p. 134).

**Integrated Instruction**

Integration of subject matter and content and learning skills under broad themes that reflect issues of significance and interest to children are utilized in multi-age classrooms. Hidi
(1990) reviewed recent research on reading and stated that "individuals interested in a task or activity have been shown to pay more attention, persist for longer periods of time, and acquire more and qualitatively different knowledge than individuals without such interest" (p. 554). Interest may be developed through the application of a theme that unifies content areas.

Caine and Caine (1991) in their review of brain research, suggest that brain-based schooling would use thematic units in which, "the teachers are models of related alertness orchestrating immersion of students in their activities to then be followed by student reflections" (p.14). Essential to the process are the connections or wholeness of the learning experiences.

Kovalic and Associates (1991) developed the Integrated Thematic Instruction (ITI) model as a way of conceptualizing what is known from brain research and its implications for curriculum development and instructional strategies. The environment requires the key elements of trust, meaningful content, enriched environment, choices, immediate feedback, and adequate time for mastery/competence. The instructional strategies include cooperative learning, balanced direct and guided learning, questioning strategies that support acquisition of natural knowledge, classroom management and use of multiple resources. "As a conceptual model for teaching, Integrated Thematic Instruction provides a structure which will 'hook' the parts and pieces of 'good teaching' .... into a holistic context."

Section Four: The at-risk student: Interactions between students and teachers and that influence on academic achievement

"I am convinced we are allowing social dynamite to accumulate in our large cities. I am [concerned] about the plight of parents ...whose children either drop out or graduate from school without prospects of either further education or employment...Leaving aside human tragedies, I submit that a continuation of this situation is a menace to the social and political health of large cities."(Conant, 1961)
The at-risk student, as defined in the Accelerated Schools literature (1991) can be identified when there is a mis-match between the educational setting and student needs. The educational setting within the context of multi-age includes frequent interactions between students and students and students and teachers. These interactions transcend two domains; the affective and the cognitive. The following section presents a review as it relates to at-risk students' perceptions of teacher's acceptance, those same students' perceptions of acceptance by their peers, and the types of interactions that may influence academic achievement (e.g., competition, talk in the classroom, peer tutoring).

Through the implementation of these instructional strategies the teacher may often assume the role of facilitator and instruction may be delivered by students. Aspects critical to the success of these roles appear to be that of interactions between teacher and students and the type of talk in which teachers and students engage. The following section defines the student (at-risk), the needs that influence social interactions (teacher acceptance and student acceptance) and the social organization of talk (relationships between delivery style and level of student and teacher participation).

At-Risk

The students to be observed in this study are considered at-risk. There are two categories of circumstances that put students at high risk. First, there are primary risk factors that are beyond the control of the student. These may include race, family income, place of residence, family composition, abuse or emotional or physical neglect, illness, a handicapping condition, inappropriate education, or unfair treatment. The secondary risk factors that exist are due to choices made by the student. These include truancy, chronic disciplinary problems, teenage pregnancy, school failure, violation of the law, and marriage (Mizell, 1990). The elementary students in this study qualify as at-risk as defined by the primary factors; family income, place of residence, abuse or emotional or physical neglect, or a handicapping condition.
National studies have found that dropouts are more likely to be students from low-income families; those who are two or more years behind grade level and those with behavior problems, low grades, and parents with low educational aspirations (Mizell, 1990). Very few children actually drop out of elementary school, but most educators assert that they can identify at an early age the students who are most likely to have trouble coping with the academic and behavior expectations of the public schools. Students' inabilities to successfully respond to these expectations often cause them to drop out of school early. Some of these problems can be alleviated simply by the caring and attention of a skilled teacher, or by programs which strengthen a student's self-concept or relationships with his or her peers (Mizell, 1990).

The literature on at-risk students (Arnold, 1983; Dramer, 1988; Newman, 1981) suggests several conditions that underlie at-risk behaviors: academic underachievement, lack of self-esteem and self-respect, inability to communicate thought and feeling on an intimate level, limited conflict resolution and problem-solving skills, and unrealistic life expectations. Teachers commonly accept the first two conditions and find them perpetually challenging. Preoccupied with matters directly related to their teaching areas, they are less sensitive to the latter three conditions (Rogus & Woldenhaus, 1991).

At-risk students' inability to communicate on an intimate level signifies a difficulty in expressing themselves on personal matters such as joy, hope, fear, and disappointment. They tend to distance themselves from those whose questions come too close, with their desire for space often being misinterpreted as unruliness or disrespect and preventing social interactions in the classroom.

Limited problem-solving and conflict resolution skills suggest that at-risk students commonly employ classic flight or fight behavior in response to challenges (Mizell, 1990). While this reaction may provide immediate personal relief or satisfaction, it also commonly creates new problems that affect both achievement and self-concept and could limit collaboration.
Unrealistic life expectations studies (Mizell, 1990) imply that at-risk youngsters commonly demand so much or so little of themselves that they frequently experience deep disappointment in what life offers. This disappointment has an interactive effect on the other conditions that are associated with at-risk. The disappointment of perceived failure to meet expectations set by self or others, compounded by poor living conditions may result in a student who feels embarrassed and isolated. This embarrassment and isolation may foster inhibition and a reduction in communication and interaction with others.

Teacher Acceptance

Intuitively, we know that learning is inhibited if students do not feel accepted by the teacher and by their peers. Researchers confirm the importance of a sense of acceptance. Good and his colleagues (Good, 1982; Good & Brophy, 1982) have illustrated the importance of students' perceptions of their acceptance by the teacher. Similarly, for decades, Combs (1962, 1982) has championed the importance of students' perceptions of their acceptance.

The research in this area indicates that teachers help students feel accepted in the classroom through seemingly trivial yet very important behaviors; an approving glance, a smile, a pat on the back. Much of the work of Hunter, Schmidt, and Jackson (1982), and the techniques presented by Kerman, Kimball, and Martin (1980) in their Teacher Expectations and Student Achievement (TESA) program deal with activities that enhance students' perceptions of their acceptance. The TESA program points out that a teacher can foster students' sense of acceptance in many ways: (a) by making eye contact with each student in the class, being sure to pay attention to all quadrants of the classroom, (b) by calling all students by the first or preferred name, (c) by deliberately moving toward and staying close to learners, and (d) by touching students in appropriate and acceptable ways.
Students need to feel accepted by their classmates as well as by their teacher. According to Slavin (1987), research on the utility of cooperative learning was already well developed by the 1920s. From his review of the literature, Slavin concluded that the positive effects of cooperative learning on academic performance are not well established, but its effectiveness in fostering acceptance and understanding among the members of a group is undeniable.

Cooperative learning is not the only way to nurture student’s sense of acceptance. Based on his theories of psychotherapy, Glaser (1981) devised the classroom meeting, a period of thirty to forty-five minutes during which students and teachers set aside their normal academic activities to engage in non-judgmental discussions of personal, behavioral, or academic problems in an effort to find collective solutions. In their discussion of Glasser’s model, Joyce and Weil (1986) focus on the social problem-solving meeting, which is usually concerned with behavioral and social problems. It is the group dynamics in such meetings that generate a sense of acceptance among members. The following quote demonstrates the focus of these meetings:

"The orientation of the meeting is always positive—that is, toward a solution rather than toward fault finding. Obviously, many problems do not have a single answer. For example, in the case of coping with a bully, the solution is often in the class discussion itself" (Joyce & Weil 1986, p. 207).

The perceived value of tasks is probably the most important to the learner’s success. Current research and theory on motivation (McCombs 1984, 1987; Schunk, 1990) indicate that learners are motivated most when they believe the tasks they are involved in are relevant to their personal goals. Glaser (1981) and Powers (1973) hypothesize that human beings operate from a hierarchical structure of needs and goals; they must satisfy basic physical needs (e.g., food, shelter) and psychological needs (e.g., acceptance, safety) before being able to form goals—to decide what they are "consciously trying to accomplish" (Schunk, 1990,
From this perspective, working to develop a positive mental climate, focuses on meeting students' psychological needs. A growing body of research indicates that when students are working on goals they have set, they are more motivated and efficient, and they achieve more than they do when working to meet goals set by the teacher (Horn & Murphy, 1985; Schunk, 1985). This research strongly implies that if educators expect students to be motivated to succeed at classroom tasks, they must somehow link those tasks to student goals. Some powerful ways of doing this include allowing students to structure tasks around their interests, allowing students to control specific aspects of tasks, and tapping the students' natural curiosity.

Social Organization of Talk

Rubin (1990) defines talk through various categories. One simple way to categorize types of talk is by describing the range of audiences with whom we can interact. In the past, typical classroom communication tended to rely on public communication models. Teachers talked, students listened -- or if they did not listen -- at least they did not talk. Teacher-centered instruction gave students little turn-taking power.

Large-scale observational studies (Cazden, 1988) in both the United Kingdom and the United States show the prevailing picture. Even if seating in groups has replaced seating in rows, only the seating has been socialized, not the work. In both countries, two kinds of social organization seem to predominate, at least in elementary classrooms:

1. Traditional large-group instruction, with teacher in control at the front of the room.
2. Individualized instruction, with children working alone on assigned tasks, and the teacher monitoring and checking their individual progress either at a student's desk or the teacher's desk.

Discussions of the role of social interaction in the development of cognition, learning, and knowledge often do not explicitly distinguish between interactions with experts (those who understand more about the particular matter at hand) and interactions with peers (other
learners of generally equivalent understanding). Vygotsky, in his definition of the zone of proximal development, speaks of both adults and more capable peers. "The zone of proximal development is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, cited in Cazden, 1988, p. 30).

Piaget's writings also display the same lack of explicit contrast, but an opposite emphasis on interactions with peers seems to be assumed. To Piaget, social interaction is an essential antidote to egocentrism; in the confrontation with alternative points of view one is stimulated to consider one's own limitations (Cazden, 1988).

Cazden (1988) continues to report the importance to Vygotsky of interactions with experts (adult or child) and to Piaget of interactions with peers, which form their contrasting beliefs about how external talk affects internal thought. To Vygotsky, thought - or inner speech - clearly reflects its social origins in two senses of the word social: in its origin in interaction and its use of culturally organized symbolic systems, especially language. To Piaget, "Social interaction is important because of the cognitive conflict it stimulates; talk is a catalyst for internal change without direct influence on the forms and functions of thought" (Cazden, 1988, p. 126).

Cazden (1988) suggests four potential cognitive benefits of discourse (language) among peers: discourse as catalyst, as the enactment of complementary roles, as relationship with an audience, and as exploratory talk instead of final draft. A discussion of each of these benefits suggests an identification of categories of student talk that may result in clarifying the interactions between students and students and teachers and students in this study.

In her Discourse as Catalyst, Cazden states that empirical support for the cognitive value of collaboration among school-age children comes from a series of training studies by a group of Genevan psychologists (Perret-Clermont, 1980). They examine the effects of peer collaboration on logical reasoning skills associated with the Piagetian stage of concrete
Perret-Clermont concludes from this body of work that peer interaction enhances the development of logical reasoning through a process of active cognitive reorganization induced by cognitive conflict.

Discourse as the enactment of complementary roles was described by Cazden in her review of Forman's doctoral thesis (1981). "In Forman's words, 'In tasks where experimental evidence was being generated and where managerial skills were required, by assuming complementary problem-solving roles, peers could perform tasks together before they could perform them alone. The peer observer seemed to provide some of the same kinds of 'scaffolding' assistance that others have attributed to the adult in teaching contexts’" (Cazden, 1988, p. 130).

Discourse as relationship with an audience is best described by Heap (1986) through his orientation to others. Orientation to others is achieved in speech by the availability of immediate feedback when something said is unclear. It includes reciprocal roles of students where the teacher may or may not have modeled the role for the helper to enact (Cazden, 1988).

Discourse as exploratory talk represents an important dimension of linguistic interactions among students in that it allows the process of learning without the answers fully intact (Cazden, 1988). Barnes (1976) reports that this exploratory talk will occur if the teacher is a participant but is most likely to occur in discussions that are only among peers. Critical to Barnes' argument is that exploratory small-group talk "both strengthens class discussion and supports forms of learning which take place less readily in full class" (Barnes, 1976, p. 200).

Teachers are not the only source of variation in a child's experience within a single classroom. That children have different experiences with their peers, whether the help is spontaneous or assigned by the teacher is proposed in an alternative model by Rubin (1990). In this model, students participate in the full spectrum of interaction roles. Teachers do not hold exclusive gate keeping power over speaking rights. Students participate in decisions
regarding who gets to talk and in what direction lessons develop. Collaborative projects and activities result in classrooms in which students engage in a great deal of small group communication. At any given time, students can be found working with their peers in finding, defining, and solving their own learning challenges. The teacher's role becomes one of consultant, facilitator, or coach. This alternative model of shared classroom talk allows students and teachers to mutually negotiate their curriculum.

Developmental psychologist Cooper (1982) and her colleagues conducted a series of studies on spontaneous helping in a second grade where it was not considered cheating and was even encouraged. Contrary to the researchers' expectations, academic ability was not the only important variable which influenced students to seek out peer experts. Two children in this second-grade class were performing at the sixth-grade level, but only one of them was sought as a consultant.

In one study of interaction in nine bilingual classrooms, grades two through four, groups were assigned challenging math and science tasks for an hour a day for fifteen weeks (Cohen, 1989). Each child was expected to complete individual work, but all the children were encouraged to ask each other for help, and were expected to give help when asked. The materials were in both English and Spanish, and the teachers used both languages, so students not yet proficient in English were at no disadvantage. The status of students as perceived by their peers was measured from a sociometric interview at the beginning of the year; rate of interaction was obtained from observations of the working groups; and learning was measured by tests of the curriculum content at the beginning and end of the curriculum unit.

In these classes, the rate of talking and working together was most closely related to the children's perceptions of which classmates were best at math and science, but it was also related to their perceptions of their peers' reading ability and to close friendships. Children who interacted the most were also the ones who learned most, especially about the more complex concepts. "Those children with high social status have more access to peer
interaction that, in turn, assists their learning. In other words, the rich get richer" (Cohen, 1989, p.73).

In a study that complements Cooper's, Garnica (1981) compared the interactions of six kindergarten children who were at the bottom of the sociometric scale, called omega children, with six children chosen randomly. Twenty minute speech samples were analyzed for each of the 12 children. The quantitative analysis showed a significant difference between the omega children and the others on all measures except the number of insults. The omega children were isolated and verbally neglected; they talked far more to themselves, and it appears from the qualitative analysis that they did not receive more insults and taunts simply because they rarely tried to step out of or challenge their neglected status. "If informal helping is important, then we need to understand not only the situations in which it works well but also how to change the status of isolated children" (Garnica, 1981, p.66).

The conditions that underlie at-risk behavior, specifically academic underachievement and inability to communicate thought and feeling, were addressed in this review. In cognitive attributions, self-worth and basic needs theories, the importance of self-perceptions (worth and adequacy) and their relationship to academic success were also addressed. Status of the child within the classroom context provided additional insight into possible interactions that may increase student success. These aspects of self-perception and classroom status have particularly strong implications for the at-risk child in that these children frequently suffer from low self-esteem (Cuban, 1989) and may therefore perceive themselves as low-status. Finally, types of classroom talk suggested evidence of the importance of interactions between students and students, and students and teachers to the learning event. These studies fail, however, to examine any of these factors in the multi-age context. This study will attempt to add to the body of research by addressing the interactions between at-risk students and students and at-risk students and their teachers and their influence on academic growth.
Section Five: Accelerated Schools

"Imagine a school in which all children perform at or above grade level, regardless of their background or family situation. Imagine a school that treats all children as gifted and talented students... Imagine a school in which members develop a vision of the kind of school that they would want for their own children, work toward that dream, and achieve it... Imagine a school where ideas count, where students, staff, and parents work together in an exciting environment. Let your imagination go as far as it will, and you've discovered the accelerated schools" (Hopfenberg, Levin, & Associates, 1991, p. 1).

The Accelerated Schools movement is a process implemented to address the needs of disadvantaged youths directly, rather than assuming that raising general standards will meet the needs of all students (Levin, 1987). The Accelerated Schools movement is a comprehensive approach to accelerate the learning of at-risk students so that "they are able to perform at grade level by the end of elementary school in order to take advantage of mainstream secondary school instruction" (Davidson, 1992, p. 68). Accelerated Schools provide a vehicle to accelerate learning rather than remediate learning (Levin, 1987; McCarthy, Hopfenberg, & Levin, 1991).

Accelerated Schools have three guiding principles: a) unity of purpose; b) empowerment coupled with responsibility; and c) building on strengths (Levin, 1987). Unity of purpose refers to developing a vision of schooling that meets the agreement of teachers, students, and parents so that all will be focused on a common goal (Levin, 1988). This is an important component of the Accelerated Schools movement as it serves as a unifying framework for all organizational, curricular, and instructional endeavors (Davidson, 1992).

The second principle, empowerment coupled with responsibility, refers to empowerment of the participants to make important decisions both in the home and at the school level so that the education of the student is improved (Levin, 1988). "Empowerment and responsibility will break the present stalemate in which teachers, administrators, parents, and students tend to blame each other for the poor educational outcomes of students" (Davidson, 1992, p. 81). Thus, this principle requires that a shift be made to site-based decision making, where teachers, parents, and the administration take on new roles.
The third principle, building on strengths, refers to "utilizing all the learning resources that students, parents, school staff, and communities can bring to the educational endeavor" (Levin, 1988, p. 23). Therefore, education will build on strengths rather than weaknesses of the student and the community.

As Levin (1988) describes the Accelerated Schools process, these prominent features are included in the Accelerated School:

1. **School-based Governance**: The teachers and other school staff share the decision making with the administration.

2. **Goals**: The goals that are established by the governing body of the school must be in conjunction with the school district and board.

3. **Pupil and School Assessment**: Two types of assessment are made. One is the assessment needed to evaluate the performance of the students at school entry to set a direction for meeting the overall school goal. The second assessment is a school-wide system that measures the progress of the teacher and student attendance, student participation, and parental involvement.

4. **Curriculum**: The curriculum is heavily language-based, including mathematics and science.

5. **Instructional Strategies**: The instructional strategies should "reinforce the curriculum approach and build on techniques that have shown effectiveness with the disadvantaged" (Levin, 1988, p. 29).

6. **Parental/Family Participation and Training**: Parental involvement is an important feature of Accelerated Schools, and the school provides parents many opportunities to become involved.

The Accelerated Schools movement involves a restructuring process by which each school goes through a period of: 1) taking stock; identifying the present conditions or what is of the school, 2) establishing a vision; formalizing the common goal, 3) identifying areas where the present conditions do not meet the expectations set forth in the vision challenge.
areas, 4) establishing a governance system; how the group arrives at a decision, 5) engage in a "collaborative inquiry process in which the group: a) attempts to understand the nature of the challenge area, b) searches for possible solutions inside and outside the school, c) synthesizes solutions, d) pilot tests selected solutions, and e) evaluates the effectiveness of these solutions" (Levin 1988; McCarthy, et. al., as cited in McCarthy, 1992, p. 7).

The Accelerated Schools Project is not a prescription for all schools. Of the more than 500 Accelerated Schools located in 33 states around the nation (Hopfenberg, Levin, & Associates, 1991), each school will differ according to its needs. "No one single feature makes an accelerated program but rather a set of curricular, instructional, and organizational practices are used to create an Accelerated School" (Davidson, p. 80). Three such examples are Hollibrook Elementary School in the Spring Branch Independent School District in Houston, Texas, the 99th Street School in the Watts section of Los Angeles, California, and Eugene Field School in Hannibal, Missouri.

Hollibrook Elementary School enrolls a student body of over 1000 students each year. Approximately 90 percent of the students are from families below poverty level. In 1988, the school's fifth graders were about two years below grade level in reading and language arts. By the spring of 1991, with two years of application of the Accelerated Schools process, Hollibrook's fifth graders were performing slightly above grade level in their composite scores as measured by the SRA, a standardized norm-referenced test (McCarthy & Still, 1993).

The 99th Street School in Los Angeles has about 700 students of which two-thirds are African-American and one-third are Hispanic. Prior to the 1990-91 school year, 99th Street was one of the bottom 20 schools in achievement among the 650 schools in Los Angeles. By 1992, having participated in the Accelerated School process as well as having weathered the worst urban riot in U.S. history, 99th Street's reading scores jumped from the 18th percentile to the 30th percentile (Hopfenberg, Levin, & Associates, 1991).
At Eugene Field School in Hannibal, Missouri, some three quarters of the kindergartners enter school at least six months behind in language development. Despite starting behind the norm for their age, almost 90 percent are above grade level in reading by the end of second grade. Additionally, Field had a 77 percent drop in major discipline referrals between 1987-88 and 1991-92, and retention of students fell almost 80 percent over the same period (Hopfenbert, Levin, & Associates, 1991).

Accelerated schools are designed to bring at-risk students into the education mainstream by the end of elementary school by adhering to a very basic premise: At-risk students must learn at a faster rate, not a slower rate that drags them farther behind (Hopfenberg, Levin, & Associates, 1991). This paper will continue to assess the effectiveness of the Accelerated Schools process as translated through a multi-age classroom organization.

Section Six: Conclusion

"We must reexamine the institution of the graded school and determine the degree to which it is the source of high rates of academic failure among at-risk students. Otherwise, we will continue to opt for quick solutions that do not address the problem." (Cuban, 1989)

Research demonstrates that multi-age grouping has had a positive effect on students' academic and social growth (Anderson & Pavan, 1993). The previous reviews suggest the importance of constructivist teaching strategies and student-centered interactions (talk) to the academic and social growth of at-risk students (Cazden, 1988; Goodman, 1986; NCTM, 1989).

Views of achievement motivation explained through student perception of teacher acceptance, students' sense of acceptance by their classmates, and students structuring their own goals provide overlapping insight into the components of interactions between students and teachers and the concomitant relationship to academic growth.

What these studies fail to do, however, is to examine these important variables (interactions, instructional strategies, academic growth) within a multi-age context that has
evolved from the Accelerated Schools process, a context where these variables have been operationalized through teacher application but have not yet been reviewed by the rigors of research.

This study will extend the present research in the area of program definition. Specifically, it will delineate instructional strategies utilized in a multi-age classroom, the influence of student and student, and student and teacher interactions on those instructional strategies as well as that same influence on teachers' constructs in a multi-age setting; areas that have been explored in a limited manner in the current research (Anderson & Pavan, 1993; Goodlad & Anderson, 1987; Katz, 1990; Miller, 1990; NAEYC, 1986).
CHAPTER 3

Research Methodology

Within this chapter, research methods used to examine the social interactions of identified at-risk students and their teachers in a multi-age context, the relationship between these interactions and instructional practices, and the achievement shifts that occur as a result of instructional practices in school will be described. The first section describes the research context inclusive of the school setting and organizational process through which collective decisions are made. The second section describes the rationale for selection and description of research participants. The third section describes the rationale for selection of the research paradigm. The fourth section discusses the data collection procedure and data analysis. The fifth section presents strategies that will establish goodness of the study. The final section outlines assumptions and limitations of the study.

Section One: Research Context

The Desert Elementary School (DES) is a K-5, multi-age grouped elementary school located in a southwestern desert community. DES has been identified by the county school district as an at-risk school, with 38 percent of its population receiving free or reduced lunch. The student population consists of 10 percent Hispanic, 3 percent African-American, 1 percent Asian, and 86 percent Caucasian. The faculty and staff ethnic distribution is commensurate with that of the county as a whole which is approximately 15 percent Hispanic, 5 percent African-American, 1 percent Asian, and 79 percent Caucasian.
As a principal employed in a growing community, I had applied for the opportunity to open a new school and was appointed to begin DES. Having been a principal at another elementary school in the same district, I was able to bring a core of teachers with me to DES. Together we began planning DES's instruction and organization based on a child-centered, continuous progress, and developmentally appropriate curriculum. We visited one school, located in the northern, rural part of Nevada, that had implemented three multi-age classes. With local university support, in-depth research, and staff development, the multi-age program was planned. Frequent meetings were held with the community to inform them of the philosophy and organization of the school, on-going staff development began, and instructional materials were ordered. DES opened its new building doors in the fall of 1991, along with eight other elementary schools in the same district.

**Accelerated Schools Project**

The organizational umbrella for this multi-age elementary school is that of Accelerated Schools. The Accelerated Schools model is founded on the principle that all students, including at-risk students, can benefit from a curriculum that views the learner as gifted and talented. At-riskness is defined as a mis-match between what the learner brings to the situation and what is expected (Levin & Hopfenbert, 1991). Therefore, by adhering to the philosophical tenets of unity of purpose, empowerment coupled with responsibility, and building on strengths, an educational process is built that meets the needs of all children (McCarthy, Hopfenberg, & Levin, 1991).

Having received sixty hours of training in the philosophy and decision making process of Accelerated Schools, teachers are empowered to make decisions relating to curriculum, instruction, and school organization. By utilizing the inquiry process, each challenge area identified by the staff and subsequent decisions made to address these challenges, receive full scrutiny. The process focuses on the challenge area by exploring the problem informally and hypothesizing why the challenge exists. The results of testing or surveys are interpreted to
develop a clear understanding of the challenge area. Solutions are brainstormed, then synthesized and an action plan developed that is pilot tested and/or implemented. All plans are thoroughly evaluated and regularly reassessed to assure that the school's vision is actualized.

Faculty cadres meet weekly to develop action plans within targeted challenge areas and present these plans for staff consensus. As a result, DES has implemented programs that provide individualized staff development for teachers, school-involvement activities for parents and the community, school-wide incentive programs for students, integrated, thematic instruction, and a school-wide portfolio system.

Individualized staff development was accomplished by the production of a course catalogue, similar to those used in major universities. Each staff member completed a survey relating in-services needs to improve teaching and learning. The staff development cadre compiled these needs, researched what defined a quality staff development model, secured experts in the field and supporting resources and then published the catalog, complete with registration forms. As a result each staff member had a tailor-made training program that included presentation of information, opportunities for implementation in classrooms, feedback and follow-up sessions.

The systematic inquiry process also resulted in the implementation of a school-wide portfolio system. Through the development of a partnership with local university personnel, a systematic program was developed that resulted in teacher education, parent involvement, and student empowerment through this implementation of individualized student portfolios.

**Multi-Age Grouping**

The multi-age configuration at DES is based on research relating to the normal cognitive development of children, specifically, that students develop along cognitive continuums just as they do socially, emotionally and physically (NAYEC, 1986). Students are heterogeneously grouped according to primary and intermediate levels, and progress
according to their natural learning rate. Both primary and intermediate classes are located within three different wings or pods throughout the school. Each pod is called a family and has adopted a personalized name. As students progress through the levels, they remain with the same teacher at the primary and intermediate levels and transfer from a primary teacher to an intermediate teacher within the same pod.

Flexible grouping is adhered to throughout the school. DES administration and faculty utilize the operational definition of flexible grouping that refers to grouping modes determined by the need of the student, the content being presented and the instructional strategy being utilized. This definition translates to a school environment where student grouping is fluid, and specialists provide needed instruction within the context of the classroom. For example, a student identified as qualifying for special education services (or reading improvement or English as a second language) may remain in the classroom with his/her peers. The cooperative/consultative teacher will address the student's needs maintaining the content area focus of the entire class. Additionally, students not identified as special need, but perhaps experiencing similar difficulties may benefit from the specialist's instruction within flexible grouping parameters.

Based on Canady's (1979) block scheduling process, joint planning time (from 50 to 100 minutes each day) is provided for every teacher. This time allows for regular classroom teachers to cooperatively plan, resulting in shared expertise in thematic unit development and team teaching experiences. Each specialist (English As Second Language, Reading Improvement Program, Gifted And Talented Education, Special Education) also schedule at least one day a week for joint planning with the regular classroom teacher. This joint planning allows for a collegial partnership between teachers in providing an optimal instructional program for special needs students.
Section Two: Research Participants

Examining the social interactions of identified at-risk students and their teachers in a multi-age context, the relationship between these interactions and instructional practices, and the achievement shifts that occur as a result of instructional practices in school suggests the need for a criterion-based selection process (LeCompte & Preissle, 1993). While the research has examined at-risk students (Cuban, 1989; Hopfenbert, Levin & Associates, 1991), student academic shifts as a result of particular instructional strategies (Goodman, 1986; Johnson & Johnson, 1990; Kagan, 1989), and some aspects of classroom interactions among students and teachers (Cazdan, 1988), studies are limited within the context of a multi-age classroom.

In order to purposefully select participants who can better inform the study, teachers were first identified by their peers and/or principal, as those possessing positive group interaction skills as demonstrated through their effective classroom management and who had taught in a multi-age setting for at least two years. The snowballing approach (Bertaux, 1981) was used to identify a chain of participants for interviewing and observing. The inclusion of teachers identified as less than successful in social interactions allowed for sampling of deviant cases (Lincoln & Guba, 1985; Patten, 1980).

To inform the study specific to the question of academic change, students were selected who had lived in the attendance zone of the DES school for a period of three to five years. As researcher, I had access to records recording the academic history of these students. These same students were observed in classrooms of teachers described by prior criteria.

Section Three: Research Method

The influence of multi-age grouping as stated in the specific research questions is a socially constructed phenomenon which called for descriptive data gathered in a socially...
constructed environment (Osborne, Wilson, & Anderson, 1985). This research required a fluid and developmental process of investigation to examine the parameters of the influence of multi-age grouping. Such a process is represented by an ethnographic research design (Strauss & Corbin, 1990). This case study analysis, being "anchored in real-life situations" (Merriam, 1988, p.32), allowed for the intensive, in-depth examination necessary to examine the phenomenon in a holistic account (Yin, 1989).

Theoretical sensitivity (Strauss & Corbin, 1990) gained through professional and personal experience in implementing multi-age grouping in an elementary school as principal, enabled me to purposely select the school site. Being familiar with the literature on multi-age grouping and having implemented a district sanctioned multi-age program for a period of three years provided additional theoretical sensitivity. Within the three years, I assisted other district elementary schools with implementation of similar multi-age programs. Consequently, I was knowledgeable of school sites that could inform the study.

Section Four: Data Collection and Analysis

Multiple data sources were used to triangulate data (Strauss & Corbin, 1990). The primary sources of data collection included field observations, surveys, document reviews, and interviews. A case study protocol and a set of research questions (Yin, 1989) guided collection of data. The protocol included an overview of the case study project for presenting the case study to the participants, a time-line for scheduling field visits, an outline of questions that guided the researcher's initial inquiry, and the identification of probable sources of evidence.

Data was collected at least weekly for a period of one semester. As researcher, I scheduled voluntary interviews and observations with the selected teachers and students.

Interviews were conducted on the school site, during a time mutually agreed upon by the participant and researcher. I followed the suggestion of Oakley (1981) to engage in a
dialogue that, "... has the warmth and personality exchange of a conversation with the clarity and qualities of scientific searching" (Goode & Hatt, 1982, p.191, as cited in Oakley, 1981).

Open-ended interviews began with one question, designed to stimulate further inquiry, asked of respondents in relation to each appropriate research question.

1. Tell me (student) all the things you can do in the classroom with other classmates.
2. Tell me (student) all the things you do with your teacher in the classroom.
3. Tell me (teacher) all the things you do with students in the classroom.

Information acquired in the open-ended interview was used to develop the general interview guide (Zelditch, 1962). The general interview guide was a set of issues, developed before the interview, that provided specific information. The issues were addressed any time in the conversation but the guide assured that all relevant topics were covered for each respondent.

Observations occurred in the classroom setting in order to observe interactions within the actual context of a multi-age class. As the study unfolded, I determined, utilizing purposeful (Siedman, 1991) and theoretical (Strauss & Corbin, 1990) sampling, the informants, incidents, situations or events that had potential for informing the study.

Observations included stream-of-behavior chronicles (Barker, 1963). A stream-of-behavior chronicle samples across participants, events, and settings to collect chronicles pertinent to themes and questions (LeCompte & Preissle, 1993). These observations helped to delineate categories of interactions, generate process data of how materials were manipulated and what styles teachers used (LeCompte & Preissle, 1993).

Surveys were administered to all participants in the study. Participant-construct instruments were developed to help identify the social interactions that structure the life of each participant. The initial survey question was:

1. (Student) What are all the things you think you and your teacher can do in the classroom?
2. (Teacher) Describe the interactions you experience with your students in the classroom.

The surveys were developed further by asking participants to sort and arrange given sets of items to discover the boundaries of categories. "Through conversations with respondents, investigators elicit the parameters of categories and the canons of discrimination used to determine them" (LeCompte & Preissle, 1993, p.51).

Artifacts were used to provide additional evidence for the questions addressed in this study. Initially identified artifacts of norm referenced tests, criterion referenced tests, student work portfolios, and researcher solicited daily journals were examined to add validity and insight to observations and interviews and possibly generate new lines of inquiry.

Student work portfolios were organized into categories of language arts, math & me, literacy, problem solving, the world around me, teacher and parent support, and the science world around me. All teachers in DES have been trained in the selection and annotation of materials, conferencing with students, and organization of these student portfolios (Spindler, 1982). Daily journals chronicling daily classroom events were obtained from students and teachers.

Data collection and analysis was an interrelated process (Strauss & Corbin, 1990). As data was collected, it was analyzed and used to direct purposeful and theoretical sampling procedures for additional interviews and observations. Of particular interest was the exploration of the phenomena within a multi-age context that influences student/student, student/teacher interactions, and academic achievement. As concepts relating to the research questions were generated, they were considered on a provisional basis until repeated examples were found in similar forms or absent in subsequent interviews, observations, or documents (Strauss & Corbin, 1990). A concept's relevance was repeatedly analyzed by seeking relevance within the data. Theoretical memos were used to sensitize and summarize inductive or deductive thinking about relevant and potentially relevant categories, their
properties, dimensions, variations, processes, and conditional matrix (Strauss & Corbin, 1990).

Following the suggestions of Strauss and Corbin (1990), I generated key concepts that explained general trends relating to the research context and questions. Incidents, events, and happenings that were identified in observation notes, interview transcripts, and documents were isolated and compared. Concept maps were used to depict possible relationships and explore use of more abstract terms to name or label the concepts.

Coding Process

Strauss and Corbin's (1990) open and axial coding was used to analyze data. Open coding was used initially to analyze the data for comparison of similarities and differences between interactions of teachers and students. Similar events, actions, and interactions of the subjects were labeled and grouped to form categories related to the research questions.

Axial coding was used to examine categories identified in the open coding stage. Categories were related to subcategories and tested continuously against the data. Incoming data was consistently analyzed in terms of the developing categories. As new categories emerged from the data, existing categories were continuously modified. It is from this analysis that the ultimate themes regarding multi-age grouping emerged.

Section Five: Goodness of Study

Criteria outlined by Lincoln and Guba (1985) for establishing goodness of study of naturalistic inquiries were used in this study. The criteria include credibility, transferability, dependability and confirmability. Methods used to meet the four criteria in this study are summarized in Figure 2.
Figure 2
Criteria for Goodness of Study

<table>
<thead>
<tr>
<th>Qualitative Criteria</th>
<th>Methods</th>
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<tr>
<td>Credibility (Internal validity)</td>
<td>Triangulation</td>
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<td>Persistent, repeated observation</td>
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<td>Peer debriefing</td>
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<td>Member checks</td>
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<td>Documentation</td>
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<td>Transferability (External validity)</td>
<td>Thick, descriptive data</td>
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<td>Theoretical, purposeful sampling</td>
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<td>Confirmability (Internal reliability)</td>
<td>Triangulation</td>
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<td>Chain of events</td>
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<td>Dependability (External reliability)</td>
<td>Case study data base</td>
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<td>Chain of events</td>
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Credibility

Triangulation (Mathison, 1988) is the primary means for establishing credibility in this study. Multiple data sources were used. A number of individuals were interviewed, observations were made of varied classrooms within the school setting, and varied documents were collected.

Transferability

Set in a social/behavioral, naturalistic inquiry, transferability of the study is context bound. Findings of this study are descriptive or interpretative of the given context and do not have general applicability. The results of this study should be transferred only to similar participants in a similar context.
Confirmability

Triangulation of data and methods was used to establish data and interpretational confirmability. In a strategy noted by Lincoln and Guba (1985), "collecting data from a variety of perspectives, using a variety of methods, and drawing upon a variety of sources so that an inquirer's predilection are tested as strenuously as possible" (p. 87).

A chain of evidence was developed (Yin, 1989). All records such as raw data, field notes, and products resulting from data analysis was organized and categorized in a case study data base.

Dependability

Procedures outlined by Yin (1989) were used to develop a formal, retrievable data base that can be used by other researchers to review the evidence collected. The case study data base is separate from the case study report. It includes the researcher's field notebook, case study protocol, interview transcripts, and documents collected during the study.

Section Six: Assumptions and Limitations of the Study

The assumptions of this study are imposed by the theoretical framework. Specifically, (a) that the knowledge students acquire in the multi-age grouping context was acquired as a result of their interaction within the classroom, and (b) that shifts in academic achievement over time are one way of determining the long-range influence of multi-age grouping on students.

The limitations have been imposed by the methodology. Acknowledging that I am researching a context for whose implementation I was responsible, I followed the suggestions of Peskin (1978) and explored my own subjectivity. Additionally, as with all qualitative research studies, the termination point is difficult to determine and the final decision was impacted by the data.
CHAPTER FOUR

Qualitative Investigation

Within this chapter findings on student/teacher and student/student interactions on multi-age grouping in an Accelerated Schools context are presented. Five research questions guided data collection and reporting of findings:

1. What is the nature of social interactions of selected at-risk students with other classmates in a multi-age classroom?

2. What is the nature of social interactions of selected at-risk students with their teacher in a multi-age classroom?

3. What are the instructional strategies utilized with at-risk students in a multi-age school where academic shifts have occurred over time?

4. What are the influences of social interactions and instructional practices in a multi-age context?

5. How do these social interactions influence selected teachers' constructs about classroom instruction in a multi-age setting?

As data was collected, trends emerged in the nature of social interactions between students and between students and teachers. Instructional strategies utilized in this multi-age context were defined, academic shifts reported, and the influences of these social interactions and instructional strategies on teachers' constructs about classroom instruction emerged. These trends were translated into themes that were grounded in the theoretical framework.
The first section of this chapter addressed questions one and two by describing the social interactions between students and between students and teachers within the context of a multi-age classroom. Themes emerged as the impact of these social interactions were addressed. The themes addressing student interactions followed the line of research by Cazden (1988) and included (a) student in complementary roles, (b) student relationship with audience, (c) student as collaborator, (d) student exploratory talk, and (e) student status. Those addressing interactions between students and teachers were (a) teacher-as-facilitator, and (b) teacher-as-learner.

The second section addressed question three by reporting academic shifts that occurred over time and the instructional strategies utilized by teachers in a multi-age setting. Themes which emerged from this data are presented. These themes were learning continuum, questioning, process instruction, integrated instruction, flexible grouping and planning.

The third section, addressing question four, described the influence of socially constructed interactions on teachers' constructs regarding classroom instruction. This synthesis of data described the inter-related nature of interactions and instructional strategies.

The final section, addressing question five, presented data that described the impact these interactions had on teachers' constructs regarding classroom instruction, founded in social constructivism, the theory that grounded this study.

Prior to discussing each descriptive theme, the teaching philosophies, as revealed by the data, are reported. Though not a part of the original research questions that framed this study, these perspectives were embedded in teacher responses and document reviews and emerged in relation to the focus questions. These perspectives supported a contextual framework from which to view the interactions and instructional strategies impacted by multi-age grouping and the influence of the socially constructed interactions on teachers' constructs regarding instruction.
Pedagogical Philosophy

Basic beliefs regarding instruction, students, and teachers were documented by the staff-as-a-whole in the school's belief and mission statements and presented in Figure 3. This document was created by the staff as a whole in a day-long intensive session during their first annual retreat. Dialogue took place that resulted in belief statements in response to the categories of teachers, instruction, and students. These belief statements were framed and hung in each room, along with the supporting mission statement. These documents served as a constant reminder of their collective principles regarding students, teaching, and learning.

Figure 3

WE BELIEVE...

Teachers
1. Teachers are professionals who are committed to the development of the total child.

Instruction
1. Instruction is adaptive, flexible, and dynamic.
2. Instruction continually evolves to respond creatively to children's needs.

Students
1. Students are capable of learning and accepting responsibility.
2. Students are capable of independent thinking and problem-solving through a variety of learning styles and experiences.
3. Students cooperatively adapt to a variety of environments by applying their knowledge and skills to real-life situations.

Mission Statement
We are learners, cooperatively building a community of happy, responsible citizens.
This commitment to meet the individual needs of students was a common philosophical theme with the teachers at DES. Beyond formal statements, teachers had internalized these beliefs. Mrs. Iam, a primary teacher, noted, "You have to look at each child individually. I knew inside myself that kids needed the time to develop whatever it was we were trying to teach." This commitment was demonstrated through an expansion of curriculum boundaries. For example, Mrs. Iam said,

It doesn't make sense to know a child can read beyond say the third grade level but not be allowed to go beyond that level because it might mess up what he/she is going to read next year. I'm not teaching the child if I know he/she is ready by keeping him/her at that level text.

The pedagogical philosophy of this staff was forged from the combined beliefs of the entire faculty. The resultant formal philosophic statements centered around teachers' view of self as professionals, students as capable and responsible, and instruction as interactive and flexible. The corresponding mission statement served as a continuous beacon to guide teachers through their journey of teaching and learning. A journey that traversed through a context built upon the beliefs and philosophy dedicated to educating all children.

The Context

Dyson (1987) stated that, "When children go beyond themselves to share experiences, ideas, and opinions, they engage in much of their most intellectually demanding work" (p.57). To do so, she continued, "Children can display their construction of possible worlds and their manipulations of those parts of those worlds only when they are given building space" (p.57). To go beyond themselves the context, the building space, must exist that fostered this behavior. A context that built trust, encouraged risk-taking, and recognized the strengths of each individual provided this building space.
Students within this multi-age context were grouped heterogeneously in their individual classrooms. Each class contained equal number of students of high, medium, and low abilities as documented in the annual, district-wide achievement report. In addition boys, girls, and balanced numbers of students within the two year grade span were placed in each class.

The differential factor in these class configurations, compared to traditional, single age organization, was that of the extended age span of students within one class. Furthermore, teachers did not view students according to specific age delineations but rather along an age continuum. A reflection made by the assistant principal, and central to the description of this multi-age context, suggests the absence of age or grade boundaries as students interacted,

Well I always thought .. you could go into the classroom and tell who was who but here I go into a classroom and I can't tell which ones were the first graders and which ones were the second graders. I spent a lot of time in the intermediate classroom. I really don't think I saw a particular group of kids consistently overwhelming the conversation in small group discussion.

This description was expanded by Mrs. Hay, a reading specialist within the school,

I see much less competitiveness in a multi-age classroom than I saw in a single age. I think this might be a result of the teachers' expectations for the students as individuals. You know, the feeling of not knowing whether the child is a first grader or a second grader. I know when I go in and talk to the teachers, if I ask what grade level a particular child is they can't even tell me without looking it up.

The rationale for this context was articulated by Mrs. Nen, a primary teacher with four years teaching experience,

My biggest thing is your behavior. If you're not behaving you're preventing others from learning and me from helping others to learn. So they know that they not only have a responsibility to themselves but to those other kids to make sure that they are learning also.
Teachers' view of students as individuals who progress along an expanded age continuum as well as their expectations for cooperative learning and behavior established a context where the building space for learning might occur. The elements of this classroom composition were critical not only to the description of context but to the interactions as reflected in subsequent themes.

Social Interactions Between Selected Students and Students

Cazden (1988) revealed that discussions of the role of social interactions in the development of cognition, learning and knowledge, did not explicitly distinguish between interactions with experts (those who understand more about the particular matter at hand) and interactions with peers (other learners of generally equivalent understanding). Additionally, she stated that this distinction was necessary to understand when exploring the development of cognition, learning, and knowledge. Given that cognition, learning and knowledge occurred within specific contexts; these concepts of interaction with experts and peers served to describe the impact of multi-age grouping (a context) in relationship to social interactions among students. Looking closely at the interactions among students was warranted, then, in order to assess the impact of a multi-age context, a learning environment where cognition and knowledge were developed.

Within this setting, with grade delineations blurred, the central concepts of student-as-expert, one who possesses the knowledge and is sought after, and student-as-peer, one who interacts with others sharing cognitive exchanges that increase knowledge, were embedded throughout the data. Themes emerged, consistent with Cazden (1988), that reflected these concepts. The themes of complementary roles, students' relationship with audience, student as collaborator, student status, and students' exploratory talk were grounded in the data. These themes are detailed in the following sections.
Complementary roles

Within this category the concepts of student-as-expert and student-as-peer were embedded within the theme of complementary roles; students performing tasks together and assisting one another in their areas of strengths.

Students worked together and assisted one another on a regular basis. The concept of students assisting one another was described as being natural and logical by an eleven-year-old intermediate student. Billy said, "There's more ideas coming into it [the group activity] so the more ideas you have the easier it is to figure out the problems and to have the help." This same student also captured the concept of students' strengths, and students' ability to teach, regardless of age or grade,

Some fourth graders are really good at things, better than fifth graders and they help us too. There's things that I'm real good at too, better than fourth graders and other fifth graders so I'm not worried if someone is better than me. Like at math, because it's not my strength.

He observed the importance of student's individual academic strengths that are not always based on age.

Building on the ability of students teaching other students, a seven-year-old primary student presented the depth to which students assist one another in her description of strategies utilized,

Well, when they [students] don't know something, like if they don't know a word and they need help spelling it, I help them with it. I ask them to get a dictionary and help them look up the letter they're looking for; the first letter in it and we go down until we find the next letter, the second letter in it and then after that we look for the word.

While it might have been easier to just spell the word for the child, this student supported her peer in developing independent learning strategies.
One primary teacher provided the instructional rationale for the facilitation of these complementary roles. In her reflections, she wrote,

You are going to have differences in any classroom. You would have readers tutoring non readers and someone more capable in math helping that person in math. You would have the different grouping in math so that the children who are thinking more logically can help the other kids understand the way they are solving the problem.

The behavior of students in complementary roles was such an integral part of the classroom that it continued even in the teacher's absence as demonstrated in my classroom observation,

Primary classroom, teacher absent, two students standing together in front of class. One student asking another student what time it was (holding clock in clock exercise). Student hesitated to answer, the second student standing up whispered in other student's ear, "Ask him if he needs help."

The concept of student in complementary roles extended outside of individual classrooms. Whole classes of intermediate students worked with primary students during scheduled buddy days. These buddy days were designed to facilitate teacher staff development as well as encourage cross-age tutoring. One intermediate class would pair with one primary class. One teacher would remain with the entire group while the other teacher attended a staff development activity for a specified period of time and vise versa. During this class time, the teacher would facilitate a lesson, planned by both teachers, that encouraged older students to tutor younger students. Language experience stories and paired reading were activities commonly implemented during these times. Additionally, groups of students from general education assisted early childhood, three- to five-year-old handicapped students, in their classroom, and youngsters of all ages interacted in the lunchroom and playground. The assistant principal summarized these examples,
What I saw a lot of, and this is just a very generic example, a lot of younger kids working in intermediate classrooms. Taking time out of their classrooms to go and help in another classroom for whatever reason. Or the older kids going down to some of the other primary classrooms and helping out in whatever manner was necessary.

Finally, the student in complementary roles held up over time. Mrs. Nen, in her interview dialogue, reflected on the maintenance of this student behavior over a period of two years,

This is probably the first year that they ever worked together so much in so far if someone didn't understand it they weren't raising their hands to ask, they were raising their hands to say, 'but here it is.' They were talking to each other and saying, 'but here is how it works, here is the information.' I really got to sit back this year and facilitate a lot more this year. And that's the value of keeping the kids for more than one year because they do know those techniques and those questions. Those kids will come back next year and they'll know the way things work and the questions and they use them.

Student/student interactions in complementary roles included a rich mixture of social interaction and instructional focus. Students performed tasks together (student-as-peer; social interaction) and assumed problem solving roles (student-as-teacher; instructional focus). This behavior occurred without teacher assistance and held up over time.

Students' relationships with audience

Data emerged within the theme of students' relationships with audience that demonstrated the type of feedback students provided one another through a variety of social interactions. This feedback was given from students and to students by the students themselves. The feedback provided relationships that enhanced the concepts of student-as-teacher and student-as-peer and was valued by the teachers. Mrs. Nen expressed her belief in the value of student interactions,

Kids are more in tune with each other than they are with the teacher insofar as they are willing to listen to suggestions. When it comes from the teacher, it's sometimes seen as criticism rather than help.
Mrs. Nen's belief directly translated to classroom behavior. She explained, "When they finish, the first thing they do is to go around and see if anyone else needs any help. If you need help, you ask three people first of all for help and then you come ask me." This student behavior, initially modeled by the teacher, became internalized by the students.

The students' relationship with others were purposefully encouraged and fostered in the classrooms by the teachers through their modeling and explanations. One intermediate teacher designed instruction that facilitated students' relationships with others. Within this instruction, intermediate students designed lesson plans for primary students. The lessons focused on language arts and included oral reading, comprehension activities, and production of literary products. A primary goal was to "encourage the students to trust and interact with one another, to see themselves and others as capable."

A nine-year-old student explained the activity,

In our class every Wednesday we tutor Ms. Jan's class. What we do is before Wednesday we make up a lesson plan. We pick out a book and we plan an activity that has to do with the book for the child we are tutoring. We read the book to the child and then we do the activity. Sometimes the activities take more than one week. Some examples of activities are: Draw a picture of what the book was about. Make something that had to do with the book out of construction paper. Write down what they heard in the book. After we are done tutoring (which takes about an hour) we write in our response journals about how it went with our child and what we can do to make it better next time."

This same student characterized the reflection and tolerance learned as a result of this activity. In her reflection, she wrote,

Today went pretty well. We didn't get completely finished. Today her friend kept calling her over and talking to her. So she kept leaving me. So next week I am going to try to keep her with me. I think I will try to stay a little bit farther away from other people and keep her a little more occupied. As soon as we finish this project it will be an activity she wants to do.

Through this reflection it was clear that the concept of student-as-teacher was recognized through the theme of one's relationship with audience. This relationship was first expressed through the recognition that student motivation was increased when the
interaction with audience (the tutor) was appropriate to the task and included choice. Furthermore, the value of this relationship was expressed in the recognition that attention was focused when not disrupted by conflicting audiences.

The value of students' relationships with one another and the facilitation of these relationships by teachers resulted in shifting of roles between teacher and learner. A primary student described the reciprocity, the shifting of roles as teacher and learner that naturally occurred as students related with one another,

Heather helps me out in writing. She gives me ideas. Like if I can't figure out a story to write about ... a shark, cuz I don't like sharks, she'll give me an idea. She'll say, "Why don't you write about a shark that came out of the water and started talking to you?"

The concepts of student-as-teacher and student-as-peer were observed within the theme of students' relationship with audience. Students' relationships, as demonstrated in part by their feedback to one another, the facilitation of these relationships by teachers, and the shifting of roles as teacher and learner all served to define these concepts.

**Student as collaborator**

The ability to collaborate, or work together to share cognitive exchanges that increased knowledge emerged from the data of students' interactions with one another, supporting the concept of student-as-peer. This collaboration included various skills in a variety of classroom contexts.

Student collaboration was facilitated, in part, through teacher modeling. My field notes, from a classroom observation, characterized this modeling through provision of opportunities for students to make decisions.

Teacher delivered instructions regarding problem solving strategies. Groups were to follow instructions in order to re-cover classroom tables with new butcher paper. Students moved quickly to their groups, organized themselves and their materials by moving tables, selecting recorder and setting about their task. Student talk included estimations about amount of tape, how to spell particular words and decisions about the strategy to use to measure. This measurement was
accomplished by using both standardized (rulers) and non-standardized (straws) measurement techniques. The teacher circulated from group to group encouraging/praising problem solving strategies, "How will you solve that problem?" "I appreciate your solving the problem yourselves." Questioning to extend thinking, "What do you need to tell me about the tape?", and to assure all students were working as a group, "Did you tell the recorder what you were thinking?"

A sequence of events relating to a classroom business, provided another context in which students discovered discrete skills necessary for collaboration. The business, designed by the students, included an elected board of student directors, required a market analysis performed by the class within the school as a whole, securing of funds from a community financial institution, and ultimate sales of service or product. These intermediate students' collaboration led to their discovery of the need for effective communication, organizational skills, group responsibility, and tenacity.

We are working on a movie. Me and a few other kids worked on background and stage-props and we made a barn. It took us a long time because we didn't tell each other what we were doing. We made a lot of other things but they only took about a day or less but the barn was the big one that took us a very long time but if we told each other stuff it would not take so long.

The lack of communication was a result of poor organization as opposed to opportunities to interact with one another. When the project began, the students divided the duties equally between them, including a division of the construction of the barn. They quickly realized that one job, divided by many, can only be accomplished through coordinated efforts and frequent communication.

A physically challenged student in this same class characterized the collaboration of all students as he typed, to compensate for his motor difficulty, "I worked with [five students]. We made costumes, makeup, hair. We made costumes first. I liked acting like a turkey."
Mrs. Hay, the school reading specialist, extended this collaboration to other academic settings. She observed,

I've seen groups of children working together after they've written stories and they'll read to one another and make suggestions about whether or not it makes sense, making additions or corrections to what the child has already written. And I think that helps each of them to grow.

This same type of collaboration, in a small group situation, where each child gave input was described by the assistant principal,

I recall going in one classroom. They were doing a lot of brainstorming about how they were going to put together the kaleidoscope. One group of kids had butcher paper out and they were drawing what they thought the picture should look like and what colors they should be. Just kind of leaning over on their arms and you know drawing different pictures. Everyone had input as to what it was going to look like.

Working within this small group context, each child provided ideas relating to the eventual finished project. As a result, the finished project was more complex and contained a richer array of ideas than had it been completed in isolation by individual students. Furthermore, students experienced the power of collaboration of thought that resulted in a more complex form of knowledge and refined idea.

The students collaborated in a variety of social interactions; one-to-one, small group, and large group. Their collaborations facilitated the discovery of skills necessary for successful collaboration as well as resulting from collaboration. Those skills were communication and problem-solving. The application of those skills in a collaborative context resulted in complexity of thought and ideas.

Student status

Student status emerged as a theme grounded in the data and supported the concept of student-as-teacher. Knowing who to go to for help and why was an important dimension revealed in the interactions between students and students. The rationale for this student behavior was pointed out by Mrs. Pao, a first-year primary teacher, "Well,
kids have connections. They have friends and they really know who has the information. They know who to go to if they aren't getting the answers that they want." An essential component of this student status expressed by Mrs. Pao, was that all students were recognized for their abilities, "Even a non-reader, even an emergent reader sometimes will get asked for help by somebody."

In other classrooms, student status was created by teachers through assigned responsibilities. Mrs. Hay noted, "In some classrooms there will be two or three children appointed as spelling specialists and those are the kids that the other children will go to for help with spelling before they go to the teacher." The rationale for appointed student status is explained by Mrs. Nen as a way of enhancing student self-esteem,

There are some kids that no one ever goes and asks. They may be the ones who are always going for help and no one is ever coming to them because they are usually the last ones working on the assignment. For those students who need more self support, I ask someone to go to them sometimes too.

The same idea of students' refusal to assist or be assisted by certain others existed in relation to prior experiences with more traditional classroom contexts. Mrs. Boe, an intermediate teacher, provided insight into this phenomena as a result of having a class that had attended a traditional school for their first three to four years and had recently been instructed by a traditional teacher (defined as one who does not hold the aforementioned philosophy),

I don't think some of the kids would ask other kids for help because they think they were higher or more able than those particular students. So why would they go with someone who they didn't feel was as high as them? I know a lot of the kids knew from before that they were in the 'highest' group and I tried to have those stereotypes go away but they knew it. Once they know ... even the way I would mix them up, they would say, 'why is he in my group? He's never been in my group before.' A lot of them wouldn't go ask for help because they knew, so-and-so doesn't know this, why would I ask him for help. Even if that child had a different insight. We would do the same math journal items to see where they were all coming from, where they were all thinking and even if the lowest child answered it in the most logical way, no one would go to ask that child for help. Once we would discuss the problem and I would say well look at so-and-so's
answer they would say, "Oh I didn't think of that," but they still wouldn't go up to
them. They might go for help socially, but not academically.

Student behavior appeared difficult to change once the experiences that did not encourage
student interaction, or global student status (recognition of all students, by students as
having strengths) had been reinforced for a period of three to four years.

Student status, then, was facilitated by teachers and recognized by students.

Students sought out one another in accordance with their perceptions of other's ability.

This ability appeared to be informally anointed by other students or facilitated by teacher
action. The inability of student status to be utilized as an interactive tool appeared to be
thwarted by more traditional experiences over a period of time.

**Students' exploratory talk**

The interactions of students that enhanced learning through support of the concept
of student-as-peer; one who interacts with others sharing cognitive exchanges that
increase knowledge was grounded in the data of exploratory talk. Borrowing again from
Cazden (1988), exploratory talk was defined as the occurrence of learning without
answers being fully intact. The ability of students to seek out the missing information
through their verbal interactions was described in this theme.

Students were seen by their teachers as possessing the strategies necessary to seek
out information. Two teachers noted specific situations where students asked other
students for information. Mrs. Nen stated, "They've learned the strategies of what
questions, what open-ended questions they need to have to get the answers that we're
looking for." Beyond looking for answers, Mrs. Pao noted that, "They might even go to a
person that really doesn't know the answer but can help them figure it out."

A primary student characterized another aspect of exploratory talk; one who
utilizes resources as opposed to verbal interactions, in her response to the target interview
question of what she does if another student cannot give her the information needed.
Seated in her own classroom, she responded, "I can look if it's on the walls or the board and see if it's anywhere in the classroom."

An intermediate student captured the aspect of exploratory talk in relation to internal or self talk through application of specific strategies. In his journal he wrote,

I always work with my Literature Reading group (LRG). We always read quietly for 15 minutes without saying a word. We do this to learn how to read for understanding and to learn how to read for information. We read and write about what we read for 30 minutes then we go in the room to share what we read. We also evaluate what we read to the real world like if that can really happen to someone and the relationships between the characters.

Exploratory talk, utilized to foster learning when answers were not fully intact, emerged from the data as multi-dimensional. The students' talk included verbal interactions with others and non-verbal interactions with self and selected resources.

**Summary of Social Interactions Between Selected Students and Students**

A synthesis of this category, social interactions between selected students and students, was characterized by the students themselves as being natural and logical. This logic did not occur spontaneously, but rather was facilitated by the teacher's establishment of a supportive environment, modeling, and purposeful instruction.

Student interactions were demonstrated in behavior where students performed tasks together and assisted one another through their areas of strength, provided feedback through a variety of groupings or audiences, worked together to share cognitive information in order to increase knowledge, and sought and defined status and explored for clarification of information. The depth of interactions included the social as well as academic contexts. Collectively, the themes reflected diversity and density in the nature of student interactions within the concepts of student-as-teacher and student-as-peer. This diversification served to describe the impact of multi-age grouping in relation to interactions of students.
Social Interactions Between Selected Students and Teachers

Within the role of social interactions between students and teachers as impacted by a multi-age context, a learning environment where cognition and knowledge were developed, Vygotsky provided theory in which to ground this data. Theory that related to the zone of proximal development or the development of learning as determined by the individual cognitive level of the learner and the potential for learning under expert or adult guidance (Vygotsky, cited in Cazden, 1988). This adult guidance related to the interactions between students and teachers. These interactions demonstrated data relating to the learner (student) as well as the expert (teacher).

Two categories emerged in an analysis of the data regarding the nature of social interactions between selected students and their teachers in a multi-age context; teacher-as-facilitator and teacher-as-learner. Described through the voices of the students, administration, and teachers, these categories were uniformly described from a social constructivist perspective. The facilitation and construction of learning by teachers was depicted in relation to the interactions between students and teachers.

Teacher-as-Facilitator

The central theme of teacher-as-facilitator was noted by Mrs. Pao, a primary teacher, when asked how she interacted with the students in her classroom. As she described her role, she narrowed to her primary focus as facilitator. She saw herself, "Mostly as a facilitator, as the one who stands up there and asks the questions to get them to see where the answers are without telling them where the answers are."

Mrs. Iam, a veteran teacher at DES, summarized specific teacher interactions that took place when the teacher facilitated students' learning, "I mostly ask them questions, provide them ways of finding out things, and sort of step back and insert something every once in awhile."
Ms. Boe, a primary teacher, stated, "I never give them the answers. I might direct them to another line of thinking but I won't give them the answer." This role of questioner was important to the teachers' belief that learning was constructed through interactions between the learner and his/her misconceptions. If answers were given, the student may persist with his/her present misconception and thereby block the construction of new knowledge.

Within the context of the classroom, primary students described their teacher's interactions as being facilitatory in their intentions to expand thinking. An interview with one primary student characterized this event,

Researcher: What does your teacher do in your classroom?
Student: She teaches us to learn math, reading, and writing.
Researcher: Does she give you answers?
Student: Sometimes
Researcher: Oh only sometimes, how come?
Student: Because she wants us ... if we're writing she wants us to make up our own ideas.

While a concern that students might find this role of teachers frustrating, this student clearly understood the importance of finding your own ideas.

Teacher encouragement of student thought continued to weave through this theme of teacher-as-facilitator. An intermediate student described teachers' interactions to facilitate divergent thinking,

If someone needs help that no one else can help with she will help them. She'll try and explain ... she'll try and give it to them in an easier way. And for the whole class, she tries to give more than one explanation for it and umm like math and stuff, if someone has another way of doing it, she lets them show the class so that there's a bunch of different ways. Usually there's a couple of different ways .... like three or four different ways to figure out things. She lets them tell the class how they do it.

This student captured the value of teacher's efforts to encourage alternative problem-solving strategies to increase learning and knowledge through exposure to alternative ways of thinking.
Teacher-as-facilitator, then, was grounded in the data as characterized by both teachers and students. Additional validation of this category was provided by the assistant principal in his holistic description of teacher's facilitatory techniques,

Once again I saw very little negativism, very little put downs. Lots of "that's a good idea" a lot of "thank you for sharing that" It didn't seem like there were a lot of right or wrong answers. I saw a lot of teaching leading and probing to lead them to particular discussions or answers they were looking for ... without giving the answers.

Problem solving, questioning, and encouragement of divergent thinking emerged from the data as strategies utilized by teachers that defined their role of facilitators. Teachers were facilitators, guided by the belief that students construct their own knowledge, in part, through interactions orchestrated by the teacher.

**Teacher-as-Learner**

Emerging from the data relating to interactions of teachers with selected students in the classroom came the role of the teacher-as-learner. Teachers viewed themselves as acquiring new information in the classroom context as much as the children. Guided by their students' needs, interests, and decisions, teachers commonly expanded their own understanding of content knowledge. Ms. Boe, an intermediate teacher, described several initiating factors for this role,

I think that by the interactions that my kids have with each other and the decisions that they make, it makes me look at situations differently. I have to re-focus my lesson a lot because of where they are going or what they are doing. They can take the lesson a totally different way than I wanted them to and I would have to redo that and go in a different direction because of where they are going. I see them leading me when I'm teaching, not me leading them. They are taking me where they want to go.

Mrs. Iam, expanded the theme of teacher-as-learner to include the importance of recognition of student interest and experiential levels as she described the elements that shaped her learning, "If it's something that they're really interested in or will really work
and it seems to be something that everybody gets into or the majority of the kids, then I'm going to use it instructionally."

A specific incident provided by Mrs. Iam captured the facet of teacher flexibility that is necessary in order to follow the lead of student interest and experiences,

The whole experience began because we were going to study animals. They were interested in insects and spiders and basically bugs. So we began with bugs and lady bugs seemed to be a good example plus I could get a hold of about 1500 little lady bugs. They just got so into it. They observed the ladybugs doing a lot of things. They thought some of them had died and they hadn't. They were laying on their backs. They were really curious about this stuff. Both they and I checked out books about ladybugs. We found out that ladybugs play possum. That's one of their strategies to keep stuff from bothering them. They also go through a complete metamorphosis, which I didn't know and wasn't looking for at the time. This led to our next unit on metamorphosis, which initially I had no intention of doing.

Student learning appeared to increase when content was founded on student interest and the instruction began at students' experiential levels; levels where students had a foundation of knowledge on which to build new information. Ms. Boe and Mrs. Iam recognized the need to identify these experiential levels and begin or modify instruction to that point.

Teacher-as-learner required teacher observational skills and flexibility; observational skills that would alert teachers to students' experiential levels. Experiential levels provided the foundation for instruction and the cognitive hooks for student learning. Observational skills assisted teachers in identifying student interests which were used to motivate the learning process. Finally, teacher-as-learner revealed the need for teacher flexibility so that instructional modifications could be made to the learning event in order to accommodate experiential levels and facilitate student interest.
Summary of Social Interactions Between Selected Students and Their Teachers

The two categories labeled teacher-as-facilitator and teacher-as-learner represented ways the teachers at DES routinely interacted with students in their classrooms. The teachers facilitated student learning through their interactions of questioning, problem analysis, and divergent thinking behaviors. Teacher-as-learner, demonstrated through teacher flexibility, allowed students opportunity to explore their own areas of interest thereby increasing student motivation, while at the same time increasing the knowledge of the teacher.

Instructional Strategies

The description of instructional strategies utilized in a multi-age context where academic shifts have occurred over time was derived from interviews and observations with the teachers and reviews of standardized criterion referenced tests. The instructional strategies utilized represented teachers' beliefs that cognition, the readiness to learn particular concepts or skills as a result of development of the brain, evolved along a continuum or time line. In that each student progresses along their own cognitive continuum, instructional strategies were implemented by the teachers according to individual student needs. The development of this student cognition, recognition of individual student needs, and subsequent learning, was facilitated by instructional strategies that were process orientated, integrated, supported by questioning and accessed through collegial planning. Characteristics and application of specific instructional strategies, the implementation of instructional strategies that met individual student needs, and discussion of the academic shifts made over time, were described in the following categories as they emerged from the data. These categories were academic shifts, individualized instruction, questioning, process instruction, integrated instruction, flexible grouping, and joint planning.
Academic Shifts

The academic performance of students at DES was measured by the district criterion referenced test, a test designed to determine the effectiveness of instructional strategies. This study considered the test scores for one hundred and twenty students who had attended DES for the three years the school had been open. Eighty-nine percent of this group exhibited an increase in the categories of total math, total reading, or both (13 percent, 11 percent, 65 percent respectively) as measured by the district's criterion referenced test. For those students who did not show a gain in both total math and total reading, the lower score did not depreciate significantly (+/- 5 percent). Eleven percent of this total group demonstrated lower scores (> +/- 5 percent but < +/- 10 percent).

The implications of these results indicate that the specific instructional strategies utilized at DES positively impacted student learning. Traditionally, scores achieved by at-risk students reflect remedial instruction, adapted curriculum, or both. Grades are then weighted to compensate for these remedial modifications. While grades may, and often do, provide a measurement of growth in comparison to the criterion to the curriculum taught, standardized tests as demonstrated by criterion tests will not specify this growth. What is, can, and should be argued, is that growth should be measured in comparison to the individual. Current practices and politics do not provide an adequate or accurate tool or context for this to occur. The critical significance of the gains as measured by these criterion referenced tests is that the scores represent growth in gains comparatively measured against a district curriculum; a district curriculum taught utilizing instructional strategies that benefit at-risk students and actuate their academic growth.

Individualized Instruction

Student cognition and the readiness to learn particular concepts and skills as a result of development of the brain, occurred along a time line. In that this cognitive continuum was developmental in nature, accommodations were made by the teachers to
adjust teaching, learning and the curriculum to meet the individual needs of the students. Ms. Boe expressed how the curriculum boundaries were adjusted as a result of meeting individual student needs,

You look at the kids where they are and you take them from where they are and work with them from there. You don't group for straight third grade, they're all together. If there's a child at the ninth grade level you take him/her from there. If there's a child at the first grade, when he's/she's suppose to be at fourth grade, you work with him/her there. It's working with the kids' abilities."

This dynamic view of learning addressed the developmental nature of cognition in that students began learning at their own experiential level and proceeded to more difficult concepts as they acquired knowledge and understanding. In addition to this recognition of flexible grade boundaries, the importance of teacher attention to prior student knowledge was expressed by Mrs. Pao,

It's a more of a personalized way of teaching. Teaching specifically to the particular child's needs rather than doing a more generalized or just doing grade level skills; going through the curriculum. I look at a specific child and if they don't need a particular skill, if they already have that skill, let's say the use of capital letters or working on sight words; if they've already had those words or let's say if they're way below their level then I can do a more specialized instruction with them. I can work on words that they particularly need.

Within this multi-age context, where instruction was individualized based on prior student learning and experiences, teachers also recognized the need to utilize a variety of instructional methods. Instructional methods dictated by content as well as the individual requirements of learners. For instance Mrs. Nen stated, "There are also some times where I do direct teaching; I'm delivering information that they need." Instruction decisions, then, were made based on the cognitive developmental levels of students and the type of content being presented.

Acknowledging the value of how to learn as much as what to learn, teaching strategies were utilized by the teachers that encouraged critical, or higher order thinking skills, viewed content instruction as a process, integrated content areas to make them
meaningful to the learner, allowed for flexible grouping, and identified instructional goals through joint planning sessions. Some of those strategies including questioning, process instruction, integrated instruction, flexible grouping, and joint planning are discussed in the following sections.

Questioning

Questioning was a specific strategy used by many teachers that consistently emerged from the data. When asked about questioning strategies, Mrs. Iam said, "I ask the questions that are really going to take them further or that are where they are developmentally. Questioning helps them give me the answers or discover the answers."

As a result of this questioning process that encouraged students to discover the answers, students were actively engaged in learning. They exchanged ideas, explained their answers, looked for more than one way to solve a problem, and verified their own thinking rather than depending on the teacher to tell them if they were right or wrong. The teachers developed students' thinking and understanding by posing problems and asking questions that were relevant to real-life situations.

Mrs. Iam explained of a classroom captured in this phenomena,

The students were showing each other all kinds of things. They were asking questions of each other. They were excited talking about it, 'Come over here and look at this. Look at this bug over here.' They were cooperative, they were excited, and they were all together. Interacting to tell stories, to write things, to help each other; it really made a positive environment for them.

Questioning was also utilized to help clarify student intent, "Is this what you mean? Is this what you're trying to say?" was often heard in classrooms. In addition, questioning was used to motivate. When Mrs. Pao started on a unit about desert life she noticed several students chose to explore the animal life in the desert, "We brainstorm a lot and they sort of go off on the parts that they're interested in."
The questioning strategies of teachers provided opportunities for children to challenge themselves and others to higher level skills, clarify their ideas, discover relationships, and reach conclusions.

Process Instruction

Consistent with the acknowledgment of the value of how to learn, instructional strategies that dealt with the process of learning were seen as valuable and useful. These processes included reading, writing, or math that focus on the construction of student knowledge, rather than a finished product. Through interaction with concepts and skills novel to the learner, concepts and skills that may be contradictory to prior understandings of the student, an imbalance between past learning and acquisition of new knowledge was created. By taking students through a process, whereby they created their own understandings based on input of new information, they became able to resolve the conflicts, through instructional activities, that may have previously blocked the ultimate acquisition of the new concept or skill. The application and meaning of process learning was described in this category through examples of the writing process and a document review that described the interrelationship between reading and writing. Mrs. Iam began,

I can work the processes with anything. For example, the process of writing, you can write about anything, any content area. The process then helps students learn writing in a meaningful manner.

An intermediate student described her experiences with the particular process of writing and in so doing, characterized the learning that occurred,

The way we do the writing process is first we get our ideas down. We don't worry about spelling or how neat it is. We call it our first draft. We use the process if we are writing stories. After we are done writing everything we get a writing partner. How we do that is we get a partner in the class and we exchange papers. We check each other's spelling. We also tell our partners what is misspelled and if a word is misplaced. After that we bring our papers to the teacher to check it just to make sure everything is right. Then we get a piece of paper and write our final copy in our neatest handwriting.
This same process of writing, described by a primary student in her journal, exemplified the consistency of process instruction found throughout the school,

You think of what you want to write about and then you write a story. First you start with a rough draft or a sloppy-copy. And you go on to a final draft. You try to spell them the best as you can or look in a dictionary or the teacher will correct them or she will tell you to find them in a dictionary.

These experiences were chronicled by the assistant principal's observations validating the school wide consistency of process and individualized instruction utilized to meet students' needs,

They do a lot of writing ... a lot of communication of their ideas. So a lot of what I saw that was going on was a lot of journal writing. Kids doing a variety of different activities. Some kids who may have been finished with their journal writing may have been working on their reading, their vocabulary. A couple of other kids were working on the computer. So it seemed that there were a lot of different things going on but it all seemed related around writing. They were working on sequence of alphabet on the computer; how to use the keyboard. But then they were also using words from their journals as they felt comfortable. Where other kids were just getting ready to think of ideas for their journal.

Finally, process instruction related to reading as it did to writing. In a review of a document published by a group of teachers (family) at DES, both the concepts of process and integration of content were described,

Students learn to read and write by reading and writing. Writing is a process that begins with gathering information on topics (brainstorming), to actual writing (rough draft), to creating the final copy (revising, editing, and publishing). Reading is taught by meeting individual needs and styles of learners in conjunction with writing. Instructional methods that match the needs of each student are applied in a setting that immerses students in reading and recognizes that all will learn although the exact time of learning might be different for each child.

Teachers reported that they were able to implement process instruction throughout the curriculum. Process instruction, as it emerged from the participants' explanations of the reading and writing process, and validated by the assistant principal's observations, were consistently utilized throughout DES.
**Integrated Instruction**

Reflective of the belief that instruction should be meaningful, this meaning was accomplished by integrating content areas and building on the experiences and knowledge of every child. This integration was demonstrated through thematic units where classrooms were transformed to motivational learning environments such as a rainforest (environment theme), baseball stadium (systems theme), or a comfortable environment complete with chandelier, sofa and overstuffed chairs (self theme). Teachers expressed the value of integrated instruction in relation to the importance of meaning for students, "I think thematic teaching makes a lot of difference. It gives the students the 'hooks' on which to place what they are learning."

A frequently utilized instructional strategy known as the KWL (three columns with the headings: What I know. What I want to know. What I have learned) provided students opportunity to not only select their own topics of interest, but to direct the course of study (Ogle, 1986). Additionally, the teacher found the strategy important in determining students' experiential levels as well as their misconceptions. Misconceptions were important to expose in order to accurately facilitate the construction of knowledge. Mrs. Iam related,

I asked the students to tell me all they knew about the North Pole. It was very powerful to find out what they knew as well as their misconceptions. As a result of this 'brainstorming', our lessons were not only more interesting, but I also included information I would never have considered if I hadn't asked for the students' input first.

Student participation was not only important for the provision of experiential information but also to increase motivation for learning. A primary student captured this motivational aspect of her instruction, "Every two weeks we switch themes and right now we're learning about oceans and we have sea writing."

An intermediate class chose environments as their theme. Within this theme they studied the rainforest and in their study of the rainforest, they researched its inhabitants.
One student described the activity, characterizing integration of content (math/science), cooperative grouping, and divergent thinking, as well as motivation and experiential participation,

Yesterday we did an activity on taxonomy. I worked with [three students]. Mrs. Lee gave us a paper bag filled with weird bugs that didn't have names. We had to name the bugs. Not with names like Fred or Dan, but with names that fit their appearance. There were 20 species of bugs, but our group only had 15 species. After we were done naming the bugs we had to graph how many of each specie we had in our bag.

Classrooms at DES were organized so that they were child-centered (met the individual needs of students) and based on a theme. Subjects were taught together so that the students were involved in their own learning and skills were not taught in isolation. As individual needs and interests were addressed, student learning occurred.

Flexible Grouping

DES has operationally defined flexible grouping as working with students in 1) whole groups, 2) small groups, 3) peer tutoring, 4) cross-age tutoring, 5) interest groups, 6) cooperative groups, and 7) independently. The concept of flexible grouping was critical to this multi-age context. It was a differential factor between the teaching of parallel curriculums, as exists in combination classes, and a truly student oriented program,

Teachers organized groups according to differing criteria throughout the day. Mrs. Iam suggested that this grouping was both flexible and fluid throughout the instructional day, "I never have the same groups. They change daily, if not hourly. Sometimes I assign the students to groups for academic reasons; other times I let them choose their own groups for motivational purposes."

Besides working in a teacher directed group, students often worked in centers, without a teacher immediately present. Mrs. Pao described the variety of centers that
included all curricular areas, "Kids may be in centers writing pen-pal letters, or measuring, or using scales, or listening center while I'm reading with kids."

The flexible grouping patterns that included centers, peer, and cross-age tutoring expanded teacher contact time with individual students. Mrs. Pao explained, "I get a chance to work with all the kids. I break it down so I can work with smaller groups, where they need the special attention. Like I might do a mini-lesson in writing process."

Flexible grouping also included independent study that encouraged individual student reflection and exploration of individual interests. Mrs. Pao described how students worked independently. She said, "We will start with journal writing. We do response journals, where they write to me and I write back to them. When they are done, they go on to sustained silent reading."

An intermediate student validated, through his writing, the variety of grouping patterns used at DES,

These are the ways that we work at DES. The first way is with partners, the second way is in groups, the third way is independently, the fourth is in family/pods, and the fifth way is to work with the whole class/big groups.

A primary student provided insight into grouping and its relationship to instructional strategies, "We do Reading/Writing workshop. At Reading/Writing workshop we write and read and we do it by writing and reading. We can work with anyone." The importance of the awareness of grouping patterns on the part of students suggested that students were flexible in their own learning and that this variety of options assisted with the learning process.

The assistant principal explained the relationship between grouping and instructional design in his observation of cooperative learning,

As far as cooperative learning was concerned; kids working together; kids knowing what their jobs were; kids knowing how to work in a group ... I saw a lot of that. I saw a lot of the cooperative learning characteristics.
In conclusion, Mrs. Nen addressed the importance of flexible grouping, its processes and the impact on context, in her succinct description of multi-age,

Multi-age is teaching diverse kids and teaching them in a group together. It's just good teaching. I teach with a bunch of kids between five- and eight-years-old. I teach them in different groups. I teach them with different strategies. I teach them in different groupings, in ability, flexible, and cooperative grouping. I can tell you how I teach.

Flexible grouping was manifested in this context as whole, small, cooperative, interest, independent, cross-age, and peer groups. These grouping patterns increased interactions among students and expanded teacher contact time with individual students. Students internalized the type of groupings utilized in the classroom, thereby demonstrating an understanding of the importance to their learning. Flexible grouping was expressed as an integral part of this multi-age context; one that determined the essence of teaching a student centered program.

Joint Planning

Contractual agreement provided all teachers in the district with 250 minutes of preparation time a week. During this time, the students attended classes taught by specialists in the areas of music, art, library, and physical education. Block scheduling allowed for the provision of preparation time for DES teachers according to the following criteria: 1) each teacher will have at least one 50 minute prep time a day, 2) all teachers in the same family will have one common prep time per week, 3) prep times will fall approximately the same time each day, and 4) if more than one prep time occurs in one day, those times will run concurrently. This time was used by the teachers to plan instruction, promote peer and cross-age tutoring as well as provide for individual needs of students. The assistant principal noted,

What I saw was very effective planning on the teachers' part. A lot of the interactions were instructional so you know that the teachers had to be working/coordinating curriculum; coordinating ideas for sharing; how best can we
help this particular student. Younger kids working in intermediate classrooms. Taking time out of their classrooms to go and help in another classroom for whatever reason. Or the older kids going down to some of the other primary classrooms and helping out in whatever manner was necessary. So you know that planning had to take place in order for that to happen.

Meeting the individual needs of students was of paramount importance to the teachers in specialized areas; special education, and reading improvement (RIP). These teachers provided specialized instruction within the context of the regular classroom, holding to the belief of meaningful instruction through integrated curriculum. The reciprocity of joint planning was characterized by Mrs. Hay, the RIP teacher,

Working in the intermediate classrooms, I would work with the teacher teaching lessons. We were able to do this because I had one planning time per week with each teacher. I really enjoyed that and I think most of the teachers I worked with enjoyed that. Sometimes I would teach the lesson, sometimes the teacher would and I would assist, sometimes we would do team teaching. I found that to be very effective. It helps me to look for things in the rest of the kids, other than the targeted students, that would help me to identify what the teacher might overlook having to work with the larger class sizes. Sometimes I would have the opportunity to hear the kids read and see things that they would miss. Having two professionals in the classroom can really be a benefit.

Planning, then emerged from the data as fundamental to meeting the instructional needs of students in this multi-age context. Through opportunities to participate in joint planning, teachers were able to share ideas, facilitate peer (student and teacher) interactions, and develop collegial relationships.

**Summary of Instructional Strategies**

Teachers at DES did not view learning as sequential, hierarchical, or fitting into neat and orderly patterns. Rather, they viewed learning as occurring along a continuum or timeline. The facilitation of this learning occurred when instructional strategies were process orientated, integrated, supported by questioning and accessed through collegial planning. Central to these instructional strategies was flexible grouping which served as a
distinguishing variable in the definition of this multi-age context. In the context of these strategies, positive academic shifts were noted.

**The Influences of Social Interactions and Instructional Practices in a Multi-Age Context**

Lyons (1990) discussed how the necessity to offer text in a linear form often detracts from the complexity of concepts. Her nested entities construct implied that concepts exist in a "dynamic and interactive" (p. 8) relation to one another. The entities of social interactions and instructional practices did not exist as isolated concepts. Rather, these nested entities existed in a "dynamic, interactive" and contextual relation to one another. The dynamics of social interactions among and between students and teachers were nested within the instructional strategies utilized by the teachers and all of these components interacted with, and were impacted by the multi-age context itself.

The category that emerged from the contextual relationships of social interactions and instructional practices centered around the affective or emotional domain. This relationship was labeled *classroom as family*. Nested within this category were the concepts of student self-responsibility and age diversification. These concepts were considered nested concepts because this data emerged through investigations that were a result of the dynamics of social interactions between students and teachers as they implemented instructional practices.

**Classroom as Family**

The social interactions between students and teachers took place frequently within the instructional contexts of the classrooms. Teachers interacted with students, as described in flexible grouping, individually and in small and large groups. As teachers related their interactions with students during holistic instructional processes of reading, writing and problem solving, the concept of a family-like context emerged from the data.
The assistant principal noted how teachers created homelike atmospheres in their classrooms. He observed,

There's a lot of sitting on the floor ... almost like a homey feeling. Kids are sitting in a half circle, very close together. She was on the floor with them, same level as they were. Positive interactions going back and forth there. I could see the kids feeling very homey feeling ... a positive situation.

In his observation of this primary teacher's room, the assistant principal described the teacher behavior that characterized this interaction,

He does a lot more with one on one situations. He goes up to the kids or he has kids come up to him and he'll talk one on one or two on one or three on one. Very small groups sitting on the couch, once again, homey kind of thing. He made it a very family kind of thing, like talking to dad.

The physical setting of this particular classroom that supported teacher behavior and establishment of a home-like atmosphere was a direct result of the chosen, age-appropriate theme of self. Designed like the living room in a home, the teacher introduced skills and concepts in relation to the children themselves. This inviting environment helped establish meaning for these six- and seven-year-old students whose spatial and temporal understandings do not normally extend beyond self and their own immediate environment.

The design of the school itself was also capitalized upon to promote a sense of family. Built with four pods or wings that accessed a common internal courtyard, each pod contained both primary and intermediate classrooms. These groups of classes referred to themselves as a family and designated themselves as a cohesive unit through the adoption of a common name. Students remained with the same teacher for two years then advanced to a teacher within the same family. Students and teachers interacted frequently within this family constellation; family outings (field trips), family functions (fund raisers), and family performances (assemblies), thereby establishing a sense of belonging as well as a sense of individuality.

The contextual relationship of social interactions and instructional strategies were defined through the development of a classroom and school environment that was
supportive, positive, and comfortable. The complexity of the influences of social interactions and instructional strategies were further defined within the context through the interaction of thematic instruction and developmentally appropriate curriculum.

**Student self-responsibility.**

The concept of family did not exist, in this context, without the nested element of responsibility. Responsibility allowed students to take control of their behavior and their learning. Responsibility served to build self-confidence in children. Responsibility encouraged students to respect one another's individuality. Mrs. Nen characterized the rationale and development of this responsibility in addition to the concept of family, at the beginning of the year,

I basically told them, right at the beginning, when we established the rules together that we do a lot of things as a classroom together. We did writing activities on why we're here, what your responsibilities are in this classroom. Then through reinforcement and modeling and encouragement we shared a lot as far as why it was important to help people. Along the way, when we came across a problem we took it on as a classroom or in small groups; how we can work on things so they can take them back to their own personal experiences or personal problems. Each student is important. They all hold a particular role in our classroom as well as in society itself. They have control and choices to make.

This development of responsibility not only maximized a safe and nurturing environment through intentional instructional practices of modeling and encouragement, but provided students with experiences and skills that could transfer to real-life situations.

The importance of full participation on the part of each family member within the classroom was expected by the teachers. One primary teacher characterized her rational through her description of instructional practices in the classroom,

But they have the self responsibility to know that they have to learn and that everybody else in our classroom has to learn. So I give them that responsibility. That's really asking a lot too. When they finish the first thing to do is to go around and see if anyone else needs any help. All of the projects are not individual projects that you have to work by yourself. You have to work cooperatively together on things so it's not here's my paper and I have to do my work and you go
over there and do your work. If you need help, you ask three people first of all for help and then you come ask me.

Student self-responsibility emerged as a result of the influences of social interactions and instructional practices in a multi-age context. Social interactions included exhibition of respect for one another, responsibility for the learning process on the part of both student and teacher, and communication regarding problematic areas. Instructional strategies included modeling of desired expectancies by the teacher, cooperative learning grouping of students, and questioning skills by both student and teacher.

**Value of age diversification.**

Nested within the dynamics of classroom as family, the data revealed the importance of age diversification in the establishment of the multi-age context. The teachers capitalized on the diversity of age and experience to strengthen this family-like setting and encouraged student leadership. Mrs. Nen explained the value of diversification of age as she related how the students adjusted to classroom routine at the beginning of the year,

The younger ones take on more of the follower role than of the leader. It's ok to have some who aren't fully understanding of it. But that's one thing with multi-age, they have that first year just to get their feet wet and the next year they are ready to become the leaders of it. The younger kids mature so much faster, so by January sometimes as early as November, they fully understand it because they have those older children that are such models for them. They do become better leaders at it the following year.

Students were grouped according to diverse age configurations for both academic and social purposes. Mrs. Iam described the notion that students grouped in single-age configurations experience and then model the same developmental shortcomings. She went on to describe how interactions across age groups encouraged positive interactions among students,
It [age diversification] also helps because they can interact in different ways. They aren't all falling out of the chairs at the same time. They all aren't crying 'nobody likes me everybody hates me'... that kind of a thing. So they can interact with each other a little differently. If everybody has the same kinds of problems, and they do around the same age, they feed off of one another in a negative way.

De-emphasizing competitiveness as well as age boundaries was an element in this multi-age context. The value of age diversification as an entity that increased cooperation and decreased competitiveness in the classroom setting emerged from reflections of the assistant principal,

Obviously they can tell me academically where they are, but they can't always tell me their grade level assignments. I think that would be helpful to the kids in that it takes away competitiveness. You know, if a teacher expects them to do certain things regardless if they're a first or second grader, maybe that increases their own expectations.

Students organized according to diverse age groups was a descriptor of this multi-age context. This diversification of age encouraged student leadership, fostered positive student behavior through modeling of students at more mature developmental levels and perceived teacher expectation, and increased cooperative as opposed to competitive behavior.

Summary of Influences of Social Interactions and Instructional Strategies in a Multi-Age Context

The influences of social interactions and instructional strategies in a multi-age context revealed an important descriptor of that same context. The very thing that clearly defined this multi-age setting, age diversification, appeared to be responsible for the development of affective needs of students and the encouragement of their own responsibility.
Influence of Social Interactions on Selected Teachers' Constructs
About Classroom Instruction in a Multi-Age Context

Social constructivism, the theory in which this study was grounded, states that knowledge is developed best through a process of sustained social interactions. These sustained interactions included exposure to new input from others, contradictory ideas, and articulation of ideas to clarify conceptions as knowledge was constructed. Throughout the course of this study, teachers' constructs, as influenced by the social interactions and instructional strategies in this multi-age context, emerged, were defined and redefined, and impacted and clarified by the governance structure (Accelerated Schools process) of the school.

Teachers' constructs, in relation to this multi-age context, emerged through the observation of the social interactions between teachers and students and interactions with the instructional strategies utilized. As these interactions occurred, teachers' beliefs were exposed to new input resulting in a clearer definition of the support of beliefs characterized in the category multi-age grouping as advocate of beliefs.

The organizational structure of the school, that of the Accelerated Schools process, also impacted the influence that social interactions and instructional strategies had on teachers' constructs regarding the multi-age context. This impact was described through the category of Accelerated Schools impact and the sub-categories of unity of purpose, empowerment coupled with responsibility, and building on strengths.

Multi-Age Grouping as Advocate of Beliefs

The interactions between teachers and students were influenced by the teachers' beliefs as much as they were characterized by specific behaviors. During interviews and observations, data emerged that described the beliefs of teachers. Oftentimes, information was presented that suggested a shift in teacher belief as a result of their exposure to the
multi-age context. One veteran teacher expressed how the multi-age context provided support for her belief that students' cognition developed along a time line,

I think that's how I use to feel when I knew inside myself that kids needed the time to develop whatever it was we were trying to teach. Sometimes they weren't going to develop until they were ready to do it themselves. I mean they had to be given the time to develop. I think now we're giving them that time and we're not trying to force them into doing something that they can't do.

Another veteran teacher described her previous experiences working in contexts that required movement of quantities of students through programs as opposed to the multi-age context that adjusted program design to meet needs of students,

I always felt like I was more under pressure to take in as many kids as possible. Get them through as far as you could. At DES I think that just the whole atmosphere, that just the whole way we do things is more looking at the individual child. At their strengths, their weaknesses and looking just to that child rather than to the group.

That same teacher, while now supported by the multi-age context, revealed that her philosophy had shifted, partially as a result of context,

I think my philosophy has changed a great deal. Probably for several reasons, education, having had classes. At DES I've developed a more individual philosophy of my own because of the school philosophy.

The instructional strategies that most influenced teachers' constructs were characterized in the data as recognition of student's individual needs and learning continuums. The strength of these variables, in relation to teacher's beliefs, was expressed by novice teachers as instrumental in definition or clarification of belief systems. This resultant application was described by one such teacher,

I would push them a lot harder than I ever did. Because I felt .....some of that I think is experience too but I felt that I had a curriculum and that I only had to take them to the end of first grade and then that's all that I was responsible for. So I at least got them there and then said, phew, I at least got them there. But I don't feel that way any more because now I look at that full continuum and I look at that curriculum as a k-6 curriculum. I take the kids individually as far as he or she can go. I didn't push those kids at all before that. I can't tell you whether it would have happened if I had stayed in a single age class or not but it has really made me
open my eyes and see those kids as individuals because I was forced to look at them more as individual kids.

The notion of comprehension and recognition of individual student learning continuums emerged from teachers' reflections on the expectations of content coverage, versus individual student needs. Conflicts were noted by the teacher between the expectations for content coverage in a traditional (single age) class and meeting individual student needs in a multi-age class. The multi-age context facilitated this absence of curriculum boundaries and allowed for the recognition of individual student learning. The freedom within the context to allow for these varied learning continuums served to accommodate for the disequilibrium that occurred. Mrs. Nen stated,

When I had a single-age class I felt that I had a curriculum and that I only had to take them to the end of first grade and that's all I was responsible for. Now I look at the full continuum and I look at that curriculum as a K-6 curriculum. I take the kids individually as far as they can go. We look at the curriculum in terms of each child rather than the other way around. That's a different concept.

Multi-age grouping was overtly observed as a catalyst for change by the teachers themselves,

If it hadn't been for multi-age, I would have never had to look beyond what I was teaching. But also, I made sure those kids were ready for second grade and that's all I did. I didn't make sure that they were ready for third, and fourth, and fifth, and the rest of their lives like I do now.

The sustained social interactions that defined, clarified, or refined teachers' beliefs in a multi-age setting were grounded in those instructional strategies that encouraged knowledge of learning continuums and individual student's needs. These same teachers overtly recognized these variables as required and valuable for quality educational outcomes.
Accelerated School Impact

The multi-age context had an additional dimension of the Accelerated Schools organizational structure. While this governance structure was not the primary focus, an analysis of the data revealed that teachers' constructs and their subsequent construction of knowledge regarding this multi-age context were strongly influenced by interactions with the principles of the Accelerated Schools process. These interactions, as revealed through the data, were grounded according to the principles themselves; unity of purpose, empowerment coupled with responsibility, and building on strengths.

Unity of purpose.

The first principle of Accelerated Schools, unity of purpose, embodied the beliefs of the entire staff so that they worked towards a common goal. This concept of unity of purpose impacted the multi-age context as characterized by the assistant principal,

Oh yes. There was definitely a uniting of the staff. Actually that's definitely an area to be complemented on for DES is that I believe the staff has the beliefs. You could tell they knew what multi-age was all about. They knew what they had to do to get there but they also knew that it required everybody's input. Everybody's sharing of ideas. Like portfolio assessment had gone through stages of development and what was good as they got better and better. And you always saw the sharing within primary and intermediate. It wasn't this works for primary but not for intermediate. The strategies work for everybody and I think I didn't see any separation between intermediate and primary there was definitely a togetherness. They were a cohesive unit. When we talked about the families working together, they definitely worked together.

A novice teacher, while succinctly describing her perception of the schools philosophy, captured the complexity of the impact of Accelerated Schools on multi-age,

The philosophy is that we're there for the kids. I see that in every person that is there. But see, how do you separate that from Accelerated Schools? I have a hard time separating all that stuff. I mean we do so much so where does the responsibility lie. Maybe we wouldn't have gotten as far as we have if we wouldn't have had a little of all of it either. Maybe if we would have been just multi-age it would have been you up there going, 'Multi-age! This is what we want to do!' but
since we have the Accelerated Schools process to help us through it we all have buy-in and ownership of the program.

The beliefs and philosophy that were defined through the principle of unity of purpose appeared to clarify the concept and implementation of multi-age grouping. Staff members were united in their beliefs about education of children and the corresponding instructional strategies founded on how children learn and develop.

**Empowerment coupled with responsibility.**

The decisions that must be made in any classroom are numerous, simultaneous, and immediate (Good & Brophy, 1994). The principle of empowerment coupled with responsibility transferred to teachers as they implemented multi-age grouping. Teachers felt free to openly make decisions; decisions that were in the best interest of children. A primary teacher reflected,

> It [Accelerated Schools] has given all of us a buy in. We all know why we are supposed to do it and why we are doing it and it's not one person dictating to us. All the decisions we make we all have the philosophy that we are there for the kids. We all make sure that the decisions that we make are going to reflect the kids because that is our philosophy.

The degree of self-imposed empowerment increased over time. As teachers' confidence levels grew in themselves, so did their confidence in multi-age grouping. A primary teacher described such growth,

> I've seen ....we're past that experimental period. We're more confident in what we do now. We've looked back on our mistakes and we've learned from them. We've changed as far as our confidence in our program, our confidence in the way we teach. We've experienced enough kids to come through, and I think that means a lot. We can really honestly go back and evaluate ourselves now and see those kids who have been with us. Our first group of students are now fifth graders.

Empowerment coupled with responsibility carried with it the responsibility for assessment and accountability. This assessment and accountability were known as the inquiry process. This process encouraged the full examination of challenge areas, the development of sound hypotheses and action plans, the implementation of these plans, and
accountability as reflected through the cyclical process of internal assessment. This inquiry process was characterized as a critical element in the on-going implementation of multi-age grouping by one primary teacher,

Through the process we go back and look at what we've done whether it succeeded or failed and we make the changes as we need. We're continuously going back and looking back at what we've done and adjusting what we need to adjust. But not throwing things out because it didn't work. We go back and we look at it and we say ok are there any changes we can make? Did we hypothesize the correct way? Are we asking the right questions? Are we solving the problems that need to be solved or are they totally different problems. We're continuously looking at ourselves, is it benefiting the kids? Are we doing this because of the kids or are we doing this for some other reason? That's the only way you can grow if you evaluate.

Finally, this principle appeared to transfer to the students themselves. Ms. Fla, an intermediate teacher captured this in her reflections relating to cooperative learning,

The students have the control and the choices to make. I feel confident when my kids leave my room that they can continue with it somewhere else. It's not just because I'm standing up there saying, 'we must be cooperative.' I think it is something that they internally do because it becomes second nature to them. They've done it so long and know how to make their own decisions.

Empowerment coupled with responsibility was freely experienced by the teachers and transferred to students from their teachers. This ability and capability to make decisions within their levels of expertise grew with each experience. The decisions collectively made by the staff were implemented and refined through the inquiry process, a process that encouraged accountability for and to the decisions that were made.

Building on strengths.

The final principle was that of building on strengths. This principle embodied the belief that each person in the educational community had strengths on which to build, rather than weaknesses that needed remediation. The climate for this concept was first established by the principal who, by encouraging a risk-free environment, encouraged teachers to recognize their own strengths. A primary teacher wrote,
I don't think this would have worked without you, ... without that philosophy that was so strongly based 'it can work this way' and the support that it can be done. And like you always say, 'we're going to skin our knees but we can get back up' that ability ... that confidence that it is going to be ok and that we can get through it. Just to try it ... I mean it was very experimental we had a lot of ups and downs but if somebody else wouldn't have been out there so supportive of it also I don't think it would have been able to work.

Within this safe environment individuality was recognized and expressed,

At DES I think that just the whole atmosphere that just the whole way we do things is more looking at the individual child; at their strengths.

Building on strengths transferred to the students themselves. While captured in categories throughout this study, the notion of individual growth and recognition of developmental continuums again emerged in relation to the principle of building on strengths. Additionally, the teachers characterized the value of working with parents and their strengths. One intermediate teacher reflected,

In DES's multi-age classrooms, the teachers look at the individual children. They try to meet the needs of the individual children by beginning instruction where they were at. They would take them from where they are and what they already know and help them to grow. It's much more ... the teachers work with the parents I think a lot more than in other schools. A lot more communication through phone calls, letters, through parent meetings at the beginning of the year particularly. The teachers talk about what we're all about. The teachers look at what the kids can do. What they're good at and build on that.

The notion of building on strengths of the members of the educational community was first encouraged by the principal. Teachers were encouraged to take risks and attempt new teaching strategies. Building on strengths transferred to students as teachers recognized the value of individual growth and developmental continuums. Finally, the strengths of parents and family members were recognized through increased communication at the beginning and throughout the year.
Summary of Themes

Trends emerged regarding the nature of social interactions between students and students and between students and teachers. Instructional strategies utilized in the multi-age context were defined and the influences of social interactions and instructional strategies on teachers' constructs about classroom instruction were discussed in relation to these trends. Academic shifts supported the utilization of holistic and process approach instructional strategies as demonstrated in the improved student scores.

Originating from the data, though not an original research question, philosophical perspectives of teachers relating to pedagogy were revealed. These perspectives were founded in teachers' beliefs about students, themselves, and instruction and translated to the specific contextual delineator of absence of age and grade boundaries.

Examining the social interactions between students themselves and between students and teachers, descriptions were presented that characterized both student and teacher in reciprocal roles as learner and teacher. This reciprocity, and its embedded characteristics, reflected the diversity and density of the nature of these observed interactions.

Instructional strategies utilized in this specific multi-age context were described. The influence of these instructional practices and social interactions was expressed primarily through the affective domain. The category of classroom as family reflected the influence of these two interactions through the components of student self-responsibility, and age diversification.

Finally, the influence of these social interactions on selected teachers' constructs about classroom instruction in a multi-age context was revealed. Multi-age grouping was characterized as an advocate of beliefs centering around developmentally appropriate practices and teaching to individual student needs, serving as a influencing factor in the shift of teachers' beliefs. Accelerated Schools, DES governance structure, and its
concomitant principles of unity of purpose, empowerment coupled with responsibility, and building on strengths also emerged from the data as influencing teachers' constructs regarding the multi-age context.
CHAPTER FIVE

Summary of Findings, Working Hypotheses, Implications, and Further Research

This study examined the social interactions between students and between students and teachers, instructional strategies, academic shifts, the influence of social interactions on instructional strategies, and the influence of social interactions on teachers' constructs about instruction within a multi-age context. Data collected from field observations, document reviews, and interviews revealed trends in the interactions, instructional strategies and influences on teachers' constructs defined through a multi-age context. A grounded theory related to this data emerged through systematic conceptualization of conceptual linkages (Strauss & Corbin, 1990) within and between emergent categories of student/student, student/teacher interactions, instructional strategies, academic shifts, and influences of social interactions on instruction and teachers' constructs. A model reflective of the types of interactions and influences experienced by teachers and students that were enhanced by the multi-age concept was developed. This model described the phenomena as interactive; multi-age grouping impacted the interactions of students and teachers, these interactions impacted multi-age grouping through the accelerated schools process all of which then described the unique context of DES.

Within this chapter, a summary of the study findings is first outlined. A model related to the grounded theory of reciprocity of interactions and influences is then presented. Thirdly, working hypotheses generalized from the study findings are discussed. Finally, implications for educational application and future research are drawn.
Summary of Findings

Overview

Findings were reported according to (a) the context evidenced within DES, (b) the categories of social interactions between students and students, (c) the categories of social interactions between teachers and students, (d) the instructional strategies utilized in this multi-age context where academic shifts occurred (e) the influences, and their nested entities of social interactions and instructional practices in this same context, and (f) the shifts in teachers' constructs that became apparent as a result of the multi-age context and overlapping Accelerated Schools process. Findings reported in the study generally corroborated findings from the review of literature. Similarities and differences with the literature are discussed in each subsequent summary of findings.

Context

The teachers at DES looked beyond the individual student, to the context itself, as a determiner of student success. This context explained why some students learned faster or better than others (Mehan, 1981). Their stated beliefs and resultant mission statement served as a beacon (posted in every room of the school) to remind them of their commitment to an environment that adapted to meet the needs of students as opposed to students meeting a predetermined set of rigid expectations.

This commitment was founded on the beliefs that all children are capable of learning; and instruction must be based on developmentally appropriate practices. These practices recognized that student learning takes place along a continuum or time line and that this learning continuum spanned an age range of at least two years. These resultant beliefs, then, unlocked graded curriculum boundaries, enhanced opportunities for acceleration, enabled children to work at a variety of developmental levels without obvious remediation, and reduced the need for grade-level retention. Reflecting on this philosophical foundation, Mrs. Nen noted that these beliefs were internalized by the teachers and that their interactions served to apply these beliefs to student achievement,
"The teachers talk about what we're all about. The teachers look at what the kids can do. What they're good at and build on that. We talk about it all the time."

A context that built trust, encouraged risk-taking, and recognized the strengths of each individual student existed at DES (Dyson, 1987). This risk-taking was also encouraged by teachers of students. Mrs. Fla's intermediate students captured this trusting, safe environment as they developed their ethics' rubric. In their description of the standards, they utilized words and phrases such as trusting one's own ability, responsibility for learning and helping others to learn, and freedom to take a chance and be wrong without repercussions. Student interactions in the classroom reflected encouragement of questioning of unclear or disparate concepts, and teachers purposefully staged situations that would require problem-solving and communication between students and students and students and their teachers. Ms. Boe captured this belief, "Kids have to be successful at their own ability, to take risks and know that the risks are safe even if they fail. That they are successful, even in their failures, by trying."

The beliefs and philosophy, then, of teachers and administration served to develop the foundation for the context as it existed in DES. These beliefs maximized a safe and nurturing environment which promoted the physical, social, emotional, and cognitive development of young children.

Social Interactions Between Students and Students

The nature of the social interactions between students and students was described by the students themselves as being natural and logical. The students viewed their interactions as necessary and appropriate to the learning process as stated by one intermediate student, "I like it because you learn faster and you get to work in groups and talk about what you are doing."

One component of these interactions was that of communication. Communication included exploratory talk as a means of gathering missing information and interaction with
a variety of audiences as a means of gathering feedback (Cazden, 1988). As an outcome of this communication between members of the classroom (Brufee, 1984), students had opportunities to explain the content in their own words and access and use the content information in appropriate application situations in and out of school (Bereiter & Scardamaia, 1987).

These opportunities to use the content information in situations in and out of school were provided, in part, by the students' participation in entrepreneur projects. In these projects students researched, produced, and marketed a product or service. Interviewing for and appointing a board of directors was one such opportunity where the important content relating to economics was communicated between the students. Oftentimes, the community business partner provided opportunity for the student business to be taken outside the school setting.

Additionally, each classroom had a selected theme or topic through which students utilized exploratory talk to explain what they knew, what they wanted to know, and what they had subsequently learned as a result of instruction (Ogle, 1986). The importance of this strategy not only related to the act of exploratory talk as a means of gathering information, but also to the importance of meaningful connections made by the students to their prior knowledge. As primary students, for example, brainstormed what they knew about the desert in which they lived, information evolved regarding their previous experiences with desert flora and fauna as well as connections to related information stemming from literature or science content areas.

The development of cognition, learning and knowledge took place as a result of social interactions between students and students (Cazden, 1988). These interactions of students allowed for the development of cognition, learning, and knowledge through interactive communication with one another in response to cognitive dissonance presented by the teachers. The cognitive dissonance presented by the teachers in response to the interactions of students was explained by Mrs. Boe,
In my instruction I can only go so far. I help them but I also let them go off on their own. If they are doing the assignment wrong, they are going to learn. Their decision to do it that way is going to have a consequence and they are going to learn through that. Instead of asking me for the answer, I won't give it to them, I don't believe in giving them answers even if they are on the wrong track. I might show them another way to get to the answer, but I won't give them the answers, I let them figure it out for themselves.

The importance of facilitating opportunities for students to come face-to-face with their conceptual misconceptions allowed teachers opportunities to assist students in constructing accurate knowledge. Construction of knowledge supported powerful instructional strategies utilizing questioning and process orientations.

Central to the interactions between students in this multi-age context was the concept of cognitive dissonance where students often confronted their own mistaken conceptual notions. Cognitive dissonance was supported by students' complementary roles (students working together), as well as instructional strategies, "where experimental evidence was being generated and where managerial skills were required, by assuming complementary problem-solving roles, peers could perform tasks together before they could perform them alone" (Cazden, 1988). Throughout the instructional day students interacted in small groups or pairs, discovering answers to problems with few clear-cut answers, applying instructional strategies that required cooperative assistance from one another, and where the teacher functioned as a facilitator posing questions designed to expand the students' thinking until they reached their own conclusion.

Student communication that reflected "...sustained dialogue or discussion in which participants pursue a topic in depth, exchanging views and negotiating meanings and implications as they explore its ramifications" emerged from the data (Good & Brophy, 1994, p.419). This student talk allowed the children to assume conversational roles rarely available to them in talk with teachers (Cazden, 1988). As student status emerged within the classroom and student strengths were capitalized upon, the students were more likely to clarify or challenge ideas through questions, to offer suggestions, or to explain ideas to
less-informed others (Forman & Cazden, 1985; Phillips, 1985). Peer interactions enhanced the development of logical reasoning through a process of active cognitive reorganization again induced by cognitive conflict (Perret-Clermont, 1980). This cognitive reorganization was observed as students clarified concepts for one another and explained their processes of thought. The impact of this communication, in relation to the social interactions among students was summarized by Ms. Boe,

I see students communicating a lot with each other; they question one another. In math they will show them with the manipulatives because I've told kids they cannot give them the answers but that they can show them how to get the answers. I've actually seen the kids take one another outside in the hall and discuss privately what they were talking about.

Student-as-teacher was also expanded through the theme of one's relationship with audience. This relationship was first expressed through the recognition that student motivation was increased when the interaction with audience (the tutor, peer, or expert) was appropriate to the task and included choice. The multi-age context provided support for these interactions through grouping patterns and instructional strategies, and operationalized student-centered beliefs of teachers.

Student/student interactions in complementary roles, and relationship to one's audience included a rich mixture of interaction and instructional focus. Students assumed problem solving roles, received feedback from their audiences (student-as-teacher), and performed tasks together (student-as-peer). This behavior occurred without teacher assistance and held up over time.

Social Interactions Between Teachers and Students

Observing the interactions between students and their teachers in order to assess the impact of multi-age grouping, Dyson (1987) not only described the need for students to interact in order to understand their world, but also addressed the teacher's need for observational time. She stated, "To appreciate children's efforts, adults need viewing
space. That is, they need opportunities to examine these constructed behaviors holistically, so that the functions of those behaviors can be clarified" (p.57).

This viewing space, or observational time was grounded in the data that represented teacher-as-facilitator. Teachers and students shared responsibility for initiating and guiding learning efforts (Good & Brophy, 1994). The teacher acted as a discussion leader who posed questions, sought clarifications, promoted dialogue, and assisted the students in recognizing areas of consensus and of continuing disagreement (Good & Brophy, 1994). Through this facilitation of learning, the teachers provided the scaffolds that are represented in the literature as forms of support provided by the teacher (or another student) to help students progress from their current abilities to the intended goal (Rosenshine & Meiste, 1992). Most importantly, this viewing space provided the opportunity for the teacher to collect data regarding student progress. Data critical to the on-going instructional planning of teachers necessary to meet individual learning needs of students.

In the 1985 report, *Becoming a Nation of Readers*, the call was for teaching reading as a sense-making process of extracting meaning from texts that are read for information or enjoyment. The emphasis, then, was on reading and interpreting text rather than on practicing fragmented skills. Skills such as decoding, blending, and noting main ideas were taught, but this instruction was done within the context of reading for meaning. Viewing space allowed the teacher the opportunity to analyze the complexity of these skills as they should mature in the learner.

This interaction of student and teacher was continuous and reflective and demonstrated, through the data, the mutual negotiation of curriculum (Rubin, 1990). This negotiation between student, teacher and context not only allowed students opportunity to explore their own areas of interest, but also increased the knowledge of the teacher. Hence, teacher-as-learner occurred within the multi-age context through interactions as suggested by Mrs. Pao,
I think that by the interactions that my kids have with each other and the decisions that they make, it makes me look at situations differently. I have to re-focus my whole philosophy on education a lot because of where they are going or what they are doing. Even with my lessons, they can take it a totally different way than I wanted them to and I would have to redo that and go in a different direction because of where they are going. I see them leading me when I'm teaching, not me leading them. They are taking me where they want to go.

The functions of teachers' viewing space, then, were to provide opportunities for observation of student interactions to facilitate learning. Through these observations and interactions, teachers increased their own knowledge of student (teacher-as-learner) and promoted an interactive teaching model (teacher-as-facilitator).

**Instructional Strategies Utilized in a Multi-Age Context**

The instructional strategies that emerged from the data in this multi-age context were grounded in the research relating to brain compatible instruction (Caine & Caine, 1991; Hart, 1983; Smith, 1990), process approaches (Goodman, 1986; Good & Brophy, 1994), and developmentally appropriate teaching (NAEYC, 1986). The description of these strategies added an important dimension to the present body of research on multi-age grouping. A dimension that provided a critical distinction between the parallel curriculums (two or more specific grade orientation curriculums taught in the same setting) often found in combination classrooms and the interactive, open-ended curriculum described in this multi-age context.

The teachers at DES did not view learning as sequential, hierarchical, or fitting into neat and orderly patterns. They recognized that classrooms did not operate primarily on a transmission teaching model (Good & Brophy, 1994); the teacher being the keeper of knowledge. Rather, they viewed learning as dynamic and occurring along a continuum or time line relating to cognitive maturity and developmental appropriateness for learning and being interactive in nature (NAEYC, 1986). Mrs. Nen commented,
You don't group for straight 3rd grade, they're all together. If there's a child at the 9th grade level you take him from there and work with him there. If there's a child at 1st grade, when he's supposed to be at fourth grade, you work with him from there. It's working with the kids' abilities.

The importance of the relationship of learning continuums to instructional strategies within the multi-age context was succinctly stated by Mrs. Iam,

It makes the teachers work with the children to their ability. The students have to be given the time to develop. I think now we're giving them that time and we're not trying to force them into doing something that they can't.

The facilitation of learning occurred when teachers recognized the individual needs of students through application of instructional strategies that were integrated and process orientated, supported by questioning and implemented through flexible grouping of students. Within this multi-age context where positive academic shifts occurred over time, teachers utilized specific strategies; questioning, holistic reading approaches, hands-on math and science, cooperative grouping, and on-going assessment, that encouraged critical, or higher order thinking skills and process analyses. As a result of an understanding of how learning occurred, instructional strategies that were holistic, open-ended and reflective were utilized.

These results, through description of types of instructional strategies utilized, supported and expanded the synthesis of research presented by Pavan (1993). This research provided evidence that in heterogeneous, multi-age classrooms and schools, students perform as well or better than students in traditional settings, "most studies found that multi-age grouped students performed better academically, both in reading and in math; some found them doing approximately the same; and only one found students not doing as well academically" (p.98).

Integrated, process orientated instruction.

The integrated instruction implemented by the teachers at DES gave emphasis to the significant aspects of growth and human intelligence, helping students see the
connections between separate subjects. The interrelation and integration of these strategies facilitated academic growth through active construction of meaning so that students found purpose in their studies.

Additionally, teachers viewed curriculum from a process orientation, acknowledging the value of how to learn as much as what to learn. Mrs. Nen explained, "Instruction was done thematically. It was implemented using individual assessment, open-ended questions, hands-on experiences." This thematic construction of learning was understood as a self-regulated process of resolving inner cognitive conflicts that often became apparent through concrete experience, collaborative discourse, and reflection (Brooks & Brooks, 1993). Students learned not only the individual elements in a specific content area, but also the connections among them. The understanding of these connections allowed students to explain the content in their own words and access and use the content information in appropriate application situations in and out of school (Bereiter & Scardamalia, 1987). An intermediate student captured this notion as he explained how he came to an understanding of fractions when planting seeds that would be used in their mini rainforest,

We were studying the rain forest. We had our whole room set up with the vines and stuff. We planted plants in glass cases to make mini rainforests. I learned about fractions. I didn't know what one-fourth was until I came to this school. I learned by using an egg carton and pompoms and a string to divide it. We put the seeds in the egg cartons.

The power of this self-regulation, when combined with instruction that was meaningful and connected, resulted in "individuals interested in a task or activity, paid more attention, persisted for longer periods of time, and acquired more and qualitatively different knowledge than individuals without such interest" (Hidi, 1990, p. 554).

Questioning.

The instruction at DES fostered in students the skills and attitudes of reflection so that they were able to think critically, creatively, and affirmatively. With a focus on the
extension and clarification of student thought, questions were divergent and designed to develop understanding of the powerful ideas that anchored the learning networks (Hart, 1983; Kovalik & Associates, 1991). Mrs. Pao described her rationale for effective questioning,

You really have to be open-ended with your curriculum .... with the questions you ask, with the assignments you ask the kids to do so that you are only expecting them to work up to their potential, not the next child's. You want to be able to get them to stretch in their own thinking.

Questions were asked by the teachers that helped students search for and discover answers. When teaching concepts, patterns or abstractions, teachers' questions guided students into discovering new dimensions of a problem or ways of resolving a dilemma. Mrs. Iam explained her decision-making process for questioning,

I listen to what they say and for indications that they're thinking beyond the initial concept. They may not be able to express the concept but a well designed question can help them put together what they know.

Questions also played a vital part in the establishment of meaning for the student. Students were asked questions that would connect them to the learning experience through prior experiences, associations, and/or relation of content presented to the students' own sphere of interests, concerns, and problems (Withall, 1987).

The ability to reflect upon verbalized experiences was seen as the heart of higher-level cognitive functioning (questioning strategies) by researchers and theorists whose work has significantly affected current views on children's language and learning (Bruner, 1984; Piaget & Inhelder, 1969; Vygotsky 1962, 1978). Questioning functioned in this multi-age context as an instructional strategy integral to the academic achievement of the targeted student population.

Flexible grouping.

The last century has been the only time throughout the history of education when children were consistently grouped and administered in structures that separated and
segregated them according to a calendar criteria (Anderson & Pavan, 1993). Segregating agemates, a practice based on an industrialized model, was not implemented as an innovation that would be good for children, and had no basis in theory or pedagogy (Anderson & Pavan, 1993). In fact, segregating children by ages assumed a teacher-centered classroom style and assumed children of same ages were the same in development and needs (NAEYC, 1986).

Flexible grouping provided for open-ended curriculum implementation. It allowed for revision and continued refinement of the instruction itself, and it provided for open access to all students, so that students were not tracked into dead-end grouping.

The teachers at DES institutionalized their operational definition of flexible grouping. Although there were times when the teacher directly taught a lesson to the entire class, it was also likely that during the day that teacher's contact with students was expanded by a variety of learning and teaching contexts. Examples of varied context involved students clustered into centers to work in pairs or in small groups, without a teacher immediately present; teachers meeting with individuals or small groups; and children engaged in independent study. Mrs. Hay described,

Before it was always a small group situation where now it's more one-on-one or smaller groups. However, with the multi-age I've found that... I don't have people strung out so far by themselves and alone. One up here and one down there, you still have the same continuum of developmental levels but there are more kids at each level and they don't feel so alone like they're out there in left field. Particularly if it's a child who has moved beyond.

The instructional strategies that occurred within this multi-age context enhanced construction of prescriptive curricula (Goodson, 1990) and recognition of individual differences that adapted school learning to different abilities, experiences, interests, and socio-economic backgrounds of children (Wang, 1990). Authority for constructed knowledge resided in the arguments and evidence cited in its support by students as well as by texts or teacher; everyone had expertise to contribute (Good & Brophy, 1994).
Because the acquisition of knowledge is infinite (Smith, 1990), one of the most fundamental features of multi-age grouping was that it did not presume that education can cover everything. Expanding on this idea, Mrs. Iam said, "I can take my time now, I don't feel like I have to cut open their heads and pour the information into their brains so they can go on to the next grade." In a race to cover more material, facts or information, there was little, if any, attention given to more substantive, critical thinking or higher-order thinking skills. Such skills involved analysis, comparison, evaluation, synthesis, and other processes that required more than merely scratching the surface of facts; they were essential in enabling learners to be in charge of their own, continuous, lifelong learning, and for participation, perpetuation, and promotion of a democratic way of life (Anderson & Pavan, 1993). The teachers at DES entered with, expanded upon, and internalized these fundamental presumptions. Mrs. Nen succinctly synthesized these tenets in her description of teaching,

Multi-age is teaching diverse kids and teaching them in a group together. It's just good teaching. I teach with a bunch of kids between 5- and 8-years-old. I teach them in different groups. I teach them with different strategies. I teach them in different groupings, in ability and in flexible grouping, in cooperative grouping. I don't just prepare them for third or fourth or fifth; I prepare them for life.

Influences of social interactions and instructional practices.

Multi-age grouping in which children of more than one grade level or age level are deliberately grouped to form a single learning community, is a logical and time-tested manner of educating children (Anderson & Pavan, 1993). Building on the strengths of family structures, and the strength by which those structures have proven successful for thousands of years, family grouping in schools also has a logical and promising foundation (Anderson & Pavan, 1993).

The influences of the social interactions between and among students and teachers and the instructional strategies in this multi-age context resulted in a powerful learning
environment, a learning environment where, as a result of the influences of these two features, participants demonstrated concern, care, and responsibility for self and others and valued diversity.

Classroom as family.

Knowledge is gained within an instructional and social setting rather than being internally organized (Mehan, 1981). Knowledge cannot be mandated or imposed on one person from another. Success or failure in schools, therefore, may be due to matches or mismatches between teachers and students.

Students and teachers at DES collaborated by acting as a learning community that constructed shared understandings through sustained dialogue. Mrs. Iam suggested her position in this learning community,

I'm beginning to feel like one of the group rather than the teacher at times, which is ok. As long as they don't quite forget who I am (laughter) But it's like ... they will just stop and go on with their agenda and I'm glad that they feel comfortable enough to do that. They just stop and tell the story or raise their hand.

The context of classroom at DES, then, was comfortable and supportive so that students and teachers functioned together to allow for the acquisition of knowledge.

Student self-responsibility.

Scaffolds are forms of support provided by the teacher (or another student) to help students progress from their current abilities to the intended goal (Rosenshine & Meister, 1992). Closely associated with the concept of scaffolding is that of gradual transfer of responsibility for managing learning (Good & Brophy, 1994). As students developed expertise in a given area, they began to assume responsibility for their own learning by asking questions and working on more complex tasks with a greater degree of autonomy. This concept of student-self responsibility was expressed by the students themselves,
You learn faster. You get to work in groups and not by yourself. I learned faster because all of my classmates helped me with stuff I did not know and I taught them stuff they did not know. We learned math by making games out of it.

Self-responsibility in students was not only demonstrated in the students' classroom setting but also extended to the school as a whole. Students frequently wrote the principal, offering suggestions for improvements in their personal learning environments. For example, one intermediate class suggested a change in the lunchroom routine that resulted in less congestion and faster distribution of lunches. This was a spontaneous discussion, as reported by the teacher, resulting from this particular class frequently waiting an extended period of time in the lunch line. Another example of student self responsibility centered around a primary group of students. Studying insects, this class frequently visited the rose bushes in the courtyard area. Required district notification of insecticide spraying resulted in spontaneous, somewhat frantic requests of the principal to forbid spraying of those rose bushes. Again, these requests were not initiated by the teacher, but came about as a result of the students' in-depth investigation of and commitment to a particular area of study.

Student self responsibility developed, then, through scaffolding provided by both teachers and students. This self responsibility resulted in powerful learning experiences that were structured around students' interest and natural curiosity (Horn & Murphy, 1985; Schunk, 1985)

Value of age diversity.

While astute teachers have always recognized the breadth of diversity in any class, in this setting diversity was considered a classroom strength and was central to making the learning community effective. In this multi-age context, the teachers capitalized on the diversity of age and experience to strengthen the environment both academically and socially. Getting to know the ways children differed in skills, experiences, and natural talents benefited the learning community (Good & Brophy, 1994). In the multi-age
classroom, the teachers readily utilized the varied and more diverse student strengths and abilities available to them. Mrs. Pao described this occurrence as partially a result of the students remaining together for a period of two years,

The kids see that they are a group. Because they stay together for two years I think they become like a family instead of a separate individual in the classroom. They're together and I just think they want to see everyone succeed in there and they know the expectations are different so everyone can succeed. I've made that clear to them. It doesn't matter what they are doing that they all can succeed at their own level.

While these different learning-teaching contexts can be observed in many single-age, whole language or process classrooms, the difference in this multi-age setting was that the groups contained children of different grade levels, resulting in older children modeling for, helping, or even teaching other students as expressed by an intermediate student,

I think that being in a multi-age school I learn faster. If I didn't learn something last year I can learn it again this year from a younger student. This year I learned average and some new third graders helped me!

This cross-age collaboration was productive for both the helping students and the student being helped. The children being helped had a peer role model and received peer explanations, which were very different from adult teaching. One primary student reflected, "I worked with Andrea. I wrote a story about a spider. We did it by talking first and then writing."

Students had multiple teachers. The helping children were stretched as they brought their knowledge to a conscious level, chose language for explanation, and developed an increasing sense of responsibility and self-esteem. An intermediate student described this as she related her experiences in tutoring a younger child in reading, "Today was good. When we were reading the book, she was answering my questions right. When I cut out the good stuff (referring to the motivational activity), she was still asking good questions." Helping children were constantly reminded of what they know, and developed
attitudes of themselves as capable individuals. Mrs. Pao commented, "They see themselves as learners, it really builds self esteem."

Without attention to age, there were times when students worked and learned together, "We work in centers. What we do in centers is that we have five other people to work with," and times when they assisted one another one-on-one, "I went to Billy for help. He was in this class last year and I knew he could help me." The learner was provided a context in which his or her tasks made sense as supported by the thematic instruction data, an opportunity to decide what he or she would be learning to do in the near future, and an awareness of teaching and learning expectations. An intermediate teacher stated, "I ask them to fill out their 'plan for the day' document so that they become aware of their learning needs."

When children were grouped diversely by differing ages, there were inherent assumptions that were more consistent with our knowledge about what is good for educating children, and the nature of child development (NAEYC, 1986). This diversified age grouping occurred consistently and encouraged spontaneous interactions in naturally occurring groups thereby realizing the benefits of age spread (Katz, 1990).

**Influences of Social Interactions on Selected Teachers' Constructs about Classroom Instruction in a Multi-Age Context**

The categories of influences on teachers' constructs about classroom instruction in this multi-age context led to a constructivist notion of teaching and learning. Social constructivists have paid attention to the collective act; that act being the interaction between participants in the learning event (Good & Brophy, 1994) as grounded in the data relating to student/student, student/teacher interactions. This interaction was synthesized by Mrs. Pao,

When I think of multi-age grouping I think of two things; first the kids' relationship with me. They'll have me for two years. Because of that, I'm forming a stronger bond with them. They know me. I know how they learn and where they are coming from. I think you grow closer to the kids. Secondly, I think of it as the
social connection with the children because they are at different levels, different
groups. A normal classroom would be at different levels but the experiences are a
little bit different too. With a range of children you can group them various ways.
So they are having a different social connections with children plus a stronger bond
with me as well.

Mehan's (1981) theory of social constructivism emphasized that the development
of cognitive processes occurred within the individual through the internalization of
interactions between learners and more capable teachers. Both the teachers and the
administration viewed the multi-age context, embedded within the Accelerated Schools
process, as agents enhancing teachers' constructs about classroom instruction and the
resultant student learning.

Constructivists state the need for a process of instruction that involves making
connections between new information and existing networks of prior knowledge.
Construction of knowledge is smoother when learners can address new content in the
context of relating it to existing background knowledge or experiences. New content is
not first understood in an abstract way and later related to existing knowledge. Rather, it
is interpreted from the beginning within contexts implied by that existing knowledge
(Good & Brophy, 1994).

Multi-age grouping, as a facilitator of change, was grounded in this data in that the
connections made by teachers regarding implementation of instructional strategies
involving prior knowledge, or beliefs, had been thwarted in other contexts. Mrs. Iam, a
veteran teacher, noted this in her description of past teaching experiences,

I think thematic teaching makes a lot of difference but I think it's more the way
we're going about it. I always connected everything I did as much as I could. I
couldn't always connect it because I had to use certain basals and things to that
effect and the story may not have had anything to do with ladybugs but we read it
anyway.

Classroom strategies that focused on individualization of instruction also
represented a shift or perceived difference on the part of teachers regarding their
constructs. Mrs. Boe expressed these differences as she perceived other teachers' rationale for not individualizing to meet the needs of students,

I think it was easier. To keep the kids all at the same level....it was just easier to give them something to work on and not have to worry about where they were. And then the teacher says this child failed but it wasn't because of me it was because he couldn't do the worksheet or he couldn't read the story. So I think the teachers were putting the expectations on the kids, not on themselves. They weren't saying they were the ones that failed, the kids failed.

Conversely, the influence of multi-age context on the instructional strategies of novice teachers, with this context as their only experience base, did not appear to cause a shift primarily due to the match between their teacher preparation program and the instructional context. Mrs. Pao noted,

I wouldn't teach any different than I teach right now. It's been good for me, it's really opened my eyes. But there wouldn't be anything I would do any differently and there's no reason to. You can teach the same way. There should be no difference.

The shift in constructs regarding instructional strategies emerged from the data surrounding curriculum, grounded in the literature by Goodson (1990) who stated, "We need an understanding of how curriculum prescriptions are in fact socially constructed for use in schools...a focus on the construction of prescriptive curricula and policy coupled with an analysis of the negotiations and realization of that prescribed curriculum" (p.22). Teachers described their shifts in relation to the curriculum as prescribed by the multi-age context. Mrs. Iam captured the evolution and importance of this socially constructed curriculum on the part of students,

The kids get excited about what they're learning holistically and I don't think I ever said we're going to study cycles this year for a topic. So I think that part gets them caught up and they're always thinking about that one area. Not being afraid to let them interact and to take some time to learn.

Effects of more rigid curricular expectations and education, related to the same types of experiences, were noted by Mrs. Pao,
Well I think that as a first year teacher, I was exposed to a lot of that in my training, although teachers aren't trained they are educated. The first year of teaching was the best education that I could have. Even though I learned a lot from my studies, I learned more the first year about where the students are going. In college you don't learn real life. I think from student teaching you learn but not necessarily where I was. You know, I learned about kids and I had the contacts with those kids and that was good, but as far as learning about setting up centers or doing something like that, I didn't learn. I had to learn that by myself.

Perhaps the most critical influence of social interactions on selected teachers' constructs about instructional strategies in a multi-age context occurred as a result of age diversification of students. Grouping students of various ages together, on the premise that this group of students develop along the same expanded cognitive continuum, required teachers to teach to this developmental continuum rather than to a predetermined curricular time-clock. Teachers became adept at open-ended tasks, tasks that may have originated from the same instruction or activity yet held different expectations for outcome dependent on students' developmental levels. The longer a teacher truly recognized and taught to learning continuums, the more student centered became his/her teaching.

Attention to discrete curricular requirements were replaced by learning styles and time lines of individual students. Mrs. Hay, a veteran teacher having experienced multi-age grouping for two of her near twenty years described this conclusion,

It's more of a personalized way of teaching. Teaching specifically to the particular child's needs rather than doing a more generalized or just doing grade level skills; going through the curriculum. At DES, I look at a specific child and if they don't need a particular skill, if they already have that skill, let's say the use of capital letters or working on grade level words, if they've already had those words or let's say if they're way below their grade level then I can do a more specialized instruction with them. You look at the kids where they are and you take them from where they are and work with them from there.

Teachers' constructs about classroom instruction were validated or shifted as a result of the influence of social interactions. For the veteran teacher with more traditional teacher education courses and experiences, teacher construction of knowledge came from interactions with new or reinforcing experiences, in the form of social interactions, from
students, other teachers, or their own belief system. For the novice teacher coming from a teacher education program that emphasized a constructivist philosophy, the multi-age context and resultant social interactions served to validate their beliefs and provide a dynamic context in which to apply educational methodologies.

**Accelerated Schools Impact**

Multi-age grouping, in conjunction with a site-based, shared decision governance structure impacted teachers' constructs about students, learning, and instructional practices. The principles of this structure, unity of purpose, empowerment coupled with responsibility, and building on strengths transferred to the school setting.

**Unity of purpose.**

Teachers exhibited unity of purpose in relation to expectations for students (Hopfenberg, Levin, & Associates, 1991). This unity of purpose was a reciprocal concept in that school philosophy impacted personal philosophy which impacted school philosophy, and so on. Mrs. Hay noted, "At DES I've developed a more individual philosophy of my own because of the school philosophy." The more global, collective philosophy of the school-as-a-whole often expanded or clarified individual beliefs.

Focusing on the common goal of multi-age grouping, unity of purpose was accomplished intentionally and with purpose. Mrs. Nen explained her observation,

So I think the hardest question for all those teachers who come in and say, 'how do you make this work?' We were able to pick the staff that had the philosophy. I think the staff support and everyone had the same philosophy.

The purposeful creation of interview questions that elicited shared beliefs, the analysis and application of instructional strategies that embodied these beliefs, and the ongoing accountability to these shared beliefs as programs and staff changes facilitated the continued unity of purpose.
Empowerment coupled with responsibility.

Empowerment coupled with responsibility allowed teachers to make important decisions at the school level so that the education of the student was improved (Levin, 1988). This decision-making process was learned both formally and informally and influenced classroom instruction. A novice teacher explained,

I think Accelerated Schools, especially with me as a learner and a teacher, it has helped me a lot. I've been given power to change things if I think they need to be changed in the school and I've been given power to just bring things up if I think that it is necessary. You know, not even to change it myself but to make an issue; have other people start thinking about it without having to go behind someone's back and saying this is how its going to be. As it goes back to the classroom, I ask them what should we do.

The shift to site-based decision-making transferred from the teacher to students as well. Mrs. Pao reflected,

I learned by modeling as well. I've been given the power; it makes you feel good and makes you appreciate a little more and it makes the students appreciate more. Because you have been involved in it yourself, you might pass it on a little easier. It might be easier to give them a little bit more power in the classroom instead of saying here is what we are going to learn. Because you have been given the power to investigate report cards or something like that, and implement it.

Building on strengths.

Referencing the utilization of all the people resources, building on strengths employed those things that people do well as the starting point for change, learning, or any endeavor in the school (Levin, 1988). One particular instructional strategy that focused on what people did well was that of cooperative learning. This strategy encouraged the construction of knowledge through small group interaction and cooperation. Students and teachers worked together for a common purpose for a variety of reasons; to increase motivation, improve social skills, or acquire a skill or concept (Johnson & Johnson, 1990).
The Model

"It is, as it were, the story of action within a theory of context, (Stenhouse in Goodson, 1990)

A grounded theory (Strauss & Corbin, 1990) of the development of context was discovered through conceptualization of student/student and student/teacher interactions and their linkages between the impact of multi-age grouping on instructional strategies, teachers' constructs and the organizational structure of Accelerated Schools. This interactive model, described as a "story of action within a theory of context" (Stenhouse in Godson, 1990) is shown in Figure Four. In this model the story of action is depicted through the relationship of interactions between and among students and teachers in a multi-age context and their subsequent impact on instructional strategies and teacher constructs. These impacting factors emerged in a developmental fashion as described through the categories of initiation, transition and operation. Initiation contained the features necessary for the action to begin transition, consisted of features that moved the action forward, and operation was the internalization of all the features resulting in actuation of the model. The theory of context presented through the Accelerated Schools process linked all concepts together to form a unique context - DES.
Figure 4: "A story of action within a theory of context." Stenhouse
The Story of Action

The story of action began with interactions between and among the significant characters (teachers and students). The features associated with these interactions included student-centered philosophy, flexibility and facilitation. For this action to unfold, the teacher first demonstrated a willingness (or belief) to focus on students as the center of the classroom, as opposed to content or teacher needs; initiation. This student-centered feature was the initiator that enabled interactions to occur among and between students and teachers in a manner that influenced both teaching and learning.

The second feature of this story of action, flexibility, actively allowed teachers and students to spontaneously modify their interactions as influenced by factors of status, teacher/learner roles, and developmental continuums. Flexibility was directly linked to student grouping patterns that were dynamic in both aspects of time and membership. The ability for students to continuously move between groups organized around interest, age, ability or cooperation enabled the amount and depth of interactions to increase and the action to progress, constituting the transition phase.

The final feature of this story of action, facilitation, described the instructional relationship of teacher to student. Through the linked factors of questioning and constructivist instruction, teachers guided student learning as opposed to directly leading it. It was at this point that the focus of interactions among and between students and teachers became automatic or operationalized and the model actuated.

All three features, student-centered philosophy, flexibility, and facilitation through their descriptions, comprised the story of action linked to instructional strategies and teachers' constructs that impacted multi-age grouping. These features were, in turn, influenced by the Accelerated Schools process; the theory of context.
The Theory of Context

The Accelerated Schools process included the principles of unity of purpose, empowerment coupled with responsibility, and building on strengths. These principles existed both in the theory itself and as well as in the model.

Unity of purpose entailed the cohesiveness of teachers' beliefs and the subsequent application to and impact on instruction and teachers' constructs. This cohesiveness transferred to instructional strategies and teacher constructs.

Empowerment coupled with responsibility impacted the merging of teachers' constructs and instruction to form DES's unique context by encouragement of the administration and teachers to take risks on the part of teachers and students, respectively. Through this risk-taking, teachers and students developed a sense of efficacy that included a self-confident responsibility for those actions.

The final principle of the Accelerated Schools theory as applied to the model was building on strengths. By capitalizing on the abilities of students, staff, and parents, the shifts necessary to create a novel context, DES, were encouraged. Students were viewed as capable, staff as shared decision makers, and parents as team members.

Hypotheses

A series of working hypotheses were inductively generated (Cronbach, 1975; Lincoln & Guba, 1985) from the study findings. The transferability of the working hypotheses are limited to a similar research context and conditions. Although the working hypotheses are tentative for the given research context and may differ in the same context over a period of time, their primary purpose was to provide insight into implications for further study.
Hypothesis One

*Multi-age grouping, when organized through a strong shared decision governance process, benefits students and encourages interactions among and between students and teachers.*

Changing the patterns of failure among groups of children may indicate a need to modify the social interaction systems at work within classrooms. The interactions among and between students and teachers in this study were many and varied. The interactions occurred as a result of multi-age, flexible grouping patterns. Additionally, these interactions impacted on the instructional strategies utilized by the teachers. Collectively, these factors influenced a positive academic shift for students. To bring at-risk students into the mainstream of academic success, then, interactive systems as defined through a multi-age context appear to be appropriate.

Hypothesis Two

*Multi-age grouping, when organized through a strong shared-decision governance process, strengthens or actuates changes in teachers’ constructs regarding teaching and learning.*

Meeting the needs of a diverse population required a flexible educational setting; one that recognized that all students can learn, were entitled to a quality education, and began instruction by building on the individualized experiential levels of students. To recognize these individual learning needs and structure the supportive instructional strategies to meet those needs, teachers possessed a belief system that supported the notion of developmentally appropriate practices. Through the interactions that occurred, as a result of the multi-age organization of classes at DES, teachers validated their existing beliefs or modified prior beliefs so that recognition of cognitive continuums was their foundation for teaching and learning.
Hypothesis Three

*Peer and teacher acceptance is facilitated through socially organized talk as demonstrated in a multi-age context.*

The importance of teacher and student acceptance of one another is supported in the literature as being critical to positive academic growth of at-risk students (Cazden, 1988). Within the categories of student-as-teacher, and teacher-as-learner, the data supported that multi-age grouping facilitated teacher and student acceptance through social interactions. Student/student interactions in a multi-age context included student acceptance of one another as demonstrated in student-as-collaborator and status categories. As a result of all interactions, students' perceptions of acceptance by the teacher were increased which in turn, improved learning of at-risk students.

Hypothesis Four

*Acknowledging that recognition of cognitive continuums of learning and its concomitant application to continuous student progress, multi-age grouping is a pivotal milestone along the continuum of optimal organization of schooling.*

Student progression along a continuum of learning was accomplished by recognizing the individual needs of students. Those needs were satisfied, in part, by grouping patterns and instructional strategies that were flexible, developmental, and integrated. The ultimate application of developmentally appropriate instruction that addressed individualized needs was a context that had no grade boundaries. Multi-age grouping, within the context of DES, allowed for the application of developmentally appropriate instruction and individualized instruction within the expanded grade boundaries of primary and intermediate classes. As a result of the validation and clarification of teachers' constructs as impacted by this multi-age context, multi-age grouping may serve as a point along the developmental continuum that ranges from single-age classrooms to non-graded schools, a non-graded school orientation representing the ultimate application of developmentally appropriate instruction for a diverse society.
Pedagogical Implications

Derived from this study were implications for education. These implications emerged directly from the questions targeted in this study and are related specifically to factors pertaining to the development of contexts that provide a quality education for a diverse society.

Teachers' beliefs, and the diversity of those beliefs, were a consideration in understanding the development of unique settings. Although the development of teacher beliefs have been promoted in the literature as influenced or developed by context (Good & Brophy, 1994), the nature of teacher beliefs in this study appeared also to influence the development of context itself. The combination of veteran and novice teachers may be the factor that enhanced this phenomena. Veteran teachers, experiencing this multi-age context were influenced by the interactions and concomitant instructional strategies. These experiences, within this context, served to influence their beliefs about teaching and learning. Novice teachers, on the other hand, entered this context with compatible beliefs and strategies that served, in turn, to refine and expand this multi-age context. The importance of personal beliefs and experiential make-up of the teachers themselves is a critical component to this and any educational model.

Demonstrated by the data, social interactions among and between students and teachers enhanced learning. The nature of these interactions were collaborative, reciprocated the teaching/learning process, and established supportive learning contexts through the student/teacher roles of status and affect. All of these interactions were critically enhanced through a multi-age context. By establishing an environment that allowed for these interactions, expanded curriculum boundaries, blurred age delineations, and facilitated the development of normal cognitive continuums by teachers knowledgeable of how children learn, students progressed to their ultimate learning
potential. A flexible learning environment was created that is capable of meeting the needs of a diverse society.

Educators should be aware of the value of multi-age classes in the development of powerful learning contexts. The flexibility of grouping patterns and impact of cross-age and peer interactions in this study demonstrated the relationship of implementation of instructional strategies to academic shifts. Subsequently, grouping students according to cognitive development continuums appeared to strengthen student learning contexts. This provided further support through the importance of the awareness of grouping patterns on the part of students. This student awareness suggested that they are flexible in their own learning and that this variety of options assisted with the learning process.

In promoting and influencing the development of a multi-age context, curriculum design that fosters this context must be utilized. A curriculum framework that supports developmentally appropriate practices, allows for teacher flexibility, and provides an individualized base from which to teach is a critical consideration. Finally, the opportunities for these variables to develop, grow, and refine must be provided within a structure that allows for collegiality, shared-decision making, self-evaluation, and accountability. The Accelerated Schools process is one such opportunity.

Through the study of interactions between and among students and teachers, the complex beliefs of the teachers and how these beliefs were interwoven with perceptions regarding student learning and the concomitant instructional strategies, and the type of context that supported this student learning also emerged. As these teacher beliefs impacted context, context as it related to interactions and instructional strategies, these interactions in turn impacted the context. A cycle of action begins: beliefs impacting context, context impacting interactions, interactions impacting teacher constructs. If a supportive, student centered context is to be influenced and promoted, educators must be aware of compatible, research based beliefs about students and learning, school and classroom settings that foster interactions, and interactive instructional strategies.
Directions for Further Study

Directions for further study point to four areas of research. They are, (1) the areas of specific variables of consideration when grouping for multi-age, (2) academic achievement as a result of specific instructional strategies, (3) the assessment of those academic gains that reflect multi-age grouping and individualized growth, and (4) delineation of beliefs, education, and utilization of instructional strategies needed by teachers to be successful in a multi-age setting.

There is at present no empirical basis on which to predict what proportion of older to younger children within a class are optimal nor the age ranges of those children. Comparative studies of classes with a two- versus a three-year age spread could identify the effects of age range on the amount, and content of cross-age interaction.

Process or holistic instructional strategies (writing process, literature based reading instruction, whole language) have been thematically utilized in classrooms across the country. Research is lacking, however, in both the application of these specific strategies and the assessment of the gains achieved as a result of these specific strategies within a multi-age context. This assessment is crucial in that data, norm, criterion, and alternative in nature, must be collected representing a continuous progress orientation as opposed to single age applications. Presently, the majority of the classroom data represents assessment of strategies as applied to single-age learning continuums and normed populations. Evaluation of learning that occurs from a combined teacher/student perspective (e.g., portfolio processes) as well as their own individual insights is needed.

Finally, those characteristics or beliefs needed by teachers to successfully implement a multi-age classroom should be researched. While the teachers studied in this context could be perceived as exceptional teachers, this should not be an argument to deter multi-age grouping. Studies that research the belief systems, educational
background, and instructional strategies utilized by teachers that facilitate movement of students along individualized learning continuums should be conducted.

Conclusion

Multi-age grouping, as defined through the above categories, serves as an alternative answer to the current myths of education as presented in the literature. Myths where the teacher is seen as the only transmitter of knowledge, the belief that students within one year will have similar learning needs and will therefore benefit from similar instruction, and that learning is an orderly, sequential, hierarchical process have been dispelled. Myths that perpetuate a year of schooling not as an educational process but a product with some standard upon which that product can be judged and rated have not demonstrated positive student affective and academic growth. (Anderson & Pavan, 1993; Cazden, 1988; Good & Brophy, 1994).

Breaking down these mythical barriers influences instructional strategies which in turn influence academic shifts. The result of interactions among and between students and teacher and their impact on instruction and teacher constructs can best be summarized by the teachers and students of DES. Mrs. Iam provides a summary of her experiences at DES and the educational benefits for children,

When I think back over the last three years and what's happened in this school I'm amazed. When we started we were a collection of teachers who hardly knew each other; a few people had worked with others in the group. But, for the most part, we came with different philosophies, different teaching styles, different backgrounds, and we came together not knowing exactly what we were getting ourselves into. The first meetings we had we tried to find a vision that was in common and we seemingly did. Though at that time, the idea of consensus and teacher-made decisions really hadn't sunk in. There were a few people who really couldn't buy into, or honestly inside themselves agree to, what the whole group had come up with. This caused some problems which ultimately ended with those people leaving or changing. Several left and several changed. I think the biggest difference in what has happened from the beginning to now is that in the beginning we were more concerned with how we were organized and what this restructuring was doing to us. Then over the last two years, I think I've seen a shift to where
now we're looking at what is happening to how this restructuring is affecting the children. How it's bringing them into the decision making processes. How it's giving them empowerment to be learners on their own. I think this is tremendous growth, particularly for young teachers to take on. To be secure in the feeling that what they are doing is affecting their students. The children show this independence and this philosophy that we embody; that they can do, that they can learn, that they know how to go about their learning. The confidence level of these at-risk students has risen so much.

Finally, two students, one primary and one intermediate, give poignant descriptions of the powerful impact of multi-age grouping on their educational experience,

Primary: I wrote a story about a spider named Anansi. I did it by believing in myself. I brainstormed. I wrote it down. I fixed it.

Intermediate: At DES we learn in many ways. We respect others in our class and in the school. We learn math, reading and other subjects. We are at different levels. We have different cultures and we have to respect those differences. We respect the rules and share. We love DES! The End.

Much rhetoric is being bantered about regarding preparation of our students for the twenty-first century, a century where the diversity of our population will expand, where employment opportunities will exist in many yet to be defined fields, where our economic and political boundaries will become global, and where, if we maintain our present educational course, literate and educated citizens will be an elite group. Being one of the greatest gifts provided by our democratic nation, public education must survive. In order to survive, it must meet the needs of a diverse student population, a population that will require an educational system that meets the students' educational needs rather than a predetermined niche in which the student population must fit. To eliminate this paradox, the system must be flexible and interactive in order to meet the needs of a diverse society. Multi-age grouping is one such answer.
Bibliography


Arnold, A. (1983). Where should we go with the three r's? Learning, 12(1), 32-34.


TO: Francine Mayfield
FROM: Dr. William Schulze, Director, Office of Research Administration
DATE: 8 March 1994
RE: Status of Human Subject Protocol entitled: "Multi-Age Grouping in an Accelerated School"

This memorandum is official notification that the protocol for the project reference above has been approved. This approval is for a one year duration. At the end of the year, you must notify this office if the project will be continued.

If you have any questions or require any assistance, please give us a call.

Comments:

The IRB is waiving the need for assent from children since the investigator holds the position that is conducive to this form of interaction with the children. Also there are no identifying factors involved.