DEVELOPMENT OF A COMMUNICATION TOOL TO SUPPORT
THE PRESCHOOL INTERIOR DESIGN PROCESS

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(Abstract)
This study was designed to investigate the need for a communication tool to support child development professionals, design professionals, and parents in the preschool design process. Guided by the theoretical perspectives of Gardner and Bronfenbrenner, this research examined the need for a support tool in the design process, the format and content of such a tool, and the evaluation of a tool developed using the data as an organizing structure.

The following research questions guided this study: (a) Is a tool or support document needed to help educate and support communication between child development professionals, parents, and design professionals in the early phases of designing a preschool facility?, (b) What are the format and content issues that need to be addressed and included in developing such a tool?, and (c) How would child development professionals, design professionals, and parents comment on the usefulness of an educational/communication tool?

A multi-method data collection procedure was used to gather the data for the study. A focus group was conducted to ascertain general information from child development professionals, design professionals, and parents about their opinions and perceptions of the design process as a result of their personal experiences. Following the focus group, 13 interviews were conducted with different individuals, but representative of the same three populations. Upon completion of the interviews, the data were used as an organizing structure for the writing of a communication tool to aid in the design process of preschool facilities. The tool was then sent to 26 individuals for feedback using a questionnaire requesting responses about the need, content, and format of the document.

The results of this study showed that a support tool that fostered greater communication between child development professionals, design professionals, and parents was needed. Responses to the focus group and interviews also indicated that the format of the tool should be
paper-based, or in book form, and that the themes identified in the responses should guide the content of the tool. Questionnaire responses confirm that the tool developed was an appropriate document that provided important information for the respondents.
For Emily…

Now and Forever
ACKNOWLEDGEMENTS

We undertake graduate programs for a variety of reasons, and choose the direction we pursue based on many factors in our lives. Sarah Ban Breathnach talks about "Facing Your Future by Excavating Your Past" in her book Something More. My journey as a graduate student has been intimately tied to the excavation of my past as I move forward to make a difference in the future. Many people have supported this endeavor, and I wish to both acknowledge and honor them for sharing this experience with me.

Dr. Andy Stremmel, my chairperson, supervisor, and supporter, was willing to take a risk on me when I realized that to design for children I needed to know more about children. He welcomed me into the program when I shifted from interior design to child development, and encouraged my research, supported my efforts, and advocated for me when I, as usual, pushed the edges of the envelope to challenge tradition. I appreciate his efforts as an advisor and a friend.

My committee members, Dr. Anna Marshall-Baker, Dr. Bonnie Billingsley, Dr. Vicki Fu, and Dr. Cosby Rogers were constant sources of support. Their questions, suggestions, and efforts to help me explore my topic more fully added depth to my study, and provided insights unique to this group. I truly believe these individuals formed the most supportive, engaged, and courageous committee I have ever known. I also thank Bob Rogers for stepping in at the last minute to become involved and add his professional input into the work. I want to extend a special thank-you to Dr. Anna Marshall-Baker who has stuck with me from the beginning of my graduate work, and has always been there for me whenever I needed advice, guidance, or just an understanding ear. She is my friend and my mentor, and I hope to someday make a difference in lives of others the way she has made a difference in mine.

To the 26 individuals who were willing to share their experiences and their time with me to make this research possible, I owe a tremendous debt of gratitude. Their openness and enthusiasm for this project not only made it possible, but also made it a success.

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I thank my Mom and Dad who have stood by me throughout this adventure, tirelessly encouraging and supporting me. They believe in me, and I hope to always live up to what they know I am capable of accomplishing. And finally, to all of my family and friends who have made my life richer and more wonderful day by day, I thank you for the fun times, the shoulders to cry on, and most of all, the love and friendship that I endlessly count on.
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Chapter 1
Introduction

Our physical surroundings, whether inside a man-made structure or outside in a natural setting, impact us in a variety of different ways. Since the early 1950’s, many studies have been conducted to evaluate the effect of the physical environment on the behavior, development, and physical reactions of individuals (Chein, 1954; Kaplan, 1995). Research is available that addresses the effect of interior space on various aspects of adult behavior and attitude (Kuller & Lindsten, 1992; Sommer, 1969), but only recently has this research begun to address the needs of children within interior spaces. Over the past three decades there has been a greater concentration of research on the effects of physical environment on the behavior and development of children. For example, a study conducted by Gary Moore (Moore, 1986) explored the effects of open plans, modified open plans, and closed plans in child care settings on children’s behavior. Taking a more detailed look at children’s interior environments, Sybil Kritchevsky and Elizabeth Prescott characterized the complexity of play units and the effect of the organization of the classroom on children’s behavior in their research (Kritchevsky & Prescott, 1977). In a more recent study, Petrakos and Howe found that spaces designed with specific themes may limit the children’s creativity within play scenarios (Petrakos & Howe, 1996).

To provide interior environments appropriate for children is to give them a physical context that supports their healthy development and behavior. Clear communication between child development professionals, parents, and design professionals is critical if spaces are to be designed to support children (Zeisel, 1993). The purpose of this study was to improve communications during the preschool design process by providing a tool for use by the three identified groups. This purpose was accomplished in two stages. The first stage determined the attitudes of design professionals, child development professionals, and parents about the overall need, topical issues, and format issues that should be considered when designing a communication tool to support the process of sharing information when designing preschool spaces. Focus groups and interviews were used to accomplish the first stage of the research. The second stage included writing the tool and gathering feedback from research participants about the appropriateness and potential use of the communication tool in the design and child development fields.
Statement of the Problem

Increasing numbers of children are being cared for outside of their homes, and are entering early educational settings as a viable alternative to more “traditional” child care approaches such as parental care in the home. According to the U. S. Department of Education, over 72% of children ages 3 to 5 are provided care by someone other than a family member, and 55% of those children are in a center-based program (U.S. Department of Education, 1996). Often the facilities these children attend are created in spaces not specifically designed for the purpose of preschool environments (e.g. church classroom space and unassigned spaces in elementary, middle, or high schools), and become “makeshift” facilities from their inception. In addition, approximately 75% of the existing school facilities were constructed prior to the early 1960’s (Dietsch, 1993), indicating that new facilities or complete renovations of existing buildings are required to accommodate the needs of the preschool and school-aged children. These changes are driven by the need for more and different types of spaces than are currently provided, changes and problems in the infrastructure of existing facilities, and more contemporary approaches to instruction that require support in the form of changes to the environment. With increasing numbers of children requiring child care and preschool services; growing needs of children, families, and teachers; and a greater recognition of the effects of the environment on children, a comprehensive approach to the design of childcare facilities including clear communication between the parties involved is critical to the success of any facility (Brockett, 1993).

Many studies have examined different aspects of preschool children in educational settings such as emotions in learning (e.g., Wieder & Greenspan, 1989), cultural effects on relationships within the classroom (e.g., Farver, Kim, & Lee, 1995), attachment to caregivers (e.g., Mardell, 1992), and to a lesser extent, the environment. Individuals working in learning environments often have much valuable information about the needs of children and adults in preschool settings, but are often not comfortable with their abilities to communicate information to a design professional (Comer, 1992).

Design professionals by training focus on the function and aesthetics of interior spaces. Spaces that support the function for which they are created, and provide comfortable, creative, pleasant surroundings are often considered “successful” designs by both designers and clients (Pile, 1988). Designing for children adds another dimension to this process, since it is important to understand how children use space, which can be vastly different from the ways adults interact with space. By understanding how children use their near environments, spaces can be created to support their healthy development and to encourage appropriate behaviors.
Because of the budgetary issues on the part of clients and design professionals, often minimal
time is allotted in the design fees for research into journals and scholarly works to support
design decisions. This forces design professionals to rely primarily on the programming
process (the information-gathering stage) to gather the majority of the details needed to design
their projects (Piotrowski, 1989), making client input of utmost importance in preschool design.

The combination of the groups of individuals previously identified (i.e. design
professionals, child development professionals, and families) can create a powerful team when
designing spaces for children because they possess much of the information needed to create
appropriate, interesting spaces; but communication is central to the success of any team.
Previously, I conducted a study (Beacham, 1996) to determine the spatial characteristics
identified by design and child development professionals to be included in a design guideline for
preschool spaces. I found that both design and child development professionals had similar
ideas about spatial characteristics that should be included in preschool settings, but often
differed in the degree to which they believed specific characteristics were important. As a
result, the study recommended the creation and use of tools to enhance communication
between individuals involved in the design process. To date, no viable tool is available to guide
both design professionals and individuals involved in preschools (including teachers,
administrators, parents, and children) in understanding the design process and obtaining
information critical for the design of developmentally appropriate spaces for children. This
research addressed this lack of support for the people involved in the design process.

Integrated Theoretical Framework

The theoretical framework that guided this research evolved from the work of Howard
Gardner and his Theory of Multiple Intelligences (Gardner, 1993b), and from Urie
Bronfenbrenner who developed a model of the Ecology of Human Development
(Bronfenbrenner, 1979). Gardner provided a clear theory that is based on the concept of eight
separate intelligences developing simultaneously, but at different rates within each individual.
The theory stresses the contextual importance of intelligences and the critical position of context
in both the definition and development of each individual intelligence. Using his theory as a
basis, I propose that the physical environment is one context of development that has a
significant effect on children and must be considered in the study of children as a whole.

Bronfenbrenner’s Model of the Ecology of Human Development (1979), which identifies
the environment as an important factor in any child’s developmental process, provides a
secondary guide for this research. He gives us a graphic model that explains the five different
levels of environmental forces that impact children’s development, and provides a context for that development. According to Bronfenbrenner, the microsystem is the level that most directly impacts the child, and is the level within which the physical environment falls. Therefore, we can conclude based on Bronfenbrenner’s work that physical surroundings have a major influence on the development of the child. Together, Gardner and Bronfenbrenner provide a developmental theory and a graphic model representing the various contexts within which children develop to guide the proposed research.

Overview of Study

This study addressed the design of preschool facilities supporting children from three through five years of age. I selected this group because of the growing numbers of children this age who are attending some type of daycare, preschool, or kindergarten for either half or whole day programs (U.S. Department of Education, 1996). These children are also mobile, active learners who are developmentally advanced enough to begin communicating and asserting some independence, and make their own decisions regarding the activities in which they choose to participate. Facilities accommodating these children need to be supportive of their development and behavior to give them the best possible experience. There is a current trend to include infants and toddlers in many centers that previously accommodated only preschool-aged children. This research does not limit the ages of children within the facility being designed, but recognizes that the majority of children in child care centers today still fall into the preschool age groups identified.

For this study, I conducted a focus group with design professionals, child development professionals, and parents from different geographic regions of the United States who were attending a week-long class on designing preschool environments. Because of their involvement in the class, each person in the focus group had an interest in the design process and were either involved in designing a child care facility or anticipated involvement in the process in the near future. Upon evaluation of the focus group results, it became clear that individual interviews were necessary to gather further information on the research topic.

Interviews were conducted with design professionals, child development professionals, and parents who had been involved in the design of children’s spaces in some manner. Upon completion of the interviews and evaluation of the data, a workbook was developed for use as a communication tool in the preschool design process. The data guided the topics included in the tool, and the workbook was sent out to the initial research participants and six additional professionals for feedback. An open-ended questionnaire was included in the packet, and the
participants responded to the given questions. Overall the respondents felt that this was a helpful tool that would be useful in the process of designing new preschool and child care facilities. This feedback was compiled and included as part of the findings.

**Operational Definitions**

**Communication tool** - any type of mechanism to facilitate verbal and/or written communications between individuals or groups.

**Planning stage** – the first phase of any design project when the client group begins to define parameters of the job, hire design professionals, and make preliminary schedule and budget decisions (Pile, 1988).

**Programming stage** - an early phase in the design process when the design professional collects information to guide the design and orders that information into a useable format for the project (Kriebel, Birdsong, & Sherman, 1991). For example, programming would include gathering information about the number of children to be served in a facility, the desirability of having a lounge for parents, and the necessity of providing a cooking facility within the center.

**Design process** - the process of designing a space from the identification of a need to the renovation of an existing space or design and construction of a new space, to the final acceptance of the project by the client and evaluation of the success of the project after the client has taken occupancy (Pile, 1988).

**Developmentally appropriate spaces** - interior and exterior spaces that support a child’s development and growth, according to their unique abilities, interests, needs, and developmental requirements (Bredekamp & Copple, 1997).

**Research Questions**

Three primary research questions guide this study:

1. Is a tool or support document needed to help educate and support communication between child development professionals, parents, and design professionals in the early phases of designing a preschool facility?
2. What are the format and content issues that need to be addressed and included in developing such a tool?
3. How would child development professionals, design professionals, and parents comment on the usefulness of an educational/communication tool?
Chapter 2
Review of Literature

The research reported in this document explored the intersections of the fields of interior design and child development. As a result, the literature spans both disciplines, as well as additional research applicable to this study. Within this review, I looked at not only research that has been conducted in each of these fields, but also at the gaps in this research. By identifying and bridging these gaps, I find my own opportunities to make a difference and become a voice for children.

Personal Narrative

The effect of the interior environment has been shown to be significant on the physical well being, emotional state, and mental engagement of individuals (Burgess & Fordyce, 1989). Environmental psychologists, design professionals, and professionals working with children typically agree that the environment produces different behaviors or supports various emotional states (Edwards, Gandini, & Forman, 1993). In my personal experience, though, little thought has been given to this fact when it comes to designing spaces for children.

Corporations are willing to invest money in studies that will help improve their bottom line profits by increasing productivity and decreasing environment-induced sick time. Working for a major communications corporation showed me that many companies undergo major interior renovations primarily to achieve more efficient use of space, to alleviate the need to lease additional space, to reduce the risk of law suits as a result of personal injury, or to create a specific image for the company. Rarely is the true motivation the well-being of the employees, yet often renovations are presented to the shareholders and employees in that light.

Insurance companies are willing to fund limited studies to review medical facilities and determine how the environment can support an individual’s recovery, not for altruistic reasons, but as a cost-cutting measure. Again, this is a reflection of the same attitudes present in many other major corporations. Children, on the other hand, have no vast reserves of research money to fund studies and often have no voice in determining the designs of environments that influence and enhance their behavior, advocate their learning, and support their development in a holistic and healthy manner.

When spaces that house and support children are designed, that the intent of all involved should be, and often is, to provide appropriate spaces for them. However, to achieve these appropriate spaces, a great deal of communication must occur between all parties involved. As a professional designer familiar with the process of design, and a researcher
studying the needs of both children and adults in preschool spaces, I see that a critical problem in achieving the goals is a lack of communication. Not a refusal to communicate, but communication in two different languages. Design professionals desire to create appropriate spaces. Child development professionals know how children use spaces. In providing a tool to help them talk the same language and collaborate on designing children's spaces in a more integrated manner, I believe the designs that will result will far surpass any design created with the conventional methods of information gathering currently used. The teachers, administrators, and parents will have more opportunities to share their ideas and needs and will be empowered to communicate vital information about the requirements of both children and adults in preschool facilities. As a result, we can begin to help children become more successful in their environments, have a greater appreciation for their surroundings, and ultimately support their development in a variety of ways.

**Theoretical Framework**

A theory, by definition, is a declaration regarding the relationships that exist among concepts or ideas (Touliatos & Compton, 1988). A theory has three basic functions: (a) to organize and integrate existing information, (b) to help researchers see relationships that are not readily visible from data, and (c) to serve as a guide to the researcher by helping to identify questions to be asked and types of data to be collected.

In child development research, developmental theories are more often used as frameworks for the study of children and their growth and development. These theories further define the general theory by: (a) describing changes to an individual over time in behavioral, psychological activities, (b) explaining the course of development and offering a set of general principles for changes taking place, (c) giving meaning and organization to facts, and finally (d) guiding further research (Miller, 1993).

Theoretical models, on the other hand, provide researchers with a more graphic representation of a framework, system, or structure of research. Usually a model is developed in one particular field and can be applied to other fields to guide research and thinking because it is more of an abstraction than a specific thought process (Miller, 1993). In this way, models typically represent something other than themselves. This research was guided by the developmental theory offered by Howard Gardner, the Theory of Multiple Intelligences, integrated with the theoretical model of human development presented by Bronfenbrenner.
Bronfenbrenner's Model of the Ecology of Human Development

Urie Bronfenbrenner, a noted scholar of human development, has provided us with much information on the development of children. His ecological approach recognizes the context as an important factor in development, and his model offers an opportunity to build context into the research we conduct with individuals (Bronfenbrenner, 1979). Context, as Bronfenbrenner defines it, extends beyond the immediate system of interpersonal interaction and includes systems exerting additional influences on individuals such as social services, workplaces of individuals with whom the developing person is associated, governmental policies, and cultural attitudes and ideologies (Bronfenbrenner, 1979). While some scholars believe that he was referring only to psychological space and relationships in his definition of context (McMillan, 1990), based on his own elaboration of the framework (Bronfenbrenner & Crouter, 1983), I interpret Bronfenbrenner's work to include the physical and geographic contexts as well.

The ecological approach embraces both biology and environment as important factors in child development, hence the contextual nature of the idea. While biology provides little in the way of "content", it predisposes an individual to search for opportunities to grow. The environment, on the other hand, provides more of the content that advances development (Miller, 1993). As a result of these interactions, an environmentally constructed understanding of development is formed. Children use their interactions with the physical and social environments to build and advance their learning and development.

As part of Bronfenbrenner's context for children's development, the physical environment such as their preschool spaces can have a significant effect on children's interactions, feelings of competency, and growth and development. Because Bronfenbrenner's contexts are not limited to children, we can believe that adults (i.e. the teachers and administrators sharing the spaces with children) are equally affected by the interior environment in their daily lives.

Bronfenbrenner provides us with a graphic representation of his ideas, a model, to guide this contextual research that is based on five "systems" or developmental settings that affect, and are affected by, the development of the individual (Bronfenbrenner, 1979). These systems include the microsystem, mesosystem, exosystem, macrosystem, and finally the chronosystem, each moving farther from the individual's immediate contact and sphere of influence.

The microsystem was the primary setting for this research since it includes the physical environmental settings that most directly affect the developing person. Bronfenbrenner describes the microsystem as "a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material
characteristics” (Bronfenbrenner, 1979, p. 22). Examples of the environments, both social and structural, identified in the microsystem are the family, school, church groups, neighborhoods, and other groups with which the person has direct contact and influence. The preschool environment, which can reasonably be included under Bronfenbrenner’s “school” category, provides one important structural microsystem setting for young children.

Along with identifying the systems forming the context of development, Bronfenbrenner also identified scientific paradigms to help researchers further investigate the impact of the environment on development (Bronfenbrenner, 1986), and categorized them with labels similar to those of his contextual “systems”. Within these paradigms he formulated three environmental systems that may exert external influences on the family, thereby influencing the individual development. These systems, which he has called “models” are the “mesosystem model”, the “exosystem model”, and the “chronosystem model” (Bronfenbrenner, 1986).

The “mesosystem model” looks at research design through a paradigm that the family is the primary, but not exclusive, context of development and that different settings interact to provide developmental opportunities. The “exosystem model” is based on the idea that development is affected by not only direct contact with particular settings, but also by indirect contact through the impact other settings have on individuals important to the developing person. For example, the parent’s workplace may have an effect on the parent, who in turn has an effect on the developing child. Finally, the “chronosystem model” uses the changes that occur over time within the environment as well as the individual to analyze the “dynamic relation between these two processes” (Bronfenbrenner, 1986, p. 724). For my study, the “mesosystem model” provided guidance because of the importance of the interactions between the child care facility and the family system. While the impact of the environment is realized over time, this research concentrated directly on the contexts (or preschools) with which the child and family interact at a particular, limited time. The family should feel welcomed and respected within a child care facility, both by the physical environment and the program, and using the “mesosystem model” helped to focus the research on the influence of the child care facility on family processes.

Bronfenbrenner has not provided us with a full-scale theory to use as a framework for research, but he has given us a valid, useful model and a way of thinking about the development of individuals within a context and throughout the lifespan. The ecological perspective model was an important feature for this research because the context of the physical environment as addressed by the microsystem is recognized as an important factor in children’s development. The model does not offer us a complete framework, however. Time is
one of the “systems” identified in his model, but within this time, Bronfenbrenner offers no real process by which development takes place. Howard Gardner’s Theory of Multiple Intelligences begins to fill that void by identifying a specific process of development.

Gardner’s Theory of Multiple Intelligences

The theory of Multiple Intelligences (MI) developed as an alternative to the widely accepted traditional view of intelligence which is based on two assumptions; (a) that human knowledge and thinking is unitary, and (b) that individuals can be described in relation to one singular, testable intelligence (Hine, 1996). Gardner believed, after years of empirical research involving children and brain-injured adults, that development of intelligence went far beyond the traditionally accepted view and encompassed a broader view of developmental abilities. In his work, Gardner identified seven intelligences which he defines and discusses at length in his books Frames of Mind (1983, 1993b) and Multiple Intelligences (1993a).

To understand Gardner’s work, we must first define “intelligence” as he has used it in his research and theory. The traditional definition of intelligence is often measured by the individual’s ability to answer items on a test of intelligence such as an IQ Test. Gardner takes a divergent view of intelligence and defines it as “the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community” (Gardner, 1993b, p. 61). In other words, Gardner sees intelligence as the ability to solve problems, to generate new problems to be solved, and to offer a service or product valued within the culture in which one resides (Hine, 1996).

Gardner postulates that each individual is born with basic core abilities in each of the identified intelligences. He also believes that each intelligence is equally valuable and that it is possible to improve our intelligence in any of the given areas (Hine, 1996). The genetic factors play an important part in the attainment of “mature” intelligences, but ultimately it is the interplay between the genetic factors and the environmental opportunities that support and foster development. Like Bronfenbrenner’s Ecology of Human Development, Gardner sees the interaction between the biological predisposition and the social and cultural environment as the interaction that creates each unique person. Much of what Gardner defines as an intelligence is culturally mediated in that it is valued by the culture with which the person interacts (Gardner, 1983). This cultural mediation emphasizes the contextual nature of his theory and is a key attribute in Bronfenbrenner’s model.

In his early works, Gardner (1983) identified seven intelligences based on specific criteria. These intelligences included; (a) logical-mathematical, (b) linguistic, (c) spatial, (d)
interpersonal, (e) intrapersonal, (f) musical, and (g) bodily-kinesthetic. After additional study and revision, he added an eighth intelligence, naturalist intelligence (Shores, 1995). An overview of these intelligences is provided below.

Logical-mathematical and linguistic intelligences are the two primary faculties recognized by intelligence tests today. Logical-mathematical intelligence manifests itself in the form of reasoning, scientific achievements, and mathematical skills. The ability to deal with abstractions, numerical symbology, and problem-solving are often found in individuals with well-developed logical-mathematical intelligence. Linguistic intelligence focuses on language and verbal skills. Gardner identifies poetry as the ultimate expression of linguistic intelligence. Because most of the assessments used in determining intelligence, not to mention school assessments, primarily use language, math, and reasoning as vehicles, Gardner postulates that many brilliant individuals with high intelligence levels in other areas are unfairly assessed as low achievers (Gardner, 1983). These intelligences, while primarily thought of as “mental”, can be affected by the physical environment. With exposure to spaces that are designed to provide problem-solving challenges, opportunities for simplicity and complexity within the same area, and beauty and richness, children can learn more complex logical-mathematical and language skills.

Musical intelligence obviously deals with the individual’s skill in musical performance and/or composition. We often think of musical ability as a talent rather than an intelligence, but when evaluated by Gardner’s criteria for intelligences, its inclusion is empirically warranted (Gardner, 1983). Musical intelligence can be destroyed as a result of trauma, it has an identifiable set of operations related to neural stimulation, and gravitates to a type of natural symbol system for expression, which are just three of Gardner’s criteria for an intelligence. Music can be expressed in a variety of ways, and providing spatial elements that support musical exploration in the preschool setting, designers support the development of this intelligence.

Spatial and bodily-kinesthetic intelligences are also included in Gardner’s list. Spatial intelligence manifests in visual problem-solving, forming and using mental maps, and proficiency in patterning and mental imagery. Bodily-kinesthetic intelligence is somewhat associated with spatial since this intelligence centers around coordination and the ability to use and control one’s body. Typically this control occurs within some type of physical space, so some knowledge of the surrounding space is necessary to allow for this movement. While these two intelligences can and do function separately, they may often be used together to
provide the individual with necessary information enabling them to move their body freely through space (Gardner, 1983).

Knowledge of self and knowledge/intuition of others are also intelligences. Gardner calls these intrapersonal intelligence and interpersonal intelligence respectively. Reflection, self-knowledge, and understanding of oneself are important characteristics of intrapersonal intelligence, while communication skills and understanding of others exemplify high levels of interpersonal intelligence (Gardner, 1983). Environments that provide opportunities for personal, private reflection as well as opportunities to interact with individuals and/or groups on a daily basis can provide for more mature development of these areas.

Finally, the eighth intelligence was added by Gardner in 1995, and is called the “naturalist” intelligence. He describes this as the “ability to recognize important distinctions in the natural world” (Shores, 1995), although he indicates that this ability is not limited to natural phenomena and can be applied to man-made objects. The works of Charles Darwin and E.O. Wilson led Gardner to explore this ability and evaluate it as an intelligence. Again, complexity in juxtaposition with simplicity within the preschool environment gives children a chance to practice seeing distinctions between elements. Time and space to reflect on these distinctions is also important to the development of this intelligence.

Gardner has also identified "trajectories" through which development of each intelligence moves (Gardner, 1983). These trajectories include "raw patterning ability", "symbol systems", "notational systems", and "vocational/avocational pursuits". The following example illustrates musical intelligence in relation to Bronfenbrenner's systems as well as Gardner's trajectories.

1. Microsystem - a child begins to "play" with musical instruments in the preschool classroom, discovering that a musical sound is made through manipulation
2. Mesosystem - the child then brings the new knowledge acquired in preschool into their home to demonstrate the new skill to the family
3. Exosystem - the school board creates an after-school program for young children to provide musical instruction in a variety of musical instruments - the child participates
4. Macrosystem - the child continues to play music, develops a proficiency, and because of cultural expectations, continues to acquire musical knowledge in the form of a college degree
5. Chronosystem - the adult reflects on their musical development throughout their lifetime
6. Trajectory 1 - Raw Patterning Ability - the child realizes that music is made by creating tonal differences
7. Trajectory 2 - Symbol System - the child begins to understand that music is represented by songs (simple symbols)

8. Trajectory 3 - Notational System - the child understands that the marks on a piece of paper represent notes which are related to the sounds produced by instruments (complex symbols)

9. Trajectory 4 - Vocational/Avocational Pursuits - through practice and the acquiring of additional knowledge, the child forms the ability to play music using the complex systems developed through the three prior trajectories

In defining intelligence in terms of separate abilities, we begin to recognize the importance of valuing the strengths of each child individually. Today, much attention is given in the school systems to “including” children defined as having “special needs”. Using the Theory of Multiple Intelligences, we ALL have strengths and special needs. Applying this theory within the classroom, teachers attempt to find the level of each child’s strengths and build on that foundation. This is no different for children with identified problems. All children have the right to be in a situation that supports their learning and development (Edwards et al., 1993). The theory of Multiple Intelligences supports this by recognizing that each child has competencies, and charging teachers to address each child’s needs individually. Teachers and administrators have a responsibility to identify and define these needs during the design process to allow for appropriate support within the space created. For this study based on MI, separate consideration of children with special needs was not necessary. Their needs are taken into account in light of their level of maturity in each intelligence, and supportive programs and spaces are created.

By offering his theory based on eight separate intelligences, Gardner gives us a different way of looking at our own definitions of intelligence, how we determine if children are “smart”, and what we value as a society. This theory, while still in need of further empirical validation, provides a guideline for research into the development of intelligence and the effect of various factors on that development. The theory stresses the contextual importance of intelligences and the critical position of context in both the definition and development of an intelligence. I propose that the physical environment as one context has a significant effect on children’s development, and that Bronfenbrenner’s model overlaid with Gardner’s theory provided an effective framework for my research study.
Dissertation Framework

Bronfenbrenner’s Model of the Ecology of Human Development and Gardner’s Theory of Multiple Intelligences have many common factors. They are both based on an interactionist approach, supporting the idea that both genetics and environment play a part in the development of each individual. They both embrace quantitative and qualitative development in children. Development is seen as a continuous process happening over time, but also includes the development of unique, distinct ways of thinking, feeling, and responding to the world in terms of an individual’s own personal experiences and contexts. While Bronfenbrenner and Gardner see differences in what develops, the manner in which development occurs is similar. For example, Bronfenbrenner sees development occurring in the areas of cognitive, social, and mental growth, although he offers no process by which this development occurs. Gardner sees development occurring in each of the eight identified intelligences and offers a process by which development occurs, but little in the way of a context of this development except to acknowledge the importance of cultural mediation in each intelligence. Both, however, believe that development of each area occurs independently, although the factors from one area may inform other areas, and their interaction forms the individual’s uniqueness. Interestingly, Gardner’s later works with Feldman and Csikszentmihalyi (Feldman, Csikszentmihalyi, & Gardner, 1994) seem to recognize the lack of context in the developmental theory and begin to incorporate person – domain – field relationship into their research. As a result, both Bronfenbrenner’s and Gardner’s works are seen as contextual and ecological, and recognize the importance of the interaction between the person, the environment, and the process in development.

Although these two works integrate with one another to form a framework for the research I conducted, they are clearly distinct. Bronfenbrenner provides us with a graphic model illustrating, in ecological terms, how both direct and indirect experiences impact the development of the individual. Gardner, on the other hand, postulates a theory about the development of the individual, centering on the specific areas within the person that develop. Gardner has offered no models or graphics associated with MI.

Each of Gardner’s intelligences has the potential to develop and affect each of the systems identified by Bronfenbrenner. In my interpretation, much of the impact of MI on the individual occurs in the microsystems of Bronfenbrenner’s model as the person grows, influencing their immediate environment and in turn, being influenced by it. The preschool environment becomes a primary part of this environment for young children, and it is important not only to support children, but also to support adult competencies in the design process to
obtain more appropriate information with which to make design decisions. MI concentrates on the individual development and identifies eight areas in which individuals mature. As a result of development within these areas and the interactions among the areas, the individual moves forward in growth and impacts other levels of life. These levels are identified by Bronfenbrenner as the different systems that impact an individual’s life. The combination of ideas and areas of concentration in the work of Bronfenbrenner and Gardner created a supportive framework for my research (see Figure 1).
Figure 1. Interface between Gardner’s Theory of Multiple Intelligences and Bronfenbrenner’s Model of the Ecology of Human Development.
Child Development and the Near Environment

Developmentally Appropriate Spaces

Bronfenbrenner’s Model of the Ecology of Human Development and Gardner’s Theory of Multiple Intelligences formed a substantial framework for this study. The context of the microsystem, however, must be further defined to provide an appropriate structure upon which to base the research. In creating programs for young children, a guideline based on developmentally appropriate practices is often used. Bredekamp and Copple (1997), with input from a host of child development professionals, have created a document outlining developmentally appropriate practices which is used conscientiously by many child development professionals when creating programs. The intention behind the creation of a formalized document addressing developmentally appropriate practices was to support the idea that “programs designed for young children be based on what is known about young children” (Bredekamp & Copple, 1997, p. 8).

When the idea of developmentally appropriate awareness is moved into the realm of the near environment, professionals designing spaces will become aware of the importance of the concept in their designs. In consequence, developmentally appropriate environments, coordinated with developmentally appropriate practices, will become evident in every part of a near environment created for children (Bredekamp & Copple, 1997). Contextual studies recognizing the diversity of children and their individual approaches to acquiring information about life and the world are not sufficient unless the context (i.e. physical environment, curriculum) recognizes the children’s abilities at their specific stage of development. Child development professionals must help to educate design professionals about children’s development early in the design process since an understanding of these stages will allow designers to provide spaces that are appropriate for supporting children’s individual and group development.

Developmentally appropriate preschool spaces include environments that are suitable for children of preschool age and developmental level. They are spaces that are safe for children still working on their gross motor coordination, spaces that provide for imaginary play as the children move into different thinking patterns, spaces that support private and alone time during the day, and spaces that are sufficiently complex to challenge, but simple enough to be understood by children. Appropriate spaces support the developmental level of each child in the intelligences Gardner has identified, and give children the opportunity to explore varied activities in each “intelligence area”, moving their development forward. Many different concepts are important in designing developmentally appropriate preschool spaces.
Considering and understanding the development of each child is a vehicle for creating the spaces that will encourage their healthy growth.

Children’s Development

Children move through many stages of growth during the preschool years. These stages are associated with a unique set of accomplishments and abilities, and in traditional developmental views, occur within the areas of physical, cognitive, and social/emotional development (Wood, 1994). Gardner, however, takes a different view of development while recognizing a sequence through which children move as they mature in each type of intelligence (Gardner, 1993b). Although the range of development in the intelligences may vary from the three-year olds to the five-year olds defined as “preschoolers”, development is typically on a continuum and should be supported within the near environment. Children with special challenges may have greater variance on this developmental continuum, but require the same types of support from the physical environment as children with lesser challenges.

Gardner identifies four “trajectories” through which an individual passes in the development of each intelligence (Gardner, 1993b). These trajectories encompass different activities and milestones depending upon the developing intelligence, and have unique timetables of development. While the development of one intelligence may support the development of another intelligence, each intelligence develops independently. Therefore, a high level of intelligence in one area does not necessarily indicate high levels of intelligence in any other predicted area (Gardner, 1993a).

The first trajectory of development identified by Gardner begins with “raw patterning ability” and is typically seen in newborns and infants through the first year of life. This trajectory is exemplified by basic explorations often evidenced in activities such as creating tonal differences with their voices, exploring spatial qualities of toys, and smiling/interacting with primary caregivers to create relationships (Gardner, 1993a). Each of the intelligences manifest this raw patterning ability in different ways, and may correlate to the more traditional developmental views of cognitive, physical, and social/emotional development.

The second trajectory Gardner offers is seen in children’s exploration, understanding, and use of a symbol system. During the toddler and preschool years of ages 2 – 5, children are beginning to grasp various symbol systems and develop them for use in each of the eight intelligences (Gardner, 1993b). While this symbol system is elementary, it provides a foundation for later development of more complex symbology. Examples of this system may include developing an understanding of music symbols through learning songs, greater
understanding of spatial elements through drawing, or bodily-kinesthetic understanding through movement, gestures, and dance. It is during this second trajectory that an “at promise” youth may be exposed to a specific aspect of this system that intrigues or “calls” them to their particular gift. Revelation of particular gifts does not always occur during this stage, but exposing children to a variety of stimuli provides the opportunity for them to identify their greatest interests at an early age (Gardner, 1993b). Greater exposure also helps adults to identify children who are at risk in particular intelligences and give them encouragement and support to aid their progress (Gardner, 1993b). Preschool environments that are designed to give children in this stage exploratory and hands-on experiences allow them to develop their intelligences in a natural, and appropriate manner.

The next step in the progression of a child’s symbol system is an understanding of a notational system, the third trajectory Gardner identifies. A notational system is a more complex symbol system that is generally developed during the beginning of the formal educational process. This system may be illustrated by more formalized math problems, reading and sentence development, and musical notation (Gardner, 1993b). In the formalized school setting, assessments of these notational systems becomes more pronounced, and according to Gardner, are often inappropriate. For example, assessing a spatial intelligence through the use of words and language (i.e. a written “test”), is ultimately assessing language skills, not spatial knowledge.

Finally, the trajectory moves into adolescence and adulthood with an expression of the more complex notational system within the context of vocational and avocational pursuits (Gardner, 1993b). Using the intelligences recognized as interesting, enjoyable, or productive, individuals move their abilities and intelligences into culturally mediated settings and begin contributing to the well-being of themselves, their families, and the culture by the application of their specific strengths. Individuals will, hopefully, continue to learn and develop, sharing the understanding of their specific intelligences with future generations.

Gardner sees the development of each intelligence within each trajectory as contextual, and although he recognizes the contribution of genetics to the baseline core abilities of each individual, exposure and opportunity within a cultural setting are the vehicles for moving the intelligence forward (Gardner, 1993a). The physical context of development in preschool-aged children is often a care facility or daycare outside the home. The effects of particular elements of these facilities on children have been studied and show a variety of results in relation to children’s behavior and development.
Spatial Effects on Children

The effects of the near environment on children are varied and manifest in different settings and in different ways within each child. Because one of the primary methods children learn is their play, providing appropriate areas to foster play become paramount to children’s learning. Other learning environments are also important, and cultural recognition of the importance of the learning environment is seen in schools such as the Reggio Emilia schools in Italy (Edwards et al., 1993), the Waldorf Schools in Germany (Steiner, 1996), and the overall design sense recognized in the Scandinavian countries (Zahle, 1961). The different effects spaces have on children have also been researched in other contexts. Each of these areas will be addressed in this section.

Play. Play is recognized as an important factor in the development of all children (Rogers & Sawyers, 1988). As such, types of play and spatial attributes that support play should be considered as primary design criteria when creating new spaces for children. It is possible for environments to encourage disruptive play or constructive play. For this reason and others, it is important to understand the different types of play preschoolers may engage in to create spaces appropriate for their level of development and play needs.

Howard Gardner does not specifically address play in his MI theory, although it is reasonable to suggest that each of the intelligences identified are furthered in some way by children’s play. Although Gardner identified limitations of Jean Piaget’s work (Gardner, 1993a), Piaget provided a framework for studying play based on children’s developmental levels. Piaget identified stages of play that directly correspond with his stages of cognitive development: practice play, symbolic play, and games with rules (Elkind, 1981; Piaget, 1962).

Preschool children primarily engage in the symbolic stage of play, exemplified by pretend or fantasy play. Younger preschoolers often engage in pretend or symbolic play in which they use objects or symbols to represent reality and create imaginary situations, interacting with these objects (Rogers & Sawyers, 1988). Providing props and costumes for dramatic play that are available at any time becomes an important way of supporting this symbolic play. Creating settings that suggest opportunities for imaginary situations, and the proximity of manipulatives to the props will also support this symbolic play. Providing manipulatives and objects close to dramatic play areas for younger children will help to give them concrete items to initiate more dramatic play conditions (Hughes, 1991).

Older preschoolers are more interested in interacting with others and engaging in more cooperative social play, often still using symbolic play to create more realistic settings for their fantasies. They have greater muscular control and often feel great confidence in their abilities,
giving them greater courage to take more physical and cognitive risks (Hughes, 1991). Providing larger spaces and continued support for dress-up and dramatic play are critical. Both gross motor and fine motor activities will help them develop higher levels of skills in a variety of play arenas. Much of their play will involve other children, and props and costumes that aid them in recreating family roles, character roles, and functional roles are significant in encouraging and sustaining their play (Garvy, 1977). While children in this stage will often make up “games” to play with their peers, they have rarely reached the developmental level to use games with concrete rules consistently. Having these types of games available may support the developmental transition, but children should be given the option to use the games in ways that are developmentally appropriate for their personal level.

Some cultures have recognized the importance of appropriate learning environments for children and incorporate this understanding into the structures designed for preschools. One excellent example of this cultural awareness is seen in the preschools of Reggio Emilia.

**Reggio Emilia schools.** Child-centered approaches to care and education with a recognition of the importance of the environment in children’s development have taken many different forms over the past century. An example of this approach is the preschool system of Reggio Emilia. While there is little empirical research available to support the effectiveness of the Reggio approach, over the past 50 years, the Commune of Reggio Emilia in Italy developed a daycare/preschool system that has recently been recognized by child development professionals as one of the best educational systems in the world (Edwards et al., 1993). This system, based on the philosophy of partnership between parents, students, teachers, educational advisors, and the community, emphasizes the physical environment and requires “thoughtfully designed physical spaces” to help children develop (Gandini, 1984). The centers of Reggio Emilia are considered living organisms and are constantly evolving physically as their programs evolve, requiring a great deal of flexibility in the physical spaces provided (Gandini, 1984).

The spaces of these schools and centers are personalized for the children, reflecting their possessions, their activities, and their cultural environment (Gandini, 1984). The space reflects the culture within which these children mature, and reinforces the ideas, values, and attitudes of their culture. Reggio Emilia partners believe that space is a powerful factor in organization, encouraging good relations between people, providing choices and activities, and giving tremendous opportunities for social, affective, and cognitive learning. Art, aesthetics, and play become integral and important aspects of the school, reinforcing the many ways in which the children within this environment are encouraged to learn (Firlik, 1996). Lella Gandini (1984)
expresses this focus on the environment by saying “The schools are full of light, variety, and a certain kind of joy. In addition, however, teachers, parents, and children working and playing together have created a very particular space: a space which reflects their personal lives, the history of the school, and the immediate culture and geography of their lives” (Gandini, 1984, p.20).

While the schools of Reggio Emilia could not simply be moved to the United States, the philosophies could be easily applied to existing institutions (Firlik, 1996). The values of partnership within the community, freedom of learning styles for the children, the inclusion of individual cultural values in the program, and the recognition of the importance of the physical environment in supporting these learning experiences are philosophies that translate into any culture. We see many of the same philosophies reflected in the German Waldorf Schools.

**Waldorf schools.** Another alternative educational approach that considers the environment critical in the educational process of children is the Waldorf School, begun by the Austrian philosopher Rudolf Steiner. The Waldorf approach was begun in 1919 in Stuttgart, Germany and has grown to over 500 schools in 32 countries, 91 of which are located in North America (Dorwart, S. & Long, P., 1998). This method is based on the goal of educating children in a holistic environment by emphasizing a spiritually-based approach to education based on the “heart, head and hands” (Lawrence, personal communication, 1995).

Steiner identified the threefold nature of the child as will - love - intelligence, and based the Waldorf method of education on these stages of development. These stages correspond with physical stages of the child and appear in approximately 7-year increments. The preschool ages fall within the “will” stage which is identified as the time of developing creativity through movement and physical activity. According to this philosophy, the more opportunities children are given for expression through movement within this stage, the more prone they are to exhibit greater intelligence and creative thinking in later years (Steiner, 1996).

Based on this belief, Steiner felt that the physical environment was an important tool in supporting this development. Spaces were provided for much large muscle movement as well as climbing, crawling, and other activities encouraging dexterity and balance. These spaces also had areas for imaginative and creative play including painting, drawing, acting, and fantasy. To help the children understand their connection to the earth, they are surrounded with natural materials whenever possible. Wood is used for construction, interior elements, and toys; cotton and wool used for finishes, accessories, and toys. There is very little emphasis on detail within the spaces or in the toys provided, encouraging children to use their powers of imagination to create their play spaces. Steiner developed a science of color based on the spiritual aspects of
development recognized by the Waldorf approach, and spaces for younger children are done in earth tones with corals, beiges, and roses predominating to bring comfort and warmth to the spaces (Lawrence, personal communication, 1995).

Overall, the Waldorf school appears to represent an even greater deviation from the traditional schools recognized today, yet the basic theories of development follow the ideas of many well-renowned theorists currently studied. The school creates a structured freedom within which the children develop by being encouraged to participate in activities for which they are developmentally ready and work with the things they enjoy (Steiner, 1996). As a result, the children are eager to explore their own personal interests and learn the lessons appropriate to their level of involvement. The physical environment plays an integral part in the support of this by providing a backdrop for this development to continue. Some cultures recognize the importance of aesthetics and environment and strive to exemplify this philosophy in every aspect of life. This belief is readily seen in all of the Scandinavian countries.

**Scandinavian design.** The past century has seen a growing commitment to design in the Scandinavian countries. Many world-renowned designers from these countries have emerged with classic designs such as Hans Wegner, Alvar Aalto, and Walter Gropius (Zahle, 1961). The attention to aesthetics encompasses designs of furniture, homes, jewelry, accessories, toys, and many other items.

Scandinavians are also committed to their children, and strive to create a child-friendly society, recognizing that this is only possible when a “parent-friendly” society has been established. To this end, there is great emphasis on supporting children in their early years by providing exceptional child care. Children from 0 – 14 are included in the child care system, and care is mandated by the government for any child in need. Denmark has the highest coverage of public childcare service in the western world (Danish Childcare Website, 1998).

The design appreciation Scandinavians exemplify carries over to the children, and the spaces and toys they are exposed to from birth are of exceptional design and quality. Natural materials are used frequently to foster an appreciation of humans’ connection to the earth. Embellishments are added only as a support to the design of an item, not to frivolously “decorate” a piece (Zahle, 1961). Scandinavia does not present a unified preschool program such as Reggio Emilia, but does offer the world a way of looking at children’s programs in light of aesthetic appreciation and recognition.

**Spatial research.** Spatial research for children’s environments has gained recognition in the past few decades. Studies have been conducted in a variety of settings using numerous different methodologies. In addition to the research previously cited in this proposal, additional
studies are available to guide our understanding about how children use space and how different aspects of the interior environment can influence them.

Scale of the play space can have a significant effect on the quality of children’s play. Studies have shown that children tend to seek out smaller scaled spaces and create complex fantasy scenes within them (Tegano, Moran III, DeLong, Brickey, & Ramassini, 1996). Tegano also found that by altering the perceived scale of space, children’s attention spans during more complex situations increase significantly. This allows them to engage more fully in learning from the scenarios they create. Field (1980) conducted earlier research that determined not only the desirability of smaller spaces, but also the benefits of a low teacher/child ratio to facilitate greater peer interactions and fantasy play. Using Parten’s classification of play, she determined that more “optimal” play behaviors occurred in a classroom with low partitions creating smaller play spaces and a teacher/child ratio of 1:12 (Field, 1980).

Gary Moore has also looked at scale, but in a broader sense (Moore, 1996). Some of his studies have centered around the scale of entire centers, and he has found that smaller scaled centers foster more social interactions and feelings of security in the children. To this end, he recommends and advocates for larger centers to create decentralized facilities, reminiscent of villages with collections of smaller buildings as opposed to one large structure (Moore, 1996).

Access to natural lighting also has an effect, not only on the behaviors, but also on the physiology of children in classrooms (Kuller & Lindsten, 1992). Research in lighting often reaches a variety of conclusions, but overall, it is accepted that using natural light through windows, skylights, and doors is preferable and has a positive effect on both children and adults in child care facilities.

Play in the preschool environment has been studied in a variety of frameworks. Theodora Polito conducted an ethnographic study of work and play areas within classrooms (Polito, 1994), and found that it is important to provide context for the interactions between work and play to support children’s involvement in activities. In other words, if areas are not provided for open-ended exploration of materials and ideas, and space is not made available for ongoing projects, there is a lack of opportunity for spontaneous activities, ultimately hindering learning (Polito, 1994). Kounin and Sherman (1979) reinforce this idea in their summary of classroom research. They found that given a setting that provided a variety of activities, and freedom for the children to explore, the students spent almost 95% of their time engaged in meaningful activities.
Design of dramatic play centers has also been shown to influence the type of play that occurs. In their recent study, Petrakos and Howe (1996) found that spaces (or centers) designed with specific themes may limit the children’s extension of play beyond that particular theme. They also found that when centers were designed to encourage group interactions, children responded with group play, and centers designed for solitary play did, in fact, elicit solitary play from the children (Petrakos & Howe, 1996). While this correlation may seem logical, no research had been conducted to determine the effect of the design of dramatic play areas on the actual play of children.

Elizabeth Prescott and Sybil Kritchevsky have characterized the complexity of play units and the organization of the classroom on children’s behavior (Kritchevsky & Prescott, 1977). They categorize the complexity of play units into three levels; simple, complex, and super. Simple units have only one obvious role and do not encourage a child to be creative or to examine other uses. Complex units have subparts allowing a child to improvise or extend play somewhat, but with limited options. Finally, super units have three or more play components, and encourage multiple uses and involved exploration and extension of play. These units, some of which can be designed into children’s play spaces, have a significant effect on the quality of play in which children engage. Spatial organization is also a major influence on children’s play and behavior. When spaces are created with clear pathways leading to interesting activities, children are less likely to engage in inappropriate behaviors such as wandering, aggression, or disruption of other children (Kritchevsky & Prescott, 1977).

Prescott furthers the idea of meaningful decisions about preschool spaces in her article on the physical environment as a regulator of children’s experiences (Prescott, 1994). Here she describes a variety of dimensions to be considered when creating children’s environments including elements like hardness/softness, intrusion/seclusion, and open/closed. She also identifies specific problems such as children not becoming involved in classroom activities, and suggests environmental modifications to alleviate the problem (Prescott, 1994).

To date, there are no comprehensive guides for designing new preschool spaces, but evaluation tools are available to assess current facilities. While all of these rating tools do not concentrate exclusively on physical facilities, they do provide a method of conducting preliminary reviews on the appropriateness of spatial arrangements. The Early Childhood Environment Rating Scale (Harms & Clifford, 1980), is probably one of the best known rating scales for preschools. Harms’ scale does have sections relating to the physical environment, but is probably most widely used for evaluating program quality. Gary Moore has provided early childhood facilities with another rating scale that does deal almost exclusively with children’s
physical environments (Moore, 1994). There are questions for teachers to help them identify teaching styles, but the primary focus of the document is on the physical environment. While this comprehensive document can lend support to teachers and administrators committed to the physical surroundings, it is a complex and time-consuming scale to complete with little support for the users in the form of suggestions for spatial modifications based on the results of the exercises. This rating scale is a good tool to help committed child care providers identify problems, but it appears that they will most likely still need professional design help to rectify problems identified.

This research study supports the idea that the interior environment has a significant effect on children and their teachers, and should be high on the list of priorities of any child-centered care facility. It is usually necessary to involve a professional designer to obtain an environment that meets the client’s specific requirements and is creative and functional. An understanding of the interior design process is meaningful to all parties involved when beginning to plan children’s spaces.

**Interior Design**

**Design Process**

Much has been written on the process of design in a variety of contexts. Design thinking spans areas including interior design, architectural design, engineering design, environmental and urban design, instructional design, and a multitude of other domains (Cross, 1984; Miller, 1995; Schön, 1983; Shambaugh & Magliaro, 1997). For the purposes of this research, I will focus on the design processes primarily used by interior design and architectural professionals.

Some researchers see design as a concrete thought process including ideas such as problem formulation, analysis, and synthesis of ideas into a concrete product (Jansson, Condoor, & Brock, 1992). Others take a more philosophical viewpoint of design (Coyne, 1991), and see designers divided into two factions based on their approach to design. The first position states that designers are objective experts and can remove themselves from the contexts with which they are working to make decisions about form and structure based solely on the given information. The second position states that the designer is more of an artist, and that the spatial designs are more self-expression than objective forms (Coyne, 1991). At times designers use both of these approaches, but my feeling is that a balance between the two must be achieved for designs to be both creative and successful. This balance can be achieved with an approach that leads the design professional through steps to communicate with the client, gather important information critical to the design success of the project, and coordinate with
other professionals involved in the completion of the project. The approach outlined below is one way of accomplishing the communication that leads to creativity and success of design projects, and can be successfully used in most types of interior design including the design of preschool spaces.

The process of designing interiors can be approached as a distinct procedure used by a design professional in to create and implement a design project. This procedure is defined in different ways depending upon the professional and the type of project, but there are eight fairly standard steps used to approach a design problem (Pile, 1988). These steps include (a) planning, (b) programming, (c) space evaluation, (d) schematic or preliminary design, (e) design development, (f) contract documentation, (g) contract administration, and (h) post-occupancy evaluation. Although these steps appear to indicate a linear progression through the process, in actuality many cycles of the process are conducted throughout the project. Each step includes specific activities and products, and is an integral piece in the overall design of any project (Pile, 1988). Because this research focuses on education of the clients and design professionals to encourage better information-gathering from individuals and professionals involved with preschools, I will concentrate on the planning and programming phases of design (Beakley & Chilton, 1974).

**Planning**

The planning phase of the design process is the step in which the client defines the goals of the project and the scope of the work. This is also know as the “identification of the problem” step (Beakley, et. al. 1974). Many issues such as budget, schedule, and amount of work expected are discussed and preliminary decisions made by the client group during this phase. Little has been written about this early design phase since most of the tasks being performed center around client decision-making. Because many child development professionals have not been involved in the design process, support of some type is needed to help the client understand what needs to happen in this phase and the critical nature of their initial decisions.

Unfortunately, the design professional is often not brought in until late in this stage, simply because the client is addressing issues like preliminary budget, type of work expected, reasons for the work, and financing. While the client may see the design professional as unnecessary in much of this step, often there is valuable information to be contributed in this introductory stage. In deciding to hire a design professional, the client must make specific decisions to be communicated to the designer. Initially the client must define their expectations of the design professionals and what services they want for their specific project. When these
decisions are made and communicated to the design professional, they become the framework for communications between designer and client throughout the design process (Pile, 1988).

Learning how to communicate with design professionals is also an important step in this process. The research study reported here specifically addresses this issue, and provides a document to aid child care professionals in making planning decisions that will help them more easily move into the early parts of the next phase, programming.

Programming

The programming phase of any design project is one of the most important phases of the entire job. While some design professionals have attempted to separate this activity from the design process, in reality it is an integral part, providing the foundation for the design itself. Different approaches to programming have been offered by professionals such as Pena (1987) and White (1972). All methods of programming, however, are fundamentally based on communication between the design professional, the client, and other professionals (i.e. building inspectors, licensing agents, etc.) contributing information about the needs and requirements of the space to be constructed. Much has been written about programming in the design fields, but there has been little standardization of information and no commonly accepted definition in terms of interior design (Kriebel et al., 1991). After reviewing the literature available on this phase of the design process, Kriebel and her associates have proposed a definition that addresses the spirit of programming in relation to the interior design field. For the purposes of this paper, the term programming will be operationalized as “the process of collecting information relevant to a design situation and ordering that information into a usable form setting the parameters for the design” (Kriebel et al., 1991, p. 32).

Researchers often identify different phases of programming (Pena, 1987; Preiser, 1985; White, 1972), but many of the approaches are prescriptive, complicated, and restrict the use of programming information as a framework (Kriebel et al., 1991). Kriebel has identified three phases of programming that help to clarify the process but do not restrict the designer’s flexibility. The familiarization phase is the first aspect of programming and includes background research, educating the client about the process, educating the designer in the client’s language, generally defining the project, and organizing the programming effort. Because of the need for education of both the client group and the design team through communication, my research study has concentrated on the planning phase and familiarization phase of the programming process. The second phase is the compilation phase where the designer gathers information about contextual issues, physical features, aesthetic requirements,
behavioral requirements such as security and flexibility, and financial or budgetary issues. The final phase, or consolidation phase, is the time for synthesis and integration of all programming data collected. The designer interprets the data, communicates her understanding of the project to the client, and negotiates an agreement concerning the expectations and outcome of the design process (Kriebel et al., 1991).

Programming as information-gathering has developed as the profession has matured. Through the years it became clear to design professionals that clients often used different terminology, and an understanding of their language was imperative to meeting their needs. Designers also realized that their interpretations of a client’s needs were not always valid, so the advent of formalized programming was seen (Kriebel et al., 1991). Programming also offers the designer the ability to gather information to determine the balance between the human needs as identified and requirements of technology, safety, engineering, and other external influences (Kriebel et al., 1991). My research supports this ability. Gathering more in-depth information about the human needs of children and adults in preschool spaces will allow design professionals to design more successfully for these groups, and working in collaboration with all of the groups involved assures a greater volume of input made accessible to the designer.

Collaboration in the Design Process

Parental involvement in design. Security is an important issue for children of preschool age. To alleviate fear, separation anxiety, stress, and apprehension children may experience in new settings, a sense of safety and security is important, and the space can contribute to creating this atmosphere for children. Research documents the importance of safety and security in children’s ability to feel comfort (physical and emotional), to learn, and to engage in appropriate behaviors (Weinstein, 1987). For many children, a comfortable, softer, “homelike” atmosphere created within the classroom will encourage this safety and security. Trends today are moving toward incorporating more homelike qualities into the classroom to accomplish these goals.

Studies have been conducted to determine the elements important in a homelike environment for children, and have determined that seven factors significantly contribute to this image. These include territoriality, environmental manipulation, privacy, nurturance, identity, stimulation, and sociability (Miller, 1986). Creating spaces that support a child’s development and feelings of security in a preschool might include providing children with personal areas, places where they have some control over elements within the environment, space to be alone as well as together in groups, areas that make children feel safe yet challenged, and
classrooms and centers that have features identifying them as different. These characteristics may be expressed in a variety of ways, and designers should consider these needs when creating classroom spaces.

While research has identified many of the characteristics important in creating a comfortable atmosphere, regional and cultural differences may influence how these characteristics are interpreted. To gather information about specific homelike qualities, querying parents and families as to the attributes present in their own homes is an important activity. Their input into the design process not only deepens the designer’s understanding of their identified needs, but can also give richer information with which to make decisions about the character of the space. This input can generate additional programming ideas that may significantly contribute to the children’s security and comfort level within the classroom (Sanoff & Sanoff, 1987). Familiarity with objects and “ambiance” may reduce stress and allow the children to more comfortably separate from their families for periods of time. Including objects that are used in the homes also allows the children to become more adept at using them appropriately and teaching others about their particular culture (Edwards et al., 1993). Parents have valuable information about how the center supports both themselves and their children as they interact with the spaces. Including parents and families in the design process can be beneficial to the overall process. Parents can help identify patterns or problems in bringing children into the center, needs for social or discussion areas, space within the classroom to allow them to comfortably interact with their child, areas outside the classroom that allow them visual access to the activities within the class, and other needs and desires. Participatory processes within the design and programming process have been encouraged within the design fields to ensure more complete information with which to design (Moore, 1993; Sanoff & Sanoff, 1987).

By encouraging parents and other family members to contribute their thoughts and needs regarding a preschool facility, providing time to think, and an easy way to contribute their ideas, everyone benefits from additional design considerations. Including parents’ input into the design also gives parents a sense of ownership of the space and may encourage them to participate in other areas of their child’s preschool experiences.

**Children’s involvement in design.** Recognizing children as competent individuals acknowledges that they have valuable information to be shared in a variety of situations. This is especially true when designing spaces to support their development. Children are natural creators of spaces, as exemplified in much of their fantasy play. As such, it is important to obtain their input into the design elements for the spaces they will primarily occupy. While I believe children’s involvement to be important, as identified in the introduction, this research
project has focused on adult input only. Since the original focus of the research was to create a computer-based tool to support individuals involved in the design process, my intention was to include only adults in the first tool, then expand the tool in future projects to include graphic interfaces for children. The research data redirected the format of the tool to a paper-based tool, but the intention remained comparable: the initial tool was created for adults with some opportunities for children's involvement in the activities. Future iterations of the tool should be expanded to seek children's input to a greater degree.

When soliciting contributions from children in the design of preschool spaces, or any space where they will interact with the environment, the involvement must be meaningful and should be solicited in developmentally appropriate ways (Hart, 1987). The experience of involvement will support children's feelings of competency, increase their "ownership" of the space, and may also help them scaffold to understanding of organizational, spatial, and group processes.

In addition to helping children develop through the use of the design process, it is possible to ascertain many new ideas and thoughts about space from children. They are the users and are generally willing to share their ideas about spaces, design elements, and details when approached in a way that tells them their ideas are valued. To create such approaches, design professionals must team with parents, teachers, and others involved in the child care setting. "Only when young ones see that they can have an effect on their surroundings will they cultivate the positive feelings essential to mastering the world around them." (Torrice & Logrippo, 1989, p. 5).

Teacher involvement in design. Consideration of the needs of preschool teachers in the design process is also a critical component. While the numbers of children accommodated by the spaces far surpasses teacher populations, teachers have the unique position of influencing each child in some way. Teachers join children as primary users of the space, and programming must consider the needs of all users to ensure a successful design (Sanoff & Sanoff, 1987). Maintaining and/or increasing teacher satisfaction is one highly effective method of reducing turnover in centers. Kontos and Stremmel (1988) found that although caregivers experienced low salaries, minimal benefits, and long hours, they enjoyed their jobs and related this attitude to the "general context of the setting", presumably including both the social and physical setting. Securing teachers' input into the design process not only ensures that their needs are made known to the design professional, but their participation also gives them a greater sense of ownership in the design itself, often leading to greater satisfaction with the spaces.
The act of planning new centers or renovations to existing centers can be a time-consuming and complex activity. Understanding the process and the importance of the steps within the procedure will help teachers, parents, administrators, and others have a greater comfort level with the process and to provide the information critical to a successful design.

**Summary**

Research about child development, interior design, environmental psychology, and preschools is available and often prolific, as seen in this review of literature. What is not readily available, however, is a method of bringing all of these subjects together in an easy to understand format to educate both child care providers and design professionals about critical issues in preschool design.

The purpose of this study was to support the appropriate design of preschool spaces through better communications by creating an educational/communication tool to help child development professionals and parents understand the design process and the communication necessary with design professionals. The tool created can be used in the planning and programming phases of the design process to encourage collaborative efforts in the creation of new or renovated preschool environments. As shown in the research and supported by the theory and model chosen to guide the study, the physical environment can have a significant impact on children’s development and behavior, as well as satisfaction levels of adults sharing these spaces. By designing preschool spaces for children based on their needs and their levels of development over the eight identified intelligences, we provide greater support for their healthy growth and development. We also support the adults by providing for their needs and creating a more pleasant work environment that may encourage greater job satisfaction, less turnover, and more energy to devote to the children in their care.

Previous studies indicate that there is a commonality of purpose between design and child development professionals in providing spaces for children, but that the lack of meaningful communication often results in inappropriately designed spaces. As identified in the review of literature, beyond standard programming no research guidance is provided to support professionals in gathering information to design these specific spaces. A tool that supports and encourages greater communication and understanding between all parties involved in the design process will result in well-designed, more developmentally appropriate spaces that also support the adults sharing the spaces with the children.

Having parents, teachers, administrators, and designers contribute to the data used to design particular facilities assures that voices from most of the primary users of the space will
be heard in the design process. While children’s voices in the design process are an important addition, as discussed earlier, the input for this research was limited to adult interaction. The tool includes narratives and opportunities for participants to share their thoughts via collaborative exercises and written descriptions. Adding exercises and graphic representations to elicit additional involvement of children will be addressed in the recommendations for future research.

Gathering pertinent data to accomplish the creation of this educational tool was an important part of the study. Using a multi-method, qualitative approach enabled me to collect input from many different individuals in a variety of settings, thus assuring representation of most of the viewpoints necessary to design appropriate preschool spaces. These methods are described in the following section.
Chapter 3
Methodology

This project used a four-part method that included a focus group, individual interviews, development of a communication tool, and a pilot test of the communication tool in the field with feedback from a questionnaire. The types of data needed for my study were varied and necessitated a multi-method approach. Qualitative research methods predominated because of the need for in-depth information, opinions, perceptions, and suggestions about the creation of the communication tool as well as constructive, open-ended feedback about the tool itself.

The focus group format allowed me to interact simultaneously with a number of design and child development professionals, while allowing me to probe for more information and a deeper understanding of their ideas and concerns. This format also provided a basis for individual interview questions, as well as a foundation of that directed the research project.

The individual interviews, conducted at the conclusion of the focus group, provided more in-depth and personal opinions and attitudes regarding the preschool design process. This method allowed me to collect individual stories, suggestions, and experiences upon which I based the development of the communication tool. Returning to the literature after the interviews were completed allowed me to relate research dealing with both children’s and adults’ behaviors within spaces to the responses received in the interviews.

The pilot test of the communication tool provided feedback on its clarity and usability, and verified the contributions of the interviewees. Open-ended questions encouraged the participants to share their views about the written tool in regards to specific areas and to add suggestions as they desired. A section was also included for additional unstructured comments.

This multi-method approach yielded data that assisted me in creating the communication tool and determining its usability in the field. Figure 2 illustrates an overview of the participants, their professions, and the data collection phase in which they were involved. Using a combination of focus groups, interviews, and questionnaires, I have secured rich, full data that support this research study.
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<th>Participant</th>
<th>Profession</th>
<th>Focus Group</th>
<th>Interview</th>
<th>Questionnaire Sent</th>
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**Figure 2.** Participant overview

**Focus Groups**

Focus groups are a valuable tool in qualitative data collection. They allow for interaction with several participants at one time, yet encourage much sharing of ideas, opinions, and experiences (Krueger, 1994). Because of the importance of understanding the needs of the groups identified in this study; child development professionals, design professionals, and parents, it was critical to begin with the focus group format to gain an overview of the desires, needs, and knowledge of the parties involved.
Sample Selection Procedure

Sample selection criteria. The criteria for participation in this study included child development professionals who had been or were currently involved in the design of a new children’s facility or a renovation of an existing facility; design professionals, both interior designers and architects, who had participated in the design of children’s spaces; and parents who had children enrolled in a facility that had recently been or was currently involved in the design process. These individuals were selected because they had some experience with children’s spaces and could offer views based on personal knowledge. This added authenticity to the data collected and provided participants a stronger knowledge base upon which to base their input. The participants were each given a brief overview of the research in order to increase their comfort level with their own contributions prior to being asked to volunteer their time.

Sample selection. The focus group was conducted with a combination of participants including representatives from all three groups targeted. In June, 1998, a class was held at the Child Care Design Institute on the campus of Harvard University and participants included individuals from the child care profession as well as the design profession. A total of 66 participants were in attendance; 55 child development professionals and 11 design professionals. Many of these participants were also parents. Each of these individuals, by virtue of their attendance at the week-long class, had some vested interest in the design of preschool spaces. Most were either currently involved in designing a center or were anticipating some type of involvement in the near future.

On the first day of the Institute, I made an announcement to the entire group briefly describing my research and asking for volunteers to participate in the focus group to be held later in the week. Nine individuals approached me after the session and volunteered to take part in the research, and their names and professions were placed on a list. According to Krueger (1994), successful focus groups typically have from six to ten participants. In reviewing the list of volunteers, it was clear that there was a representative sample from each group and that there was a sufficient number of participants to conduct the group, so a second request for volunteers was not made. The day of the focus group, each volunteer was approached and reminded of the time and place of the focus group. Two volunteers indicated that they would be unable to participate leaving a total of seven volunteers. This was still a sufficient number and representation from each group to proceed (Krueger, 1994).

Sample description. The sample for the focus group consisted of 7 individuals. Five of these were child development professionals including two preschool center owners, two
preschool/child care center directors, and one preschool teacher. Each of these individuals had prior experience in the design process of new centers and volunteered willingly to participate in the study. The final two participants were interior designers who each had an individual design practice in which they concentrated on designing children’s spaces. Both design professionals had several years of design experience with projects that included a variety of children’s environments. Of these seven participants, three were also parents, adding that perspective to their contributions. Four of the individuals participating were from the Eastern United States, one was from Texas, one from California, and one from Illinois. This geographic diversity provided a variety of ideas and experiences from different regions of the country.

Data Collection Procedures

Pilot focus group. A pilot focus group was held on the Virginia Tech campus in the Spring prior to the Child Care Design Institute. This pilot was to test format, questions, and procedures, and to obtain feedback from the participants regarding changes that needed to be made prior to conducting the formal focus group. Six participants were recruited for this exercise; three design professionals who were also graduate students, and three child development graduate students with teaching experience. Two of the six were also parents, and had been made aware that their “parental” thoughts on the process were also needed. These individuals were not involved in the focus group activity used for data collection. While none of these individuals had participated in the design process of a new preschool facility, they were each experienced in their professional area and could give sufficient feedback about the procedures and questions included in the focus group format. I acted as the moderator, and an assistant moderator was also involved to help facilitate the group as well as to take notes on the responses of the participants. An audio recording was made of this session.

Three questions were presented to the group (see Appendix A), and after each question participants were asked to write their responses on index cards provided. When the responses were recorded, the group was asked to work together to organize the responses into three to five categories. When this was complete, the assistant moderator recorded these categories on large sheets of paper and displayed the responses for discussion. The discussion that ensued further clarified the written responses and allowed the participants an opportunity to expand on their ideas.

At the completion of the pilot test, a discussion was held regarding the format and content of the focus group. Several suggestions were made for changes that were incorporated into the focus group conducted in Boston. The primary suggestion was to include a question
about improving communications between design professionals, child development professionals, and parents during the design process. Participants stated that since one of the main points was to look at communication issues, a question addressing the topic should be included. A suggestion to revise the number of attributes from five to three in the questions about interior features for adults and children was also incorporated. Finally, the pilot focus group used a written format for each question, and participants suggested a discussion for the question about computer use, availability, and comfort to more efficiently address the issue.

Focus group. The focus group held at the Child Care Design Institute consisted of the sample described previously, and incorporated changes suggested in the pilot focus group explained in the previous section. One additional question was added and two questions were modified (see Appendix B) and a total of four questions were discussed. I acted as the moderator and an assistant moderator was involved to aid in the facilitation and notetaking throughout the focus group.

The first two questions were approached in a written format as in the pilot study. A question was asked to the group, they were given time to respond to the question on index cards, then they were asked to work as a team to group the cards in categories. Upon completion of the grouping exercise, a discussion took place about the categories they created and the responses they included under each category. The final two questions were asked and addressed in a discussion format as opposed to the written format used in the pilot group. Each participant volunteered information, and the results of all responses are discussed in the following chapter.

Data Analysis Procedures

The focus group was audio taped and detailed notes were taken during the group by both the moderator, when possible, and the assistant moderator. Upon completion of the focus group, a debriefing between the moderator and assistant took place to verify the notes and the general understanding of the group results. There was consistency between the notes taken indicating reliability in the data collected (Silverman, 1993), and, during the debriefing, parts of the audio tape were reviewed for clarity and consistency with the notes.

Notes taken were entered into a computer and initially organized based on the question being asked and the person taking the notes (e.g. moderator’s notes were recorded separately from the assistant moderator’s notes). The audio tape was played in its entirety two times and audio information was cross-referenced with the notes taken to assure completeness in the data recorded.
Krueger (1994) states that focus group data analysis must be practical, systematic, and verifiable. He describes four types of analysis including transcript-based analysis, tape-based analysis, note-based analysis, and memory-based analysis (Krueger, 1998). By combining three of these analysis strategies, tape-based, note-based, and memory-based, with Spradley’s (1979) suggestions about thematic analysis of qualitative data, the data from the focus group were thoroughly organized and analyzed. Using the complete set of notes created by combining the moderator’s notes, the assistant moderator’s notes, and the additional notes from the audio tapes, I began to read and reread to look for commonalities or themes among the data. I read the notes twice before beginning to identify specific themes to make sure I was thoroughly familiar with the data. During subsequent readings, I began to make notes of emerging themes and details supporting those themes. Using the themes identified, I proceeded to create questions for the individual interviews to be conducted for further data collection.

Individual Interviews

The individual interview, sometimes referred to as an ethnographic interview, is used to gather detailed information from individuals that are in some way involved in the subject being researched (Spradley, 1979). The value of the ethnographic interview is that it goes beyond gathering information and allows the researcher to discover and understand the meaning behind people’s words and actions (Bogdan & Biklen, 1992). This data-gathering technique allowed me to gather detailed information from the participants, clarify their meanings, and verify their needs using feedback techniques to assure the validity of my notes and interpretations and to guide the development of the communication tool.

Sample Selection Procedure

Sample selection criteria. The interview portion of this data collection procedure was an important opportunity to examine the opinions and experiences of child development professionals, parents, and design professionals regarding preschool design. Therefore, the personal experience of the participants in the design process was critical. For that reason, the criteria formulated for the sample were based on personal experience with the design process. Child development professionals, including administrators, owners, and teachers, must have been currently involved in the design or renovation of a preschool center or have had recent experience (within the past two years) in the process. Criteria for parents were to have a child enrolled in a preschool facility that was undergoing or had recently undergone a renovation or
the design of a new center. Design professionals must have had recent experience designing some type of children’s space, either a preschool or other facility primarily supporting children.

Sample selection and description. Thirteen interviews were conducted during this phase, with five child development professionals, four parents, and four design professionals. Many participants in the interviews were recruited from a preschool facility in Southwest Virginia currently in the process of designing a new building. The experiences of these participants were current, and they were clearly interested in sharing their ideas and suggestions for making the process a better experience. The owner/administrator and three teachers were interviewed about their experiences during this round of data collection. The fifth child development professional, another owner/administrator from Vermont, was approached during the Child Care Design Institute and agreed to participate in a telephone interview. The four parents interviewed were also from the Southwest Virginia preschool and had been involved to varying degrees in the planning and design process.

Three design professionals were also recruited during the Child Care Design Institute. The first was an architect from Indiana currently designing a mid-sized preschool who had originally volunteered to participate in the focus group but was unable to attend. The second, an architect from New Mexico, had designed several residential children’s spaces and was currently consulting on a daycare center in her community. She also had volunteered to take part in the focus group but was not able to participate. The third architect was a corporate architect in the KinderCare headquarters in Oregon, and was responsible for the design and construction of KinderCare facilities nationwide. The fourth design professional was an architect in Southwest Virginia who was involved in the design of the Southwestern Virginia preschool identified earlier. Several of the teachers and parents participating in this study were involved in this preschool project.

Data Collection Procedures

Prior to the interviews, a questionnaire was developed for each target group (see Appendix C). The questionnaire for child development professionals and parents was the same since I was investigating their experiences as “clients” in the design process. The questions for the design professionals were the same with two exceptions that addressed their own approach to design and to working with client groups. Using the same or comparable questions in each interview enabled more structured comparisons of the data collected to be made (Silverman, 1993). The seven questions were used as a base for each interview, with supplemental questions asked as needed to clarify information given by the interviewee.
Four telephone interviews were conducted and taped in a recording studio on the Virginia Tech campus. The interviews were scheduled using telephone or e-mail communication, and I called each interviewee at the appointed time. Each interview lasted for 45 – 60 minutes. These four telephone interviews included three design professionals and one child development professional. At the beginning of each call, I briefly explained the research, reviewed the Informed Consent form and asked if they had any questions and were willing to proceed. I made it clear that I intended to record the sessions, and asked for their permission before beginning to record. Upon receiving their permission, I began recording and asking questions as shown on the questionnaires. During the interview, I took notes in addition to recording, and queried the participants for clarification of their answers if there was any confusion. Informed consent forms were sent to each participant explaining the research, confidentiality, and their rights. Each participant in the telephone interviews signed and returned the forms.

Nine interviews were conducted face-to-face with participants in Southwest Virginia. Each interview was scheduled at the convenience of the participant, and was conducted in a convenient location chosen by the interviewee. Prior to each interview, the participant was given a copy of the Informed Consent form, it was reviewed, and they were given an opportunity to ask any questions or discuss any concerns they had with the research or format. They were then asked to sign the form and return it to me, and were each given a copy for their personal records. Upon completion of this consent process, I asked for permission to record the session and began the interviews. All participants granted permission to record, and questions were addressed as in the telephone interviews. Written notes as well as audio recordings were made during each interview.

Data Analysis Procedures

At the completion of each interview, the notes were typed as they were taken during the discussion. I read the notes to make sure I understood the responses, then listened to the audio tape of the interview and made additional notes on the sheet. These notes were entered into the computer as a supplement to the original notes and a copy printed for review. Again I read the notes and compared the notes to the audio tape to assure accuracy. Upon completion of the second audio review, final notes were entered and sheets printed for my review. This procedure was followed for each interview until all notes were printed in final form. The initial data entry was organized by individual respondent with their answers entered under each question (e.g. all responses from parent #1 were organized together).
With the final note forms from each interview complete, I then reorganized the responses, arranged them by group (e.g. child development professional responses, design professional responses, and parent responses), and combined the answers to each question. For example, all of the responses by design professionals to question #1 were placed on a sheet together, with a division between each person’s response. This enabled an easier review of all of the responses to each question. Each different thought or single response was numbered to facilitate grouping and organization. I then read and reread the responses looking for themes and trends within each group. The themes identified and the specific areas each question addressed in the research are discussed in depth in Chapter 4. The responses to the questions formulated the content and structure of the communication tool that was created.

Overview of Communication Tool

Based on the data collected in the focus group and the 13 individual interviews with child development professionals, design professionals, and parents, a communication tool was developed to guide the involved individuals in the preschool design process. This communication tool includes descriptions, exercises, and information to help participants in the design process understand how better to communicate their needs to others and have a clearer understanding of the process they will encounter when designing new or renovated facilities.

The tool organized the themes in such a way as to help educate others involved in the design process in the future. The themes identified in the data became the organizational structure for the workbook. To verify the validity of the information included in the communication tool, and to assure that the concerns heard in the focus group and the interviews were truly addressed, the tool was sent to the research participants for their feedback and suggestions.

Questionnaire

The final round of data collection in this research consisted of obtaining participants’ responses to open-ended questions regarding the communication tool. This method allowed the individuals to set their own schedule to review the work and to answer the questions in the manner in which they felt most comfortable. These written responses also acted as a check of validity of the previously collected data, since those data were used in the development of the communication tool. While differing opinions exist on validity and reliability in qualitative research (e.g., Silverman, 1993; Spradley, 1979), Reason and Rowan (Reason & Rowan, 1981) believe that respondent validation is an excellent approach to verifying data. They feel that presenting preliminary results to the participants and obtaining their reactions assures a more
reliable study. Opportunities were provided for the respondents to address whether they felt their ideas and input had been adequately reflected in the workbook they read.

Sample Selection Procedure

Sample selection criteria. The criteria for selection of the sample to participate in the final round of data collection were the same as the criteria for the previous data collection methods. Involvement in the design of some type of children’s facility was useful in helping the participants review the communication tool and respond to the questions in an authentic manner. Most respondents had participated in at least one of the previous rounds of data collection, although new participants were added as described in the following section.

Sample selection and description. The sample for this final data collection procedure included all of the previous participants in both the focus group and the individual interviews. They were asked to review the booklet and provide feedback because of their involvement in the initial data collection, and their review not only provided feedback about the communication tool, but also served as a check of validation regarding the previous data gathered. Because of their intimate involvement and familiarity with the work, they were considered “experts” (Shambaugh & Magliaro, 1997) and their input important to the final work. Since a question on the questionnaire asked if they felt their ideas were reflected in the work, an important check of the data interpretation was addressed (Spradley, 1979).

Six additional individuals were added to the sample to act as “connoisseurs”, or “generalists who can scrutinize your content and design within a wider context than that of experts” (Shambaugh & Magliaro, 1997, p. 224; Eisner, 1994), and to add input from outside the initial research. Three of these individuals were chosen because they are design professionals with some experience designing children’s spaces, predominantly residential spaces. One is an independent interior designer in the Washington, DC area who specializes in designing all types of high-end residential environments. The second is an interior designer in Montana who has a design firm that exclusively designs children’s environments, both residential and commercial. The final design professional is a professor of interior design in Georgia with years of experience in both commercial and residential design, who has designed some spaces to support children during her career. Three additional individuals were chosen because they were directors and/or administrators of child care facilities that had recently been involved in designing new environments for the children. These new child development professionals were recruited from Colorado, Indiana, and Iowa.
Data Collection Procedures

Questionnaires were developed to gather information related to the usability and validity of the communication tool created from the data collected. Three separate questionnaires were created; one for design professionals with eight questions, one for child development professionals and parents with eight questions, and one for new participants with seven questions (see Appendix D). All questions were either identical or addressed an identical issue from the viewpoint of each profession. The questions were reviewed by my doctoral advisory committee prior to submitting them to the participants, and minor revisions were made in wording to clarify the meaning of some questions.

A total of 26 questionnaire packets including a cover letter (see Appendix E), the communication tool (see Appendix K), the questionnaire, a return envelope, and an Informed Consent form (see Appendix H) were sent to the participants. Each individual was asked to read the communication tool, answer the questions in the manner most comfortable to them, and return the entire packet to me. Respondents were given a month to complete the task. Following Dillman’s recommendations for increased mail returns (Salant & Dillman, 1994), three weeks after sending out the packets, I followed up by sending each participant a post card thanking those who had responded for doing so, and requesting that the others please return their responses as soon as possible (see Appendix F). Because of the holiday season, I decided to extend the deadline date for returning the questionnaires, and made subsequent personal contacts with those individuals still not accounted for either by phone or by e-mail to inform them of the revised deadline and to again request their participation. A total of 16, or 62% of the questionnaires were returned.

Data Analysis Procedures

The analysis of data collected on the questionnaires was conducted in a manner similar to the analysis of the interview data. The responses were entered into the computer as they were received and organized by respondent. When all of the responses had been entered, the data were arranged by question and by group responding (e.g. all responses to question #1 from child development professionals were grouped together). This enabled an easier comparison of responses and identification of themes or overall opinions reflected. Each response was numbered and reviewed several times looking for patterns or themes in the responses to each question. Some questions elicited thematic responses, others simply showed agreement or disagreement with the idea addressed. Each of these is discussed in detail in the following chapter.
Confidentiality of the Participants

Confidentiality of participants is an important issue in any type of research. To assure the confidentiality and anonymity of the participants in this study, and to insure conformity with the requirements established for research involving human subjects, I obtained approval to conduct this research from the Institutional Review Board at Virginia Polytechnic Institute and State University (see Appendix G). At the beginning of the focus group, I distributed and explained to the participants the Informed Consent form (see Appendix H). Each participant was given a chance to ask questions to clarify the information, then was asked to sign and return the form. Copies of the forms were provided to each participant. Informed consent for interviews was conducted in much the same manner. A form was either provided to the interviewee prior to the interview or read to the interviewee over the phone and the research was verbally explained. The participant was given a chance to ask questions, then was asked to sign and return the form. A copy of the form was given to each participant. A similar procedure was used with the written questionnaires, with the exception of the verbal discussion about the research which was explained on the form. The consent form for the questionnaires included a brief description of the research being conducted, and asked that the participant call or e-mail me if they had any concerns or questions prior to completing the questionnaire. The Informed Consent form was to be returned with the questionnaire, and a copy was provided in the packet for the participant’s records. Each participant was also given an option of receiving a copy of the research results and was asked to complete a separate form if they wished to receive additional information.
Chapter 4

Results

Introduction

This research used a multi-method qualitative approach, which allowed a variety of data to provide a depth of understanding regarding the designing needs of the participant groups. Each of the research questions was investigated through the focus group, individual interview, and questionnaire, and followed a progression through the inquiry leading to a final conclusion and product.

Each method revealed information and data that informed the next method (see Figure 3). The focus group provided broad information that aided in defining the problem. This research method revealed the need for more detailed information, thus leading to the interviews. Interviews provided more detailed information about the problem being researched, and provided a clear direction regarding the methods of addressing the problem. Finally, the questionnaire provided specific feedback on the method chosen to address the problem, as well as suggestions for additional thoughts on the issue.

Providing a variety of contexts, allowing the participants to choose the environments in which they interacted, and setting a positive “tone” for the interactions encouraged more comprehensive data collection and afforded richer data. Both Bronfenbrenner (1979) and Gardner (1993a) supported the belief that context is important in learning, and that context guides not only the research conducted, but also the methods used. Gardner also believed that people needed to be allowed to express themselves in a variety of methods. Multi-method data gathering provided opportunities for self-expression.
Figure 3. Progression of data collection methods
**Focus Group**

The focus group, as described in Chapter 3, included 7 participants. These individuals included child development professionals and design professionals, each having experience and interest in the design of preschool facilities. The focus group addressed four questions (see Appendix B), and discussed each question to ascertain the participants’ ideas and feelings about the topics.

Initially, the focus group addressed specific needs within the preschool to provoke thoughts about the facilities and to create an open atmosphere of sharing and discussion. For the two opening questions, the participants were given six index cards upon which to write their responses (three responses per question), then they worked together to group these responses into categories. This group dynamic not only provided a consensus about the categories identified, but also created a greater connection between the participants, helping them to feel more open about sharing their personal views and experiences.

**Interior Features for Children**

The first question asked was:

> “What are three important interior features specifically for children that should be included in the design of preschool spaces?”

The categories identified by the participants in response to the first question were (a) child-friendly qualities, (b) privacy/place to break away, (c) whole body use, and (d) messy play.

Nine of the responses identified **child-friendly qualities** which included details and amenities, the scale of spaces, aesthetics and quality of the space, accessibility and versatility of spaces to be used in a variety of ways, and the incorporation of natural light. The respondents saw these issues as important in helping to empower children and foster a sense of competency as well as visual stimulation and beauty. Well-planned spaces that were fairly predictable would help the children to organize their thoughts and to move through the activities that most interested them. Using quality materials and considering the aesthetic appeal of the spaces fostered a sense of appreciation and responsibility within the children.

Discussions about **privacy and places to break away** centered around children having private spaces, areas to be quiet, soft areas, and places to get away from other children during the day. Responses expressed a concern that constant stimulation during the day could lead to exhaustion or to overstimulation causing potential behavioral problems. While supervision and visual access to these places were identified as important, providing a place for children to
“retreat” was seen as paramount. Five of the responses from the participants were placed in this category.

Providing spaces to allow children to use their whole body was identified as another important feature. Five responses were placed in this category and included features such as providing open spaces for gross motor play, creating an on-going dramatic play area, and separating quiet spaces from those supporting more active play. Discussion also included identification of the different types of play children engaged in during the day. Providing versatile areas that encouraged children to use their bodies in different ways throughout the day was identified as an important factor in the children’s overall learning.

The final category of participants’ responses was the creation of an area for “messy play”. This term was used specifically by the participants in the discussion, probably as a result of presentations conducted at the Design Institute using the term to describe particular zones within a preschool classroom. While this could have been included in either the child-friendly or the whole body use categories, the participants chose to break these activities out separately because of the varied implications for this type of play. By providing “messy play” the children are often allowed to use their senses in different ways (e.g. discovering the changes in physical properties such as texture when materials such as water and sand are combined). These activities provide for a fuller learning experience on the part of the child. The other major issue included within this category, which was recognized by the participants as a critical factor, was maintenance of the messy play area. If an area is easy to clean, the teachers will be more receptive to providing messy play activities, thereby increasing opportunities for a wider range of experiences. One clearly influences the other, and is as much an adult issue as a children’s issue.

Interior Features for Adults

The second question probed for the same type of information from a viewpoint of supporting adults within the preschool. Question #2 asked:

“What are three important interior features specifically for adults (including parents, teachers, administrators, and others) that should be included in the design of preschool spaces?”

The focus group participants identified five categories for this question including (a) teacher spaces, (b) safety and supervision, (c) storage, (d) user-friendly areas, and (e) beauty.

Teacher spaces were quickly identified as personal spaces for coats and other accessories, quiet space for breaks or phone conversations, work space accessible to all staff,
and comfortable adult-sized furniture. These are features of any typical workplace, but since the nature of preschool and child care is often focused on providing for the children, the necessary support spaces for the adults are sometimes overlooked. There were five responses placed under this category.

Safety and supervision of the children was the next category. Four responses dealt with the teacher’s ability to see and supervise the children, and to have visual access to all parts of the room at once. There was agreement among all of the participants in the discussion that this visual access was an extremely important issue, although not all of the participants chose to create a written response within the category.

The next category, storage, also elicited strong agreement from the entire group, although only four written responses were placed under this heading. The responses went beyond simply identifying the need for storage, however, and specified type and placement of storage needed. One response stated that the storage should be well organized and functional, another stated that it should be efficient “point-of-use” storage located within the classroom, and another participant identified a need for storage of personal items in the classroom. While the last item could have been included in the “teacher spaces” category, the respondent saw it as more of a storage issue than a teacher support issue. The need for specific storage was a point agreed upon by everyone.

The fourth category, user-friendly areas, dealt mainly with maintenance and ergonomic issues. Three responses addressed height of counters and cribs, as well as ease of cleaning of all surfaces and areas within the classroom. Explanations of the responses in the discussion included the idea that the less energy required to operate within the space (i.e., bending over excessively to work on counters) and the less time required to maintain the space, the more time and energy the teachers would have to devote to the children.

Finally, the fifth category was beauty of the space, and although only one response was placed in this category, it is an important consideration. Spatial quality and appeal were also identified in the comments about children’s needs within spaces, and although the written response was not overwhelming, awareness of beauty and quality does exist and allows the users to think about preschool spaces in a broader sense. As identified in the focus group, the function of these spaces was the primary concern, and the aesthetics were “not even part of the discussion”. To build a greater appreciation for the space within everyone, aesthetics need to be an important part of any design discussion.

The discussion and interaction that took place in response to these two questions allowed the participants to become familiar with the topic and to begin formulating more ideas.
about what is important in children’s spaces. The following question moved them from thinking about the physical nature of the spaces to methods of achieving these spaces when in the design process.

Communication Issues
The next question moved the discussion into the main topic of the research and asked:

“What could be done to improve communication between design professionals, child development professionals, and parents when designing preschool spaces?”

In asking the question, I explained that there was not to be an assumption that there were always problems, but to approach their responses with the idea that any process could be improved and we were looking for ways to improve the design process. A lengthy discussion followed this question, and much valuable information was shared by each participant. The data collected during this phase were compiled into 30 responses which were organized into themes, and the themes and coding details are found in Appendix I. Each note or response was coded according to this scheme, and many of the responses addressed more than one of the themes that appeared in the coding. Four primary themes emerged as responses were analyzed. The themes included (a) education/information exchange, (b) communication skills, (c) contact between participants, and (d) administrative issues. Each of these themes is reviewed in the following sections.

Education. The education of design professionals about child development issues and child development professionals about design issues was a primary topic in the focus group discussion. In reviewing the notes coded, 17 out of 30 responses dealt with this issue in some form.

Many of the responses from child development professionals revolved around the effort expended trying to help design professionals understand the importance of the issue of children’s physical environment. A clear desire was expressed on the part of child development professionals for designers to spend a significant amount of time in the center interacting with the teachers, parents, and children prior to starting the design process. Child development professionals saw this as a way to help them understand the every-day workings of the center. One center director stated that:

“I felt like I was always fighting battles to get the center set up for the children, not to make some grand architectural statement.”
Explaining the concept of “child-sized” spaces was a concern for the child development professionals, and they expressed difficulty in getting design professionals to understand the idea. Child development professionals noted that the design professional must be familiar with the regulations, licensing requirements, and grant/funding contract specifications that could affect or determine many of the decisions made.

Design professionals, addressing the same issue, shared that child development professionals needed to visit a variety of centers and educate themselves about different ideas and innovations. Visiting centers together with the design professionals was suggested as a way to increase communication and help bridge the “language barrier” many of the participants identified as a problem. Two participants also suggested that the child development professional provide specific information to the design professional on any regulations that might affect the facility beyond the standard building codes, ADA, and fire and health codes. Bringing in new research from both fields, design as well as child development, and information from popular press publications to spur idea-generation was also suggested.

Another issue of concern to the child development professionals was feeling inferior to the design professional hired to design the children’s facility. They expressed concern that child care is not always seen as a profession and in their experiences, design professionals had sometimes dismissed their knowledge and experience when gathering information related to design discussions. The struggle to be heard and to have children’s issues recognized and teachers and parents valued in the process of design was a recurring theme throughout this part of the discussion. Gender entered into the discussion at one point, and many child development professionals felt that working with male architects was sometimes a difficult situation, but were not aware of methods of choosing design professionals, either male or female, that could provide them with the support and collaboration they needed.

Lack of understanding of the design process was identified as a problem that added to the child development professionals’ feelings of inadequacy, often because they were not aware of the next step or of what types of information they would need to provide. One design professional gave an example of this problem when she stated:

“Clients often don’t know the sequencing of the design process so they start to give too many details too soon. This is really frustrating since we can’t do anything with this information until much later in the process. They have to trust us that we will eventually get around to asking for that type of information.”

Upon completion of this statement, a discussion ensued about how to better help the child development professionals understand the design process and the sequencing that is associated with it. Child development professionals agreed that having information about the
design process early in the project would help them feel better about their contributions and prepare more adequately. The child development professionals needed more information to feel "empowered" to stand up for what they needed and for the needs and rights of the children in their centers. At this point, one design professional said that a binder of important things in the process of designing children’s spaces was needed to support everyone involved. Another design professional suggested that the child development professionals ask for visual presentations from the design professionals they hire, helping them have a clearer understanding of the intent and direction of the designer. Finally, the first design professional suggested that the budget for predesign, including planning and programming, be sufficient to cover adequate collaboration time between the design professional and the client group.

In summary, the education of each group within the project was an important issue that affected sharing of information, collaboration, and ultimately the spaces created. Issues such as design professionals spending time in centers before designing them, tending to interpersonal relationships that need to begin at the time of choosing a design professional, and understanding the format and sequencing of the design process were seen by the group as major factors in improving communication when designing children’s facilities.

Communication skills. Types of communication necessary and communication skills needed for effective design projects framed the next theme identified in the focus group. Fourteen out of 30 responses addressed this issue in some fashion. This theme primarily looks at the skills needed and types of communication necessary for successful designs.

One of the first points made came from a design professional. She stated most emphatically that everyone in the process needed to recognize what they knew and did not know coming into the project, leaving egos out of the mix completely. Examples were shared by both design and child development professionals of team members who believed their answers were the only ones with merit, and how the team and the project suffered as a result. Some child development professionals shared experiences of confronting arrogance in design professionals who didn’t listen or try to gather information about the real needs of the center. Design professionals, on the other hand, provided examples where the clients abdicated their role as a guide in the process and turned the responsibility of the center design over to the design professional with little or no support or guidance provided.

Another critical communication issue identified by the participants was the definition of team members’ roles early in the program. One child development professional also said that the identification of the contact people and decision-makers was an important point. She shared this idea by stating:
“It’s especially important for us to know who will ultimately make the decisions, especially in ‘committee projects’. Otherwise time is wasted when we are all giving input but only one person will make the final decision. We need to get the input from that person.”

The group agreed that helping individuals understand the expertise they bring to the design process was identified as another way to strengthen the commitment of the contact people, and to help individuals share their ideas. The focus group acknowledged that when team members are clear about their roles, responsibilities, and what they have to contribute to the process, they are more comfortable and ultimately more empowered to work on behalf of the children and the center to create an exceptional facility.

**Teambuilding and collaborative methods** were cited as important tools for communication, although as expressed by several participants, many individuals are not schooled in the use of these techniques. As expressed in the focus group, the architect or design professional often is expected to take the lead in meetings and in creating a cohesive team; however, these individuals seldom are trained in any type of group dynamic process. One design professional suggested that it might be necessary to bring in professionals trained in group dynamics to set up a structure from the beginning. Most of the participants disagreed with this, but did believe that identifying methods of decision-making and establishing some type of collaborative process early in the project was necessary. Each project is unique, and as the focus group participants observed, must be approached differently. But all acknowledged the importance of working together to create a cohesive and enjoyable project.

**“Speaking the same language”** was also a point that applied to this theme. Identifying or creating a common language was identified as an important activity to keep lines of communication open and allow for questioning and clarification of meanings and terms used by each team member. One design professional suggested joint field trips to different centers, as discussed previously, to aid in the communication. By visiting the centers together, then spending time discussing what was observed, the team members develop their own common language that is useful throughout the process.

Some issues overlapped both the “education” theme and the “administrative” theme. These included the necessity of **equal communications** to alleviate the feelings of inferiority in the child development professionals, identifying and articulating a clear vision, mission, and philosophy and communicating those to everyone on the team, and the use of **multi-media** by both the design and child development professionals to express ideas with greater clarity and visual understanding.
This section discusses the recognition of specific communication skills and roles within the project team necessary to assist in the creation of a successful project. These include a clear understanding of the roles of each team member, knowledge of group dynamics and respect for the expertise each participant brings to the project, and strategies for creating a common language to help each profession understand and deliver information with greater clarity.

**Contact between participants.** This theme, while similar to the issue of communications, deals directly with the individuals and groups of people that need to be in contact with one another during different phases of the design process. Seven out of 30 responses included some reference to the contacts necessary for a successful project. Involving many different parties in the data collection process during programming was seen as paramount.

Again, the importance of the design professional making contact with and interacting with all groups involved in the preschool was emphasized. Individuals involved in preschools believed to contribute significantly in the process included parents, teachers, maintenance employees, nutrition specialists/cooks, and administrators. Gathering input from everyone using the space was recognized as a critical issue and the collaborative input would help to assure that all interests were considered when the space was designed. One child development professional observed:

“We need to include all of the adult staff and the parents in the planning. They use the space a lot in addition to the children.”

Increasing contact between all groups involved in the preschool, or inter-center communication, as identified in the focus group, also assures a greater understanding of everyone’s concerns and fosters respect among the participants. With increased familiarity and respect, as stated by one participant, more ideas are generated and better projects result. Inter-center contacts were also recognized as important since identifying the decision-makers in the project and including them in meetings and key discussions supports a more cohesive and successful final product.

In summary, the focus group participants felt that to help them more fully understand the needs of the center, the design professional needed to take advantage of the expertise of individuals working in various positions in the preschool. The participants also felt that contacts within the center were critical for sharing as well as gathering information. Working together in a variety of modes allowed for better communication, better facilitation of the process, and ultimately a better design.
Administrative issues. This theme dealt with a variety of issues that the center needed to address prior to the design of a new facility. Six out of 30 responses applied to this theme. These administrative topics included the need for a center to identify a vision, mission, and philosophy to guide the process, and to be clear about their own agenda prior to coming to the design professional for help. In addition, budgets, funding sources, timeframes, and schedules were discussed. By resolving administrative issues early in the process, it was agreed that time was not wasted when questions arose about specific items, making it possible to more efficiently use the time of all involved. The importance of identifying the needs of the center as well as the requirements of other influential organizations such as funding agencies, was noted clearly in the discussions.

Timeframes and schedules were recognized as critical issues that often caused problems in the design process. The child development professionals expressed concern because they felt that design professionals sometimes did not understand the time restrictions imposed by funding agencies or administrative boards. As one child development professional expressed:

“We would like to be able to take the time for good collaboration, but sometimes deadlines that are out of our control are tight and don’t allow for the type of communication we would like to educate everyone involved in a thorough manner.”

In addition to schedules, budgets also were mentioned but not discussed at length. Participants recognized the need to allocate funds to the predesign phases including planning and programming that would sufficiently cover the educational process as well as visits to different centers. Individuals involved in the focus group also acknowledged that budgets were often tight and that each center must deal with that issue as the situation presented itself.

Finally, the understanding that the center must have a clear vision, mission, and philosophy to provide direction to the project was apparent. Formulating goals and agendas for the new center were paramount, and one of the design professionals explained that designers were available to provide input in this planning phase if they were hired to do so. This came as a surprise to many of the child development professionals who believed that design professionals only provided design services and that the center was responsible for preparing the predesign information. The reactions expressed have direct implications for the first theme of educating child development professionals about the services available to them throughout the design process.
Computer Use

The final question of the focus group was a discussion about the computer programs available to the center and the use of computers within the centers. The question was:

“What types of computer programs do you use in your centers? What is the level of use and comfort by teachers and parents within the center?”

Each of the five participants involved in child care responded, and the primary use of computers centered around using programs to aid in the administrative functions of the center. These programs included ChildCare 2000, GroupWise, ProCare, and QuickBooks. Other programs identified were Word, Excel, and PrintShop. One participant was fairly unfamiliar with the programs used and said that her center had “some type of word processing program, maybe Windows 95”. Two participants identified e-mail, and no one identified use of the Internet as a response. When probed about the Internet, most said they had access, but did not use it in their jobs. I also asked about programs such as PowerPoint or other types of graphics programs, and no child development participant had access to these.

When asked about use of computers and comfort level within their centers, the responses were that the administrators generally had a fairly high comfort level using computers and used them relatively frequently. The teachers, however, were perceived by the participants to have a much lower level of comfort using computers, and were not identified as using the computers with any frequency.

Summary of Focus Group

The focus group provided important general information about the ideas and opinions held by both child development and design professionals regarding the important features needed in preschools for children and adults, the communication issues faced in the design process, and the use and familiarity of computers in preschool centers. Interior features were identified that were considered important to the development and health of children as well as features that were supportive of the adults occupying the same spaces. Clearly assistance is needed in the design process, most specifically in educating child development professionals about the process and supporting them in guiding design professionals into the unique world of preschool environments. Finally, responses alluded to the lack of computer use and availability within preschool centers in general, although some directors used support programs extensively in their administrative duties.

As a result of these data, the need for some type of support/educational tool is seen. Individual interviews were conducted upon completion of the focus group data analysis, and the
questions formulated were based on the information gathered from the focus group participants. The data sought in the interviews involved a more detailed look at the issues than with the focus group.

**Individual Interviews**

Interviews were conducted with 13 individuals representing the three groups identified in Chapter 3. These individuals included four design professionals who had past experience or were currently involved in designing children’s facilities, five child development professionals including teachers and administrator/owners who had been or were currently involved in designing new preschool facilities, and four parents who had children enrolled in preschools that were designing a new children’s structure.

The interviews were conducted to gather additional information about the preschool design process. Questions were asked to determine whether a tool was needed to help educate the individuals involved in the process, the format most appropriate for the tool, and specific topics to be covered in the tool (see Appendix C). The focus group provided general support for the tool itself, a suggestion of a paper-based as opposed to a computer-based format for the tool, and an overview of topics to be covered. Interviews were used to further examine the research questions and to verify and expand the focus group data.

**Need for a Communication Tool**

The need for some type of tool to support child development professionals in the design process was identified in the focus group, and further supported in the interviews conducted with child development and design professionals, as well as parents. This need was investigated in the interviews using questions about the amount of time design professionals spent educating their clients about the process of design, the familiarity level of child development professionals and parents with the design process, and the effect educating clients about this process had on the information provided throughout the project. The results of this topic follow.

**Design professionals’ responses.** The first question asked of the design professionals was:

*“How much time do you spend familiarizing clients with the design process?”*

Each of the four designers interviewed indicated that they spent at least some time discussing this topic. Their approach and the time spent, however, varied significantly. One design professional stated that since he was in corporate child care, his clients were often “in-house”
and he did not need to spend much time discussing the design process since they were familiar with the practice. He did say that when the directors of the new centers are hired, they are sometimes briefed on the process to the extent that their input is needed in various stages of the design. The time he spends varies with the experience level of the individual.

A second design professional was very committed to educating her clients, and said that she spends her first meeting with the client discussing the client’s needs and wishes, then she explains the process she will use to achieve the desired product. She talks to them about the formal programming process, and what will be expected of the client during each phase of the design. She did indicate that although this is the way she typically begins projects, some projects are on a “fast-track” schedule and, as a result, she doesn’t spend as much time educating the client as she would prefer.

The third design professional acknowledged the need to educate clients in the process used to design spaces, but said that he rarely spent formal time discussing this with clients. He indicated that:

“… when a client isn’t familiar with the process, we’ll have brief conversations about deliverables. Most of the clients I work with are pretty familiar with the process we’ll be using.”

In other words, he only addressed the design process in terms of deliverables, or “products” he would provide for the client. An explanation of the process used to gather information, plan the space, or move through the project was not discussed with the client.

The fourth design professional indicated that he did not hold formal meetings to talk about the process, but that explanations were ongoing throughout the project. He did express that most of the discussions centered around the American Institute of Architects (AIA) Contract and the breakdown of services as outlined in the contract signed by the client. This document details the products to be delivered and the manner in which they are to be delivered by the design professional, but does not address the process of gathering information or the expectations of the client in the information-gathering phase of the design.

When asked about the individuals involved in the discussions about the design process, the answers varied, but typically included the owner and /or director of the facility, the developer financing the project, the Operations Department in the case of the corporate architect, or the appointed client representative. Not one of the design professionals identified teachers within the center, parents, or other preschool support personnel as clients included in the discussions about the process.

The final question asked of the design professionals was:
"How does spending time familiarizing the clients with the design process affect their provision of appropriate information?".

All four of the design professionals agreed that when a client is better educated about the process, they provide better and more appropriate information to the designer. One design professional stated:

“The more the client understands what the architect is doing and what information is required, the easier it is for them to provide appropriate information. A better educated client equals an easier architectural job, and an easier job equals a better product. Education demystifies the process for the client.”

In summary, while all of the design professionals agreed that education of the clients was important to help them provide better information to use in designing, only one out of four spends dedicated time educating their clients about the design process, responsibilities, and expectations. The other three may discuss the process with the client on an "as needed" basis, but typically rely on the architect's AIA contract to guide their discussions. This contract is not only an incomplete document for educating clients, but can also be difficult to understand because of the legal and architectural language used throughout.

Child development professionals' responses. Questions directed at the five child development professionals dealt with their knowledge of the design process, their past experiences with design professionals spending time explaining the process, and the effect the explanations had on their ability to provide appropriate information. Responses to these questions echoed some of the discussion that took place in the focus group, verifying that the interviewees' experiences were not unique.

The first question posed to this group was:

“How familiar were you with the design process when you began the job (of designing a new preschool facility)?”.

The first interviewee, an administrator/owner, responded that she was “pretty familiar” with the process. She had designed her own home, and her father was a carpenter, so she felt that she had been involved in the design process enough to have an idea about what to expect. The second interviewee, another administrator/owner had a different response. She said that she was not familiar with the process, even though she had reviewed the contract when the architect gave it to her to sign. She was not familiar with the terminology in the contract and said:

“I didn’t know the different types of plans or what people were going to need from me. I always had to keep asking people ‘what’s next?’ to keep up with what I needed to be doing.”
The teachers interviewed each stated that they were not familiar with the process prior to the beginning of the job, but two expressed the fact that their director had spent time with them helping them to understand what was going to happen. They felt comfortable with the process since the director was communicating directly with them and involved them as much as possible.

The second question asked was:

“How much time did the design professional spend with you explaining the process?”

The first administrator/owner was pleased to describe how the architect they hired spent time with the entire center, went through exercises, and communicated clearly about the upcoming process. She described the following:

“The architect helped the community as well as the board understand the process and involved them up front. The architect spent time putting a committee together from the town to get their input and stressed the importance of early communications to the community. He listened to the concerns of everyone before beginning the design.”

(NOTE: this project was in a historic district and involved the entire community, not just the preschool staff.)

The second administrator/owner again had a very different response. The architect hired to design her center didn’t spend much time with her discussing the process, but instead:

“...handed me the contract to review. I think he expected that my husband (a general contractor) would explain anything to me that I didn’t understand.”

She expressed in the interview that there were many things she didn’t understand and had to work very hard throughout the design and construction process to “stay on top of things and make sure decisions weren’t made without me.”

The teachers unanimously expressed that the design professional did not spend any time with them at the beginning of the project or during the process. An important point to note, however, is that all three teachers were from the same preschool, so this response only reflects the actions of one design professional.

Finally, the interviewees were asked:

“How did that (the sharing or lack of sharing of information about the design process) affect your provision of appropriate information?”

Again, all of the child development interviewees agreed that having more information about the design process at the beginning of the project would help them provide better and more appropriate information. Timeliness was another issue identified by one of the administrator/owners, since she never knew what was coming next, she couldn’t make
decisions or prepare information ahead of time. She expressed the feeling that she was “living by the seat of her pants”, and that she was “a pain when she called to ask questions” about what she needed to be doing. One teacher shared that she had trouble visualizing and that meeting with the architect and having him explain what was happening would have helped her feel more familiar with the building and more comfortable sharing her thoughts. Another teacher felt that the architect would have been frustrated working with all of the teachers and hearing lots of different ideas. The same teacher also expressed her feelings that design professionals don’t understand the needs in preschools – that designers look at designing child care centers from a business point of view while teachers look at it from the children’s perspective. In support of this view, as expressed by another teacher, the administrator had to “fight” a lot to get what they needed. In other words, not only did the design professional have difficulty understanding the needs of the preschool, the child development professionals had difficulty explaining their needs in terms clear to both groups.

**Parents’ responses.** The parents were asked the same questions as the child development professionals and similar responses were received. In response to the question addressing the interviewee’s familiarity with the design process, two responded that they were familiar with the process prior to the preschool beginning the project, and two responded that they had no experience with the design process prior to the project. One of the two expressing familiarity was a professional architect specializing in design for the aged. The second person expressing familiarity with the process said she was introduced to it by her first husband who was an architecture student, and was also involved in an office renovation several years ago.

Because all of the interviews were conducted with parents from the same preschool, their responses to the second question were identical. When asked:

“*How much time did the design professional spend with you explaining the design process?*”,

all four said that the architect spent no time with them discussing the process or the project.

The third question:

“*How did that (the sharing or lack of sharing of information about the design process) affect your provision of appropriate information?*”,

received mixed responses from the parents. Two of the parents said that because of the efforts of the administrator/owner to involve the parents, not having contact with the design professional did not affect their input at all. One stated that she was very confident in the owner’s decision-making for the center, and the other echoed that sentiment and added that she felt clear about what was expected from her since the owner was in contact with them often.
The second two felt that by not having the design professional provide information about the design process, sharing appropriate information was more difficult. The parent/architect expressed her concern by saying:

“\text{When clients understand the process, they don’t get too detailed in the information they give too early on. There is a more appropriate exchange of information through each step of the project.}”

Overall, parents were not as involved in the design process as the teachers working in the center, nor were they as concerned about being involved in the decision-making. While half of the parents wanted to have an opportunity to express their needs, the other half put their faith in the administrator/owner to make appropriate decisions. As expressed by one parent, if the owner had not been as committed to the children and as involved in the process as she was, the parents might have had more concern about the decisions being made for the new center. As it was, they involved themselves as they desired, leaving the principle decisions to the administration and design team.

Summary. As the data suggests, a tool to support the education of both design and child development professionals is needed to improve the information gathered in the design process. While architects indicated the importance of educating their clients, the interviews indicated that in practice it is rarely done to the point of creating a comfort level in the child development professionals. Based on the interview responses, the center directors are often in the position of acting as a liaison between the design professional and their teachers and parents. To aid their communication efforts, child development professionals need greater support and education about expectations and needs of design professionals, as well as needing empowerment to stand firm for the rights and needs of children. Many of the child care providers interviewed expressed their frustration about the constant battles they felt they were fighting to simply get what they knew their children needed. As expressed in the interviews, communication leads to more successful projects, and fewer misunderstandings which can be energy draining and costly to change in the construction phase when they are identified and understood by the child care providers. By creating a tool that educates both the child development professional and the design professional, the two fields begin the project with a greater understanding of each other’s needs, thereby facilitating greater communication early in the process.
Format of the Tool

Interviews were used to determine the format of the educational tool. Findings from the interviews supported the initial findings from the focus group: preschools are not ready to implement such a computer-based tool at this time. Nor are design professionals ready to take advantage of the opportunities provided by computer-collected data. Findings that support this position are presented below.

Design professionals’ responses. Design professionals were asked to report the software programs typically used in conjunction with client work. The question asked:

“What computer programs do you typically use when presenting to a client and when designing?”

Two of the design professionals immediately identified AutoCAD (a computer drafting program) and a variety of three-dimensional modeling programs such as 3-D Studio and 3-D Studio Visual. They stated that these programs were typically used on larger projects, and the 3-D Studio products were used primarily for high-end clients. PowerPoint was identified by one design professional as a program sometimes used in marketing presentations for larger, high-end clients. One of these two design professionals also noted that she used Lotus or Excel spreadsheets for synopsizing programming data collected during client interviews.

One design professional stated that computers were only used as tools to visually communicate information he couldn’t communicate in any other way. Primarily he used computer support to produce floorplans, elevations, site plans, and memos. He felt that it was important to determine how to best connect with the client and to provide the client information in the most appropriate way for them personally. In his opinion, trying to communicate the design process through technology would not be successful, and that personal discussions about the process and the steps was important.

The fourth design professional did not use computers in any part of the client work. He emphatically stated:

“I don’t have access to computer drawing programs and I don’t want access to them. My jobs are usually light commercial, under 20,000 square feet with smaller budgets. I can communicate well with my clients without computers, and I don’t need them.”

He did, however, use the computer for administrative tasks such as billing, letters, and recordkeeping. All drawings for clients were done by hand, and based on his response to the question, no computers would be used for graphic communication within his office.
Child development professionals' responses. Child development professionals, including both teachers and administrators/owners, were asked three questions to determine their familiarity and use of computers. The questions included:

1. “What computer programs are available at your center?”,
2. “How accessible are they to the teachers and parents?”, and
3. “What is the familiarity level of teachers, administrators, and parents with these programs?”

The two administrators interviewed were both familiar with the computer programs available and offered such software packages as WordPerfect, Excel, QuickBooks, and Internet access. Both administrators used e-mail and the Internet in their jobs, but only one of the two expressed a high level of confidence in computer use on the whole.

One administrator, recognizing the lack of computer experience in her teachers, implemented a program that required each staff member to create the monthly newsletter for the center at least once. This was her attempt to increase her teachers’ computer use and experience, and hopefully encourage them to use computers in their classrooms more often. This administrator indicated that her teachers were mixed; some were very comfortable with the computer and some were scared of it. She has offered support in the form of workshops for her teachers, but participation has been limited. Both parents and teachers have access to the center’s computers if they wish, although the administrator indicated that many parents had computers at home and did not use the preschool computers.

The second administrator responded in much the same manner, although her efforts to engage the teachers in computer use were limited. She felt that the majority of her teachers were not particularly comfortable using the computers, but a computer was available to them whenever they wanted to learn. Computers were not easily accessible to parents in this center, although if a parent expressed an interest in using one of the center’s computers, the computer was made available. In her opinion parents, on the other hand, were more familiar with computers and used them extensively. Since many of the parents of children in her center had computers in their homes, the lack of availability of computers for parents was not seen as a problem.

Teachers addressing the same questions confirmed the administrators’ ideas about familiarity with and use of computers. Of the three teachers interviewed, none were familiar with the programs available, none had experience with the computer and expressed a lack of comfort in working with them, and each believed that parents had a greater experience level with computers than the teachers. One teacher said:
“We have computers in the center that are available to the children and the teachers whenever they want them, but not parents. I don’t know much about computers, but if I need to do something on the computer, there is always someone I can ask for help.”

**Parents’ responses.** Parental responses to the same interview questions as the child development professionals centered around computer use within the classroom, and a unanimous opinion of inadequacy was expressed. The parents responded by identifying which classrooms did not have computers for the children, yet it was acknowledged that computers were available for the teachers if they needed them. It was commonly expressed, however, that the teachers did not use the computers much, and parents felt that teachers did not know much about them. One parent expressed this concern:

“My perception is that teachers as a whole know very little about computers. They don’t seem to be getting information on computer use in college. I don’t really see a need for computers in the infant and toddler classes, but teachers of older children need to be more aware.”

Parents generally had a high level of experience and comfort with computers, and did not see a need to have access to computers at the preschool. This could be, as one parent observed, because many of the preschool parents interviewed work at a major university and use computers in their jobs daily. In general, parental awareness of computer use in the preschool was moderate, and mostly centered around knowledge of programs used in the classrooms. Parental use of computers was high, but access to computers at the preschool facility was not necessary, in their opinions.

**Summary.** The data collected regarding computer use clearly illustrated an insufficient comfort and experience level to produce a computer-based education tool at this time. Child development professionals are making progress in using computers in the preschool setting, but as the interviews showed, most teachers have little or no experience, and administrators typically have limited experience, using mostly word processing and preschool-centered administrative programs. Parents had a greater comfort level with computers than teachers, but as was pointed out in the interviews, this could be a result of the parents’ working requirements. Design professionals on the whole had a much greater comfort level with computers and used them in a variety of applications. The use, however, seemed to increase with the size and quality of the project, and rarely were smaller jobs given the benefit of PowerPoint marketing presentations or 3-D modeling presentations. No design professional expressed a use for computers in educating clients about any part of the design process, or for collecting additional information from the client beyond the programming interview. As a result of these data, any tool that is created for use in preschools should, at this time, be a paper-based tool. At a later
Content of the Tool

To determine the need for a tool, investigating the contrast in perceptions between design professionals, child development professionals, and parents regarding the adequacy of information shared about the design process was important. Since the differences in perceptions of understanding are reported in the previous data, the tool appears warranted. The contents of the tool, however, need to be informed by ideas from the design professionals, child development professionals, and parents interviewed.

Seven themes were discovered in the analysis of the interview data: (a) administrative issues, (b) interior design, (c) education, (d) uniqueness of the building type, (e) choosing a design professional, (f) contact between participating parties, and (g) communication skills needed (see Appendix J). Themes a, c, f, and g are the same themes identified in the focus group data. This reinforces the similarity of the responses between the two groups, illustrating a constancy in the thoughts and experiences between the participants.

The themes resulted from responses to two questions asked of the interviewees:

(a) What could be done to improve communication between design professionals, child development professionals, and parents when designing preschool spaces? and

(b) Is there anything else you would like to say or talk about that we haven’t touched on?

The second question was the final question in the interview and gave the participants an opportunity to express any thoughts they had not previously shared.

The following section discusses the findings of the interviews conducted, organized by the themes, identified throughout the interviews. While this format differs from the previous findings sections, the thematic organization is used to identify the common ideas offered by the interviewees as important to improving the communications between all parties in the design process.

**Administrative issues.** This theme was addressed by seven of the 13 interviewees. Specific topics such as budgets, schedules, and an understanding of the timeline of design and construction were discussed.

**Budgets** were brought up by several of the respondents and were the most prevalent topic in the administrative issues. The subjects most often discussed were a need for client awareness of the value of a construction dollar (i.e. what would the budget allowance really
purchase), and the effect of the budget on timing and professional services. One respondent said that there was a need to reduce the number of design professionals involved in a project to reduce the overall cost of the project, while another expressed a concern that often children’s needs are compromised as a result of necessary budget reductions. A concern was also raised in relation to the budgets of small centers; the budget problems were pushing child care into more of a “big business” trend. In other words, only companies with large budgets were able to construct and maintain facilities to care for children. These, however, concentrated on volume and economies of scale in child care, often compromising the care and attention the children received during the day. The need to deal with “budget realities” was identified in a variety of formats, including understanding the true design and construction possibilities for a given budget, obtaining the projected construction costs early in the design phases, and clarifying the effect of changes and additions on the initial budget.

Schedules for design and construction were another topic brought up by the participants. Several of the child development professionals expressed a lack of understanding of the timeframes for decisions and products. An administrator/owner, after expressing her frustration as a result of not knowing when she needed to provide information to the design professional said:

“Having a timeline at the beginning of the project would have been helpful. That way I would have understood how things would proceed and when I needed to make decisions and get information to the architect.”

One respondent talked about the lack of understanding regarding the permitting process necessary to design and construct a preschool center, and how this process can significantly affect the projected schedules. Actual construction schedules were also addressed, and a concern expressed about the need to communicate in real terms how long it would take to design the building, then how long it would take to actually construct that building. Unrealistic scheduling expectations on the part of clients were identified by design professionals as a problem.

Overall, budgets and schedules caused a great deal of concern for many of the interviewees. As two interviewees expressed, better communication about realistic expectations is necessary to help everyone on the team be aware of the progress of the project and the responsibilities of all involved.

Interior design. Seven of the 13 individuals interviewed responded with topics that fit into the interior design theme. Two subheadings under this theme were identified: (a) preschool design elements and (b) design approach. While many of the responses dealt
with actual features that needed to be considered when designing preschools, such as ensuring an exposure to nature and including daylight in the classrooms, several addressed concerns about the manner in which the interior design was handled. One administrator/owner stated:

“The interior piece wasn’t addressed sufficiently. We hadn’t formally planned to do anything with this (interior design). Really we hadn’t even considered it. I really needed support in making the decisions about the inside.”

Another offered the suggestion that centers should hire architects that are also interior designers so the job would be complete, but they wouldn’t have to pay for two different design professionals. A better understanding of the expertise of each profession would help child development professionals have more realistic expectations of design professionals.

Another issue regarding the interior design theme was the generation of ideas for the interior. One child development professional stated that it was important to determine the priorities for the children’s and center’s needs before talking to the design professional. Another interviewee echoed the same concerns, and suggested that clients look at examples of different types of children’s spaces (i.e. museums, play facilities) and collect pictures and examples of other centers or facilities that were attractive and functional. This could provide common illustrations to begin discussions between design and child development professionals about a center’s specific needs and desires.

**Education.** The topic of education, including the education of design professionals about child development issues, and the education of child development professionals about design issues, was of major concern to the interviewees. Each of the 13 people interviewed addressed this issue in some form when asked the two questions identified above. The education theme was divided into two primary subthemes: the education of design professionals about preschool/child care issues and the education of child development professionals about design issues. Within these two subthemes, other subheadings appeared and are discussed below.

The responses dealing with the **education of the design professionals about preschool/child care issues** divided into three subheadings including (a) design professionals spending time in centers, (b) specialization and experience, and (c) communication. Five of the respondents felt that it was important for the design professional to spend time in the center prior to designing a new space. The respondents stated that this was the only way for the design professional to become familiar with the daily workings of a center and the needs of that particular center. Having the designer interact with the children in the classroom, work with teachers as they progress through their day, follow administrators as they carry on the business
of the centers, and observe parents as they bring and pick up their would provide a more realistic understanding of the requirements of the center as a part of the programming process.

Six of the interviewees expressed a need for designers to have prior experience designing children’s facilities before being hired to design a preschool space. They all recognized that a design professional has to begin with a “first job”, but all felt that by having prior experience, the educational process would be smoother and the job more successful. One teacher said that prior experience would also reduce the costs since the design professional would not have to spend as much time learning about the needs of children. In addition to previous experience, three of these respondents expressed a desire for design professionals to specialize in children’s spaces to help them understand the many needs and requirements and to keep current in children’s design issues to further reduce the need for education about children’s and teachers’ needs. As expressed by a respondent, this specialization would alleviate the need for teachers and administrators to have to “fight” for the needs of children since the design professional would have a clear understanding of the reasoning behind the requests. Awareness of the requirements of preschool spaces was also an advantage of specialization or prior experience identified by the respondents. The requirements identified went beyond the needs of children and incorporated technical requirements, maintenance and operation requirements, and functional requirements. Knowledge of licensing expectations was also identified. Including individuals familiar with the requirements above in the programming process is another way to educate the design professional in these topics, as indicated by interview responses.

Finally, communication issues surfaced as the third subheading under this theme. The primary point discussed under this subheading was the need for open communication between all parties involved, and the need to create common links and languages between the members of the team. The child development professional was recognized as having a responsibility to clearly communicate with the design professional about the needs of the children, and to educate the design professional about the necessity of providing for those needs. Design professionals spoke of their own communication responsibilities in asking questions about the needs of the center and continuing to seek clarification of issues until everyone was in agreement about the direction of the project. Based on the responses, each party understood that they were responsible for a piece of the success of the project. Bringing these pieces together to create a successful center, however, is the challenge each design team faces.

**Educating the child development professional about the design process** was also divided into three subheadings; (a) programming, (b) communication, and (c) activities. The
primary subheading discussed by seven of the interviewees was programming, or the importance of early information-gathering in the design process. Design professionals discussed the importance of child development professionals understanding what programming entailed, and how the information shared in this step was critical to the future design phases. One design professional expressed the following concern:

“We need to educate people about the importance of programming. The industry trend seems to be moving toward clients thinking that programming is an unnecessary expense. Clients don’t understand why they need to spend time programming, but the process suffers when programming isn’t done thoroughly and well. Then the client has to pay for redesigns.”

The child development professionals and parents also expressed concern about learning their responsibilities in the programming process. Respondents expressed a desire to provide information, but often were not aware of ways to share ideas with the design professional. Some respondents identified the need to include all of the parties involved in the programming process, as discussed in the section on educating the design professional. Both child development professionals and parents shared ideas for methods of providing input to the design professional in the early stages of the design. When the value of their input was acknowledged, the child development professionals and parents had a desire to be involved in the design process. By having the design professional educate them as to the most effective methods by which to share their ideas, a broader base of information would be available to the designer.

As in the section on educating the design professional expresses, communication was also seen as an important subheading under educating the child development professional. Open communication between the participants, and explanations by the design professional of the designs as well as the process were identified as critical. Eight of the interviewees discussed communication as an important factor in educating the child development professionals and parents during the design process. One designer even offered a suggestion:

“What we need is a simple, straight-forward book on how to communicate with architects. It could talk about what a typical architect asks…”

Interestingly, not all interviewees expressed positive experiences with the educational process. One design professional, talking about his experiences designing a preschool said that he didn’t talk to the teachers about their needs although he did tour the existing facility on two occasions. He also did not feel a need to include the parents in any of the communications about the new center since he didn’t feel that the parents were users of the space. Educating his “client” was
limited solely to the contact he had with the owner. Another respondent expressed frustration at
the lack of information shared by her design professional:

“People build buildings every day, this is nothing new. Design professionals need to help clients understand what is going on.”

Parents also expressed a desire to be included in the educational process, and wanted to understand the needs in order to provide more input and suggestions in an appropriate manner to aid in the design of new spaces. Clearly these responses reflect a desire on the part of child development professionals and parents to understand the process, and it is the responsibility of the design professional to assure that that understanding is clear.

To aid in the communication and education process, nine of the interviewees offered suggestions for activities, the final subheading, that would foster a better understanding of the design process and a greater sharing of ideas. The suggestions ranged from touring existing facilities, to creating periodic handouts discussing updates and progress, to computer-interactive exercises to share information, to conducting hands-on workshops for parents, teachers, administrators and children. One interviewee shared her experience in a hands-on workshop conducted by an architect well known for initiating interactive workshops to involve participants in the design. She said that he used non-traditional materials like Cheerios and recycled materials to let people represent their ideas in ways that were expressive to them. This helped everybody understand what was going on and feel like they had contributed to the new space. The interviewee felt that this would be a good way to get input for a preschool design, and a possible method of involving the children in the design process. Given the variety and quantity of suggestions for educational activities, the respondents saw interactive, hands-on activities as a prime method of imparting information to the individuals involved in the design process.

The education of each team member about the design process and the needs of the preschool facility were seen by the interviewees as an important issue. This was illustrated by the fact that every person interviewed made some reference to this topic, and many had suggestions for providing better education for everyone involved.

**Uniqueness of the building type.** The preschool building was identified as a unique building type by five of the interviewees, and as such needs particular considerations in the design process. This theme was addressed in issues such as building codes and zoning issues, Americans with Disabilities Act (ADA) considerations for children, and the special nature of designing for children.
One respondent shared his opinion that preschools don’t have a “model” in architecture, planning, or zoning considerations. In other words, there are few precedents that guide the planning or design decisions for children’s facilities. This was not an expression of a need for “prototypes” for child care facilities, only an observation that the building type is not defined from an architectural perspective. Another participant stated that architects need to understand that designing preschool and child care facilities is a separate specialty and that designers need to be competent about children’s needs. The participants recognized that licensing rules, building codes, and health/safety requirements exist, but do not have qualitative factors associated with them to help designers use the codes appropriately in children’s spaces. Finally, one design professional shared concerns about the availability and interpretation of accessibility requirements for children. He had encountered problems regarding the interpretation of the ADA for children’s toilet facilities when designing a preschool, and found very little support from building officials on the matter.

Identifying a building type, defining codes, licensing rules, accessibility issues in light of children, and recognizing the unique nature of children’s facilities were the primary topics of this theme. As expressed by one design professional, in addressing these issues during the design process, we develop a better understanding of the design requirements of preschool and child care buildings.

Choosing a design professional. Six of the interviewees saw actions and characteristics of design professionals as important factors in the design process. While only two specifically discussed the choice of design professionals, all six talked about qualifications and attributes design professionals needed or had that could contribute to a more successful design project. One interviewee stated that the design professional:

“…needed to listen, get input, set up meetings, and take the responsibility to lead the process of communication and get everybody involved.”

Two others expressed a need for design professionals to have prior experience designing children’s spaces, and that they should also have knowledge of interior design. One design professional shared her view that child development professionals needed to understand how to choose appropriate design professionals, and what questions to ask in the process. She expressed the need for administrators to ask about capabilities, prior experience, references, and previous projects. Clients should also evaluate their rapport and comfort level with the design professional. Finally, one administrator/owner said that the design professionals needed to stay somewhat connected to the project throughout, and shared her experience of having the architect “fade in the process” once the design of the building was complete. Understanding
how to choose appropriate design professionals for specific projects is important, and is recognized by many of the interviewees as discussed in this section.

**Contact between participants.** This theme was identified initially in the responses from the focus group and observed again in the interview data. Of the 13 interviewees, all voiced a response that was seen as a part of this theme. Upon analysis of interview responses, the same subheadings identified in the focus group data were evident, and included (a) types of contact, (b) identifying participants involved, and (c) intercenter contact and coordination.

**Types of contact necessary** for improving communication revolved around regular communication with the design and construction team in the form of meetings, conference calls, and joint activities. One interviewee stated that the team needed to “set up a regular venue for communication” while another felt that the project needed “more meetings of the professionals involved to keep everyone together on times and deadlines”. Experiences shared by interviewees indicated that in some cases regular project meetings were not being held, and that the quality of the project suffered as a result.

Meetings and conference calls were not the only methods of collectively communicating about the project offered in the interviews. Participating in joint activities, such as touring centers as a group and engaging in hands-on activities in workshop type settings, were also seen as potentially helpful in building better relationships and improving cooperative efforts. One interviewee shared a technique he had successfully used in the past. He toured different child care facilities with his clients taking pictures, obtaining copies of floorplans, and conducting joint discussions with the center directors. At the completion of the tours, he held a design charrette where all of the involved parties brought their ideas together and collaboratively designed a center reflecting their needs and desires. This provided a “starting point” for many discussions and greater partnership throughout the design process. Another design professional expressed her thoughts that regular contact between the parties fostered a “cross-pollination of ideas” that led to more appropriate design solutions.

Finally, some interviewees offered suggestions for less personal contacts that would still provide parties with needed information. In the programming activities, some teachers and parents shared thoughts about completing questionnaires and surveys as a way to provide design professionals with more information without having to personally contact a great number of people. Two other participants also suggested that a periodic newsletter be produced to update everyone on the progress of the project, or a log be kept in the preschool that gave regular updates about the job. These were methods that allowed participants to stay informed with a minimum of time required on any one individual.
Another finding within this theme was the **identification of the individuals considered “participants”** in the design process. Interviewees generally expressed the desire to have parents, teachers, maintenance/operations personnel, and administrators/owners be involved in the early design activities, and felt that they were participants in the overall process. While not all design professionals acknowledge the parents as users of the space as indicated in an earlier example, the predominant view among child development professionals and parents was that they along with teachers and administrators should be included in the idea-generating activities. Interestingly, only one interviewee identified children within the group of participants. One other design professional did recognize that children may be considered “participants” but felt:

“…I could ask the children, but I don’t know what useable information I would derive from them.”

**Inter-center communications** was also a subheading within this theme. Keeping all individuals within the center informed of the project’s progress was an important aspect of successful communication, and while some of the examples provided earlier in this section illustrate methods of keeping center personnel informed, other activities were identified to generate ideas and participation from these individuals prior to becoming involved with the design professional. One administrator suggested that the center needed to get their ideas together and be clear about their intended direction before hiring a design professional. This required that the community within the center conduct meetings and activities to create their own consensus, then they could present those ideas to the design professional for feedback. Ongoing feedback from parents, teachers, and operations personnel about plans, decisions, and approaches by providing copies of plans and sketches and requesting suggestions was also identified as critical in maintaining contact with all participants throughout the process.

Overall, open communication and regular contact with all individuals identified as participants in the process was seen as a vital factor in the success of any project. The suggestions given for accomplishing this level of interaction supports the perception of importance held by the interviewees.

**Communication skills.** Communication skills needed for successful collaborative efforts were the final theme identified during the interviews. While not unanimously addressed, 10 of the 13 individuals interviewed stated some form of concern about communication skills when asked about improving interactions between the design professionals, child development professionals, and parents during the design process. Although this theme was correspondingly identified in the focus group, different subheadings were identified in the data. The subheadings
from the interviews included (a) use of different communication media, (b) clarity of communication, and (c) responsibilities of involved parties.

Seven of the 10 responses about communication skills centered around the use of different media to convey messages. Three respondents identified the use of pictures to help people visualize ideas and communicate concepts not easily conveyed with words. Two others identified communications through the use of computers as beneficial, including Internet usage and website communication for updates on design and construction progress. Other respondents offered ideas of hands-on workshops, job logs and newsletters for updates, frequent meetings, and telephone and teleconference communication. In other words, the responses in this subheading recognized that there were various options to support better communication, and successful projects depend on the exploration and use of the most appropriate methods to keep all participants in touch throughout the process.

Clarity in communications was a central topic throughout this theme. The interviewees recognized the need for clear communication to ensure the consideration of various ideas and needs, and as one person observed:

“Communication is a two-way street. Both partners (child development and design professionals) must be good communicators”.

This sentiment was echoed by several of the participants. One shared a concern that child development professionals often can’t say what they really want or like, so it is up to the design professional to ask lots of questions. Another interviewee expressed her frustration at having to constantly justify the needs of the center to the design professionals. She felt that the design professional wasn’t recognizing the importance of the features she was identifying as critical to the center’s success. This feeling was repeated by another child development professional who said that she felt she had to expend extra effort because she had to justify to the design professional everything she was requesting. A different participant talked about the importance of building a trusting and comfortable relationship between the design and child development professional to foster more open communication. With a better relationship, all individuals would feel more at ease to ask questions to explain points not clearly articulated.

The final subheading identified under this topic was the responsibilities of involved parties in the communication efforts. One design professional was quite clear that it was the design professional’s responsibility to lead the process of communication. She saw the design professional as the individual charged with setting meetings, leading discussions, assuring that everyone involved understood the process, and providing activities to gain input and insight from any individual involved in the preschool center. Respondents saw child development
professionals as having the responsibility to provide appropriate information to the design professional, and to communicate with the center personnel to involve them in the process set up by the design professional. Beyond the active process of setting meetings and involving staff, one respondent also identified two very critical elements in the communication process for which everyone has responsibility. He stated that listening to what the group is saying with an open mind is extremely important to the process, as well as being careful of hidden agendas and ego-driven decisions. Realistically, he felt that egos can enter into a process such as design, and that being aware of this possibility and openly communicating about the dangers of egos and hidden agendas can help to alleviate some of the problem.

Everyone interviewed agreed that open, clear communication was a very important aspect of a successful design project. Each participant must understand and perform their responsibilities and seek a variety of methods of gathering and sharing information that allows everyone an opportunity to contribute ideas, insights, and suggestions to the design process.

Summary. The content of the communication tool was determined by the responses to the question addressing methods of improving communication between design professionals, child development professionals, and parents in the design process. Seven themes were seen in the data analysis, and several themes were complex enough to warrant subheadings within the theme. The themes ranged from administrative issues to communication issues, and included other topics such as education, interior design, uniqueness of the preschool facility, choice of the design professional. Ideas shared by the interviewees were often from their personal circumstances, and illustrations of their experiences provided a greater understanding of the needs of design team members.

There was a great deal of similarity between the responses received during the interviews and the responses generated to the same question in the focus group. This similarity aided in the determination of the topics to be addressed in the communication/education tool created.

Communication Tool

The data collected during the focus group and interviews were analyzed and organized into a book to be used as an communication/education tool for anyone involved in the design process of a preschool facility (see Appendix K). The sections of the book were based on the topics identified by the participants as important for consideration in improving the communication between the child development professionals, design professionals, and parents when designing the preschool spaces. Some of the sections were collapsed to provide better
continuity, and some were renamed to avoid confusion for the reader. Sections based on the identified topics included (a) uniqueness of the preschool facility, (b) choosing a design professional, (c) collaborative learning, (d) administrative issues, (e) project participants interactions, and (f) references to aid the project team (see Appendix J).

Feedback about the content and format of the book from the three groups participating was a final key step in this research. The book was sent to all focus group and interview participants, as well as six additional individuals to gather their comments. As discussed in the Methodology chapter, a questionnaire accompanied the books (see Appendix D), and the responses to the questions posed were evaluated and reported below.

Questionnaire

The questionnaire elicited information primarily about three topics: (a) format, (b) content and clarity, and (c) potential use (see Appendix D). One additional issue was addressed in the questionnaire sent to the previous participants; their opinions about whether the document reflected their input. Of the 23 packets sent out for final data collection, 16 were returned, for a total response rate of 62%. One of the respondents, however, returned the packet with unanswered questions and stated that a death in her family made her participation impossible at the time. The usable questionnaires totaled 15. Reviewers often had similar sentiments reflected in their responses, and those responses, organized by the questions, are discussed in the following sections.

Question Responses

Question 1. The first question posed to the participants requested information about the overall format of the book. The question read:

“What are your opinions about the format of the booklet (including size, structure, page layout, and overall ‘look’ of the work)?”.

All 15 responses were positive, seeing the work as well done and appropriate. The participants included specific comments on elements such as the font, margins, “look”, and organization. Five responses specifically mentioned their approval of the wide margins for notes and overall page layout. Four respondents felt that the work was “reader-friendly” and two others saw it as “looking professional”. Three individuals mentioned their approval of the organization, however, another offered a suggestion to:

“…structure the booklet to more closely follow the structure and chronology of the design process.”.
Other suggestions were offered for more detailed improvements of the work, although the persons offering the suggestions also made comments about their positive feelings about the overall work. One suggestion was to remove the chapter identification pages, since they seemed to that participant to unnecessarily lengthen the book. Four respondents felt that more illustrations and graphics should be added since the nature of design is such a visual process. Another suggestion was to consider reducing the overall size of the book, although one participant identified using a “partial” page on 8 ½” x 11” paper as “interesting”. Finally, one respondent stated that “your name is nowhere on the book!”. Each of these responses reflected a positive response to the format of the book, and the suggestions given were provided in the spirit of improving the work.

**Question 2.** The second question on the questionnaire was only asked to the participants who had previously been involved in either the focus group or the interviews. It was intended to determine their thoughts about the inclusion of their own views in the document and asked:

“At this document reflect in some way the views you expressed in your interview or focus group?”

Of the nine responses received to this question, all nine stated that they could see their ideas and views had been expressed in the tool.

**Question 3.** The next question addressed the ease of understanding the booklet and was stated:

“Was the wording clear? What areas in the booklet need additional clarification?”

Of the 15 responses to this question, 12 specifically stated that the wording was clear and easily understood. No negative responses were given, but several suggestions for clarification were offered.

One respondent provided “word edits” throughout the document to increase understanding and improve the flow of the information. In addition, a suggestion was made to include more information on creating mission statements and philosophies for centers, and a request was made for additional clarification on the chapter dealing with the uniqueness of preschool centers. Another respondent identified a format issue that she felt would help her to more easily follow provided information: in a table on pages 14 and 15, format the table to span one page, rather than two. She also felt the variety of information ranging from broad concepts to details included in the table made it “a bit difficult to absorb”. Some of the respondents related their own personal experiences to the steps suggested in the book, although no
narrative was included to identify which experience was preferable. Responses were not clear as to whether the book was interpreted as incorrect, or as a good guide that would have positively affected the respondents’ experiences. Finally, one respondent who stated that the book was clear and responsive to any participant in the design process expressed her feelings about the need to include children by saying that:

“The wording wasn’t clear to a major “end user”, the children! But that’s a whole new document, isn’t it?”.

Question 4. The fourth question addressed the use of the book, and asked the participants:

“**How would you anticipate using the document?**”.

Two of the participants did not answer this question, but of the remaining responses from design professionals, child development professionals, and parents, all identified methods of applying the document within their professions. Several of the statements centered around the use of the document as a tool to familiarize clients/preschool teams with the design process, such as:

“I could envision simply giving a copy to them (clients) at the beginning of the project and then reviewing it all after they have read it.”

“I see sharing this with my staff as well as offering it to my supervisors to read. Also, I would make notes from it to have when interviewing potential design professionals.”

“As an interior designer, this document would serve as an excellent primer at the start/onset of the design project. I would make a copy available to every person to be involved before our very first meeting and ask them to bring it with questions/comments to our initial discussion.”

Use of the book as a marketing tool was also identified by two design professionals, as well as a workshop and reference tool. One child development professor felt that she would use it as a reference source in her Early Childhood Administration course. Overall, many different uses for the document were seen by the participants to educate individuals in the preschool design process.

Questions 5 & 6. The next two questions looked at the need to expand or delete information within sections of the document and were worded as follows:

**Question 5 – “What sections, if any, within the tool should be addressed in more detail?”** and
**Question 6 – “What sections, if any, within the tool should be deleted or information reduced?”**.

These questions sparked many useful suggestions, although some responses seemed to contradict others. For example, one person identified the Project Participants Interactions
chapter as important and needing more detail, while another respondent felt that the chapter was too long and should be shortened.

Eight of the respondents stated specifically that nothing should be deleted or reduced in any area of the document. Another response identified a need to shorten the Uniqueness of Preschools chapter, while one respondent felt that there was redundancy throughout the book that needed to be dealt with. While in other questions the activities were praised, one participant felt that the timeline exercise in the Administrative chapter was not particularly useful in her opinion. One child development professional offered a correction in the section addressing the NAEYC validation/licensing of child care centers. She stated:

“There is no uniform, consistent NAECP (NOT NAEYC) validator that could be held responsible for an NAECP “opinion about the design of a center”. NAECP accepts facilities, as long as they meet state licensing standards, and validates how they are adapted for current programs.”

One design professional expressed a concern about the “tone” of the book, and felt that the definition of an architect was not a true representation of the architects’ skills and services. He stated that the book seemed to be written from an “interior design” point of view, and said:

“….it should be written in such a way that the reader cannot detect the profession of the author.”.

Another architect expressed a differing view, however, when he observed:

“I also see examples of very forthright comments by child care and design professionals coming through. The outcome is obviously clear that you have balanced the views of all parties.”

Overall, the responses indicated that the work is balanced and provided information needed by the entire design team involved in the preschool design process.

While half of the respondents stated that nothing needed to be deleted or reduced within the document, all but three of the respondents had suggestions to offer about sections to be addressed in more detail. Two of these suggestions entailed adding completely new sections, and the remainder of the suggestions addressed additional information in specific sections.

The issue of accessibility was identified by three respondents as an additional section. While no details were suggested, the responses indicated that the readers felt that the issue warranted specific treatment. The second suggestion was to include the services of engineers, contractors, and child care consultants in the chapter identifying design professionals. This suggestion was made by three of the respondents who had experience in the design process and felt that these three individuals were vital to the success of the design.
Although one respondent felt that the timeline was unnecessary, others felt that it should be expanded to include time for fundraising as well as time to adequately address the creation of the mission statement and philosophy. Adding more detail about decision-making and the involvement of clients in various phases of the design process was also seen as a needed expansion of the document. Including examples of some of the design documentation, contracts, and programming questionnaires was suggested by one respondent. Discussions on more efficient use of the preschool facility’s square footage, the critical nature of providing appropriate (as opposed to adequate) space for the children, and the bid process prior to construction were mentioned as information important for inclusion by two participants. Finally, expansion of the references/resources for the reader by adding information on funding opportunities, current research on children’s environments, and pertinent Internet addresses were cited by several as additional resources for the readers.

Question 7. While similar in content to Question 4, Question 7 is intended to determine whether the participants would use this document in their own work. The question asked:

“Is this a document you would use when considering a renovation of your existing facility or a new preschool facility?”

Of the 15 questionnaires returned, one did not answer this question, one stated that he might use the document if more graphics were included, and the remaining 13 responses were emphatically positive. Assertions such as “absolutely!”, “definitely”, and “yes!” were found throughout the responses. Some sentiments were more elaborate:

“I wish this document had been available to me three years ago when our process began. I think that I would have been able to better plan for this process.” and

“This is a terrific tool for the small center especially.”

Based on the answers to this question, all but one of the respondents were explicit in their reactions about their own personal use of the tool in the design process.

Question 8. Responses to the final question, “Please share any other thoughts you had while reading through the tool that might help to improve the content or appearance of the work”, typically fit into the categories addressed by previous questions. Answers and suggestions offered in this question were included in the responses of previous questions that specifically addressed that issue. For example, one respondent shared that the addition of icons or graphics would be helpful to the overall look of the document. This response was reflected in the write-up for Question 3.
Summary

The questionnaire accompanying the education/communication tool gathered information from 15 participants about their reaction to the book. Format, content, and potential use of the book were the primary topics spoken to in the questions, and responses were overwhelmingly positive. The format was seen as appropriate, the content seen as relevant, and the potential uses of the book were varied. Many valid suggestions were provided to expand the content, and other recommendations made to improve the overall look and organization of the work.

Summary

The results reported in this chapter were derived from analysis of data from three different collection methods: the focus group; personal interviews with 13 representatives of the child development profession, the design profession, and parents of preschool children; and a questionnaire. All provided qualitative data regarding the communication between the identified parties in the process of preschool design.

The focus group provided general information about the problem identified and included representatives from each group. All had experience in creating new preschool facilities, and during the focus group shared many of their experiences. They identified elements necessary in the preschool facility to support both the children and the adult population within a center. In addition, they provided insight into communication and education problems they encountered while engaged in the design process. These problems included a lack of understanding of the expectations and responsibilities of team members, difficulty in explaining needs and requirements to design professionals, and lack of communication skills leading to more effective sharing of information among the individuals involved. The data provided a general look at the problems, and identified a need to probe more deeply into experiences of individuals involved in the preschool design process. This disclosure led to the next phase of data collection, the individual interviews.

The 13 interviews that comprised the second phase of data collection investigated the experiences of these participants in the preschool design process and explored their suggestions for improving these experiences. Responses were focused in three areas: the need for a tool to aid in the communication/education process, the format of the tool, and the content necessary for the tool to be useful. Data collected clearly supported the need for a tool to assist in creating a more collaborative team effort while designing preschool facilities. Data also identified the need for the tool to be paper-based to enable the broadest user access. Based on the responses about familiarity and access to computer programs, introduction of any
type of computer-based tool was seen as premature at this time. Finally, the contents needed for an effective tool were identified and organized into seven themes. The themes included (a) administrative issues, (b) interior design, (c) education, (d) uniqueness of the building type, (e) choosing a design professional, (f) contact between participating parties, and (g) communication skills needed. Each theme dealt with specific issues identified by the participants, and detailed information was gathered to more thoroughly review each subject.

Using the themes from the data analysis, a book was written as a tool for use in the design process. The information provided by the interviewees was used as a basis to compose and detail the tool. Data was consolidated and reorganized in a logical fashion, and then compiled into seven chapters that included not only narrative about each subject, but also activities and exercises to help the reader more clearly understand the topic being discussed.

To evaluate the book upon its completion, a copy was sent to each participant with a questionnaire to obtain feedback about the tool. Questions centered around the format of the booklet, the relevance of the content, and the application and use of the tool. The overall response to the book was positive, with the majority of the respondents agreeing that the format was commendable, the content was relevant, and the applications were broad within the narrowness of the subject matter. Many suggestions were provided for improving the content by expanding particular sections and adding some new subjects. Format suggestions mainly focused on adding more illustrations and graphics, and the uses participants saw for the tool ranged from educating the design team to providing a resource for an Early Childhood Administration class.

The results described in this chapter show a logical progression through data collection methods to create and evaluate a tool to aid in the preschool design process. Each step was carefully constructed to obtain the type of information most appropriate for the research phase and the collection method. Altogether the methods provided an appropriate multi-method approach for the creation and evaluation of an education/communication tool.
Chapter 5
Conclusions and Discussion

Overview of the Research

The purpose of this research study was to improve communications between design professionals, child development professionals, and parents in the preschool design process. To facilitate this purpose, the need for a support tool to aid in improving communication between the identified groups was explored, the participants’ perceptions about the format and content of such a tool was investigated, and reactions to a support tool created based on participants’ responses were gathered.

Preschool as a context for development was a primary consideration in this research study. Bronfenbrenner’s Model of the Ecology of Human Development provided an appropriate model to illustrate the importance of the microsystem in the development of children, and clearly positions the physical context as a critical determinant of development. Gardner’s Theory of Multiple Intelligences identified eight intelligences within each individual that are affected in part by exposure to particular contexts or environments during development. From the Multiple Intelligences theory we see the potential impact of the preschool environment on the intelligences recognized by Gardner. Based on Bronfenbrenner’s model and Gardner’s theory, the interior environment was seen as a critical physical context affecting children’s development. As a crucial context for children, the preschool environment must be designed and built as appropriately as possible to support the children who spend time within the space. To design an appropriate preschool facility, collaboration between design professionals and all users of the space is paramount; and clear, open communication is the best method for sharing ideas, thoughts, and needs. Supporting collaboration was the main focus of this research, and the methods of accomplishing this task are discussed below.

Three questions guided the research:

1. Is a tool or support document needed to help educate and foster communication between child development professionals, parents, and design professionals in the early phases of designing a preschool facility?
2. What are the format and content issues that need to be addressed and included in developing such a tool?
3. How would child development professionals, design professionals, and parents comment on the usefulness of an educational/communication tool?

Data were gathered to respond to the research questions using a multi-method approach which included conducting a focus group, 13 individual interviews, and 26 mailed
questionnaires at various stages of the project. The focus group was held during a week long class at Harvard and Tufts Universities focused on designing child care facilities. The group included 7 participants; child development professionals, design professionals, and parents; who had an interest in the appropriate design of children’s spaces. The focus group provided a foundation of general information with which to proceed to the next method, the individual interviews.

Thirteen interviews were conducted with child development and design professionals, as well as parents of children attending preschools involved in the design process. The interviews delved into more detail about participants’ opinions and perceptions of their design experiences. Responses from the interviews provided more detailed information about the need, content, and format of the communication tool.

Using the data collected in the focus group and individual interviews, a communication tool was written. This tool was a book to be used as an educational as well as communication tool for all individuals involved in designing a new or renovated preschool facility. The book included narrative information about the process, suggestions about such issues as choosing design professionals and determining the overall essence of the center, and activities to help familiarize the participants with steps they might encounter during the preschool design.

To evaluate the appropriateness and usability of the tool, a packet including a cover letter, the tool, and a questionnaire was sent to all focus group participants, all interviewees, and six additional professionals involved in preschool design. The questionnaire was structured to provide participants an opportunity to voice their opinions about the tool, and to give suggestions for improvement. The responses were positive and expressed the appropriateness of the tool and the desire of the respondents to use the tool in a variety of settings. Suggestions were made for improvement, and while several recommendations were made for additions, the respondents did not feel that anything should be removed from the tool as it was written. Overall, the participants stated the need for such a communication tool, the suitability of both format and content, and their desire to use the tool in the design process.

Discussion

Need for the Tool

The primary justification of need for the communication tool came from responses to questions dealing with the amount of time design professionals spend educating their clients about the design process, how familiar child development professionals and parents are with this process, and how understanding the design process affects the provision of appropriate
information. Other supporting data were gathered from focus group and interview questions dealing with communication issues and other areas of concern identified by the interview participants.

Architects expressed the importance of discussing the design process with their clients in the interviews. In practice, however, the architects indicated that they approached the explanations primarily from the standpoint of reviewing the American Institute of Architects (AIA) Contract and discussing the scope of services and deliverables of the project. While this information is helpful, it is not complete enough to foster a comfort level in the clients about their responsibilities and expectations during the design process.

Defining the “client” was also a topic of discussion, and many architects ignored some primary users of preschool spaces. In all four interviews with the architects, no teachers or parents had been involved in the communication/programming process of their child care designs, nor had the process been explained to them. This situation may have happened for a number of reasons, including the belief that the director was acting as a liaison between the teachers, parents, and the design professional, or, as in many cases with new centers, teachers had not been hired at the time of design. In only one case out of all 13 interviews were teachers and parents involved in the design process. The responses from design professionals interviewed indicate a realization of the importance of educating clients about the design process, but a practice of conducting minimal, often inadequate sessions with clients to explain the process.

Experiences shared by child development professionals and parents seem to support the previous finding about education of clients by design professionals. One director indicated that the architect hired spent a considerable amount of time educating everyone involved in the project about the process, the expectations, and the product. She expressed that this education and understanding led to a smooth running and successful project. Another center director shared that her architect only briefly reviewed the AIA contract (scope of services) with her and as a result, she felt that she didn’t understand the process, timeframes, or expectations. These sentiments were echoed strongly in the focus group, where center directors expressed varying degrees of feeling inferior to design professionals, feeling as though they didn’t know anything and needed to defer to the design professionals, and feeling that they were constantly fighting battles to have their centers set up for children as opposed to having centers focus on architectural attributes at the expense of the children. No parents or teachers interviewed had been contacted by the architect to solicit input into their preschool’s design. It is important to note, however, that all parents and teachers were from the same preschool, so this only reflects
the action of one design professional in one project. Although the exclusion of parents and teachers from design meetings reflects only one architect, the information gathered from other design professionals seems to support this approach as more of the norm than the exception.

Collaboration between teachers, parents, and children is an important theme in child development as illustrated in Bronfenbrenner’s research (Bronfenbrenner, 1986), and is equally important when designing preschool spaces. The partnership of these groups with the design professional provides a greater opportunity to gather pertinent information with which to design appropriate preschool spaces for children, parents, and teachers. While results of this study do not show that this collaboration is taking place, they do indicate that the participants recognize the importance of working together in the design process, and are willing to explore tools that would aid in collaboration.

During both the interview process and the focus group, unsolicited suggestions were presented regarding the need to empower the child development professionals and improve the information gathered during the design process. In the focus group, having the design process information early was identified as very important to help the child development professionals feel more competent. One designer in the focus group suggested that a binder was needed that included the important things to deal with in the design process. The need for a support document was reiterated by an architect in an interview where she offers a suggestion for a “simple, straight-forward book on how to communicate with architects”, to help child development professionals feel more comfortable with the design process.

As the data suggested, a tool to support the education of both design and child development professionals is needed to improve the information gathered in the design process. While architects indicated the importance of educating their clients, the interviews showed that in practice adequate educational sessions are rarely conducted to the point of creating a comfort level in the child development professionals. Child development professionals wanted to communicate clearly with the design professional and had a desire to understand the design process, but were not aware of the resources available to inform them about the process. The tool created acts as a bridge to facilitate better communication in the early stages of the design project creating a stronger foundation for the team to share information and learn from each other, ultimately leading to a more appropriately designed preschool.
Format and Content of the Tool

The initial intent of this research was to create an interactive computer-based tool that would lead the design professionals, child care providers, and parents into more meaningful communication about the process of designing preschool centers. During the focus group and the subsequent individual interviews, responses showed that the possibility of effective use of a computer-based tool at this time is minimal. Not that the tool itself was unnecessary, but that the access and comfort level of the individuals involved in the research indicated that the preschools are not ready to support a computer-based tool, nor are the design professionals fully ready to take advantage of the educational and programming opportunities.

Two questions were asked during the focus group to determine the programs used in the centers and the comfort levels of the staff in using these tools. Program availability was varied, with most having some type of word processing program and some type of program to help them keep track of administrative issues. No one identified any type of presentation software such as PowerPoint, or any other programs that involved the staff collecting information or interacting with programs. Only two individuals indicated that they had e-mail access, and no one identified access to the Internet within their centers.

Individual interviews with child care center directors and teachers supported these initial findings. The two center directors indicated that they personally had a moderate to moderately high comfort level with the computer, but that for the most part, their staff had a much lower comfort level and familiarity level with computer use. Internet access was identified as available by both administrator/owners, but usage was minimal. Interestingly, in the interviews with teachers, every teacher indicated their personal comfort level with computers was very low, and some said that they had no interest in learning to use computers.

Parents interviewed, on the other hand, had a high level of comfort and familiarity with computers, but that may be attributed, as one parent indicated, to the fact that many work in a university setting and are required to use computers every day. There was speculation by one parent that many parents of preschoolers today would probably have a considerably lower level of experience or knowledge than the parents interviewed.

Most design professionals had experience with word processing programs, spreadsheet programs, and graphic programs such as AutoCAD, and much of their presentation work was done with sketches, models, and PowerPoint (for high end customers). No indication was given that programming information was collected using any type of computer technology, and only one design professional indicated the use of spreadsheet programs to synopsize programming information.
Given the varied responses about computer use, familiarity, and availability, I realized that creating a computer-based tool as a support resource for the preschool design process was a premature. As a result, I changed my original idea about the format of this tool and created a paper-based tool as a resource to support the individuals involved in the design of preschool spaces.

The content areas of the communication tool primarily came from responses to a question regarding improving communication when designing preschools. This question was asked in the focus group and in each interview. At the end of each interview, an additional question was asked to give the respondents an opportunity to offer any topics or ideas they had not previously discussed. The responses, while varied and filled with personal examples, reflected seven primary themes. These theme topics are:

1. Administrative issues (including budget, timing, schedules),
2. Interior design (including the need for interior designers and interior space issues),
3. Education (including education of design professionals about child development and education of child development professionals about design)
4. Uniqueness of the building type (including building issues, ADA, building type/model)
5. Choosing a design professional
6. Contact between all parties involved, and
7. Communication skills needed for a successful project.

The topics were recurring themes throughout the focus group and the individual interviews, and provided a guideline of the issues identified by participants as important. As a result, the content of the communication tool was structured around these seven themes. Information from the interviews falling within each of these themes guided the creation of narrative, exercises, information, questions, and activities to aid design professionals, child development professionals, and parents in communicating more effectively in the early phases of the design process.

As the data reviewed in the “Need for the Tool” section suggests, clear communication in the early part of the project forms the foundation upon which the project is built. By addressing these seven issues and educating the project participants about the design process they will engage in, all individuals involved in the preschool design project should begin with a greater understanding of their roles and responsibilities. Gardner indicated that addressing the needs of individual children is critical to their development (Gardner, 1993). To design preschool spaces that accommodate the variety of needs encountered, a wide range of input from different individuals is imperative. Therefore, providing an understanding the process and supporting
collaboration using a tool has the potential to ultimately produce a more child-oriented, creative, innovative, and less costly space.

Participants’ Comments on the Tool

Responses to the questionnaire about the communication tool were positive and indicated a desire on the part of design professionals and child development professionals to use the tool in future design projects. Format of the tool was seen as appropriate with some of the respondents commenting positively about the space provided to write notes in the margins. Graphics were seen as a needed addition, as well as a section addressing accessibility, and the inclusion of additional professions in the sections describing project participants. No topics were seen by the respondents as unnecessary, and many saw varying uses for the tool in their professional work. Respondents also indicated that they saw their focus group and interview responses reflected throughout the work. Overall, the tool was regarded as a success, and provided a needed addition to the preschool design process.

Conclusions

From the beginning of this study I asserted that my research was focused on gathering data about communication issues around designing preschool facilities. My intention was to create a computer-based tool to help in the programming process (information-gathering phase) of the preschool design. I approached this problem with a fundamental assumption that design professionals, child development professionals, and parents were communicating, but more effective communication using an information-gathering tool would lead to better designs within preschools. As I entered into the data gathering phase of my research with my first focus group, I found a very different situation. The responses I received from the participants indicated that the communication between design professionals and child care professionals was less than I had expected, and that the use of computers within the preschools at this time is minimal. The issues of design and child care professionals speaking different languages, child care professionals feeling intimidated by design professionals, and the need for child care professionals to "fight" for what they needed in their centers were identified quickly in the focus group. While my original intention was to use several focus groups to collect data on my topic, I realized as a result of the findings of the first focus group that I needed to talk with participants on a more individual basis and refocused the data collection to use individual interviews. The interviews provided more detailed data upon which I based decisions about the need, format, and content of the communication tool I developed.
The results of this study clearly illustrated the need for a support tool to aid in the communication and education of both design and child development professionals in the preschool design process. The format of the tool, while originally intended to be computer-based, was shown to be more useful at this time in a paper-based format. Content of such a tool, as shown in the data, must include such topics as collaborative learning among design team participants, suggestions for choosing design professionals, administrative issues, interactions among project participants, and an overview of the uniqueness of the preschool facility from a design standpoint.

The primary focus of the research was on the interior spaces of preschools, however, the tool does address some broader topics dealing with exterior preschool issues. The tool is structured to show the responsibilities of both the client/building task force as well as the design professionals. As indicated by some of the feedback responses, though, the tool needs to be reorganized to more clearly indicate the activities of the client group prior to the design professional becoming involved in the project. The client group needs to make decisions about the scope of work to be performed, the budget, and the overall expectations of the design professionals. The design professionals then can help the client interpret their needs and philosophy and create spatial solutions based on their requirements.

The findings of this study are clearly linked to the theoretical framework identified to guide the work. Both Bronfenbrenner and Gardner indicated the importance of context in the development of children. This is repeatedly illustrated in the responses throughout the data collection as participants offer suggestions for improving the environment for the children served. Results also support Bronfenbrenner's belief that collaboration is critical, and administrators, teachers, and parents want to not only be included in the design process, but also to be kept informed of the progress of the project. Gardner, in offering the Multiple Intelligences theory, shows that providing experiences for developing all 8 intelligences is a critical consideration for growing children. Responses to this study also support this theory, as child development professionals, design professionals, and parents all seek to provide children a variety of experiences during their preschool time. Participants' responses about the format of the tool also reflect a support for Gardner's theory. Questionnaire responses suggest more visual components, additional sections on the needs of children with different challenges, and expansion of some "hands-on" activities are needed in the tool to increase its effectiveness. In addition to addressing different intelligences, Gardner also implies that development must begin at the current level of the individual and progress from that point. The research reflects this belief, as is illustrated in the revision of the tool format from computer-based to paper-based.
By supporting the preschool design team at their current level of technical expertise, greater opportunities should present themselves in the future for scaffolding their expertise and intelligence to a higher level of technology use.

Bronfenbrenner is not the only individual embracing the importance of collaboration. The well-respected schools of Reggio Emilia are based on a strong partnership between parents, teachers, children, and the community. To design creative, appropriate, and wonderful spaces for preschools in the American culture, we must adopt the same attitude of partnership between the child development professionals, design professionals, parents, and children. By following the example of a preschool system recognized by child development professionals around the world as a premier system, we can begin to provide spaces for our children that help them develop in the best way possible. Unfortunately, responses found that while partnership in the design process was seen as a factor in the success of designs, fostering and incorporating true partnership between all of the participants in the design process was not being pursued.

Throughout the responses child development professionals appeared to feel an inadequacy when communicating with design professionals, and needed a greater understanding of the design process to more fully engage in the planning and decision-making process. Preschool center administrators/owners were often called upon to explain the process to teachers and parents, and without satisfactory preparation and understanding of the stages necessary to accomplish the project, they felt inadequate to provide appropriate information. Design professionals also seemed to recognize the need to educate their clients to enable them to provide more appropriate information, however few of them spent sufficient time with the client to assure a full understanding of the upcoming activities. The discrepancies of perceptions between design and child development professionals about spending sufficient time together to assure a full understanding was the foremost reason to create a support communication tool.

**Limitations**

Three primary limitations had an effect on this study. The first limitation was that the data collection did not include children. I strongly believe that children should be included in the design process for their spaces. The original intent of this study was to create a text-based computer tool to support the design process that could later be modified to include children in the design process. As the qualitative nature of the study evolved, the format of the tool changed from a computer-based tool to a written workbook. Some of the exercises created for the workbook do invite children to participate, but the decision was made to complete the existing study with only adult input and recommend that any follow-up research should move to
the next step and include children's input. The workbook created can be easily modified at a later date to involve children more fully in the process.

The second limitation was that all teachers and parents interviewed were from the same preschool. As a result, each had similar experiences with the design professional involved in designing the new facility, and the experiences reflected the actions of only one architect. While the teachers and parents had many good opinions and suggestions for the tool, future research should consider eliciting participation of parents and teachers from different schools to gather a wider range of representative experiences.

The final limitation of this qualitative research project is that I, as the researcher, was the data-gathering instrument. While many researchers may not see this as a limitation, it must be acknowledged that the researcher as data-gathering instrument has an effect on the research. This effect is not negative, only an effect that should be recognized as a valid part of the study. As a result of the intimate involvement of the researcher in the data-gathering, it is impossible to have completely unbiased data. I have, however, taken precautions in my data-gathering to remain as neutral as possible, and did not impose my personal opinions or goals on the research participants. I had a second researcher taking notes during the focus group, and in our debriefing session we found agreement in the notes we took. In listening to the audio tapes made during the interviews, I specifically listened for any leading statements, and found no statements made, and very few verbal reactions that could have led the participant in a specific direction.

**Major Contributions of the Study**

The primary contribution of this study was to provide a tool to support the preschool design process by educating the participants about the process, helping the participants to understand their responsibilities, and empowering them to honestly and assertively express the needs and requirements for an appropriate preschool center. The data provided a basis for developing a tool as a result of responses indicating the need for support in the design process. Design professionals should pay attention to the responses of clients as shown in the data, and recognize a need to educate the client more thoroughly, involve the client more equally, and communicate with the client more effectively. According to the clients, these actions on the part of the design professionals will foster a more balanced atmosphere for sharing information, and ultimately a more successful project.

Other contributions are based on the links seen between the theory and results of the study. Collaboration, in the context of designing the preschool environment, is shown to be an important component in providing appropriate spaces for children. Through the literature
reviewed and the responses of the participants, the neglect of children's learning environments becomes evident. Good design benefits children. Research has shown the effect of interior environments on children, and many child development professionals understand that greater awareness about the unique nature of children's environments will lead to more appropriately designed spaces. Therefore, the physical environment is another factor to examine when determining the quality of care and education of children.

**Recommendations for Future Research**

There are countless recommendations for future research regarding preschool environments for children. As a relatively new research focus, there are many opportunities to discover how children interact in different types of space, what spaces are more conducive for particular activities, and how adult spatial responses affect children's spatial responses in the preschool setting. Based on this research, however, there are four main recommendations I offer for prospective research projects.

The first recommendation is to expand the existing research project to include children. Children could be involved in the data collection, and the tool could be structured to gather input from children for use in the design of spaces. Their involvement would provide even richer input for the design professional to use in the final design of the facility.

A second recommendation for future studies would include providing more comprehensive suggestions for translating center philosophies into spatial attributes. It is important for centers to have a clear understanding of their philosophies about children, and for those philosophies to be reflected in the interior and exterior environments. I am not suggesting that prototypes of child care centers be created for each child development theory, but that examples of environmental responses to particular ideas about children be created. These examples could then be used as a starting point for conversations between both design and child development professionals about spatial solutions for preschool facilities.

Exploring the success of preschool design projects with and without the support of the communication tool would also be another recommendation. Use in real design settings would provide additional data about content of the tool, and the need and success of using such a support document in the design process.

Finally, the communication tool could be converted to a computer-based support instrument when the preschools are more comfortable including computer technology into their educational process. Interactive computer education is gaining momentum, and the product
that resulted from this study would be a good candidate for conversion into a computer format in the near future.
References


Wieder, S., & Greenspan, S. I. The emotional basis of learning. *Child development and early education*.


APPENDIX A

Pilot Focus Group Questions
PILOT FOCUS GROUP QUESTIONS

1. What are five important interior features specifically for children that should be included in the design of preschool spaces?

2. What are five important interior features specifically for adults that should be included in the design of preschool spaces?

3. What types of computer programs do you use in your centers? What is the level of use and comfort by teachers and parents within the center?
APPENDIX B
Focus Group Questions
FOCUS GROUP QUESTIONS

1. What are three important interior features specifically for children that should be included in the design of preschool spaces?

2. What are three important interior features specifically for adults that should be included in the design of preschool spaces?

3. What could be done to improve communication between design professionals, child development professionals, and parents when designing preschool spaces?

4. What types of computer programs do you use in your centers? What is the level of use and comfort by teachers and parents within the center?
INTERVIEW QUESTIONS – CHILD CARE PROFESSIONALS AND PARENTS

1. Demographics - In what category do you fall (indicate all that apply).
   parent, teacher, administrator, architect, interior designer, other (please specify)
   Geographic area
   Years in position

2. Have you been involved in the design of a new or renovated center (or any other children’s space)? If so, when?

3. (a) How has your center chosen design professionals for previous jobs? (b) What criteria have been used?

4. (a) How familiar were you with the design process when you began the job? (b) How much time did the design professional spend with you explaining the process? (c) How did that affect your provision of appropriate information?

5. What are some important interior features specifically for children that should be included in the design of preschool spaces?

6. What are some important interior features specifically for adults (including parents, teachers, administrators, and others) that should be included in the design of preschool spaces?

7. What could be done to improve communication between design professionals, child development professionals, and parents when designing preschool spaces?

8. (a) What computer programs are available at your center? (b) How accessible are they to the teachers and parents? (c) What is the familiarity level of teachers, administrators, and parents with these programs?

9. Is there anything else you would like to say or talk about that we haven’t touched on?
INTERVIEW QUESTIONS – DESIGN PROFESSIONALS

1. Demographics - In what category do you fall (indicate all that apply).
   parent, teacher, administrator, architect, interior designer, other (please specify)
   Geographic location:
   Years practicing:

2. Have you been involved in the design of a new or renovated center (or any other children’s space)? If so, when?

3. (a) What criteria were used in choosing you as the design professional on children’s spaces? (b) How were you informed about the jobs coming up? (c) Did you have to prepare any type of presentation to the center before they hired you?

4. (a) How much time do you spend familiarizing clients with the design process? (b) Who is usually involved in this familiarization process? (c) How does that affect their provision of appropriate information?

5. What are some important interior features specifically for children that should be included in the design of preschool spaces?

6. What are some important interior features specifically for adults (including parents, teachers, administrators, and others) that should be included in the design of preschool spaces?

7. What could be done to improve communication between design professionals, child development professionals, and parents when designing preschool spaces?

8. What computer programs do you typically use when presenting to a client and when creating designs?

9. Is there anything else you would like to say or talk about that we haven’t touched on?
APPENDIX D

Questionnaires
CHILD DEVELOPMENT PROFESSIONALS QUESTIONNAIRE

DIRECTIONS
Please read the booklet enclosed in this packet and answer the following questions about different aspects of the tool. Please offer as much feedback as you are comfortable contributing, and feel free to write on the back of each sheet. Thank you for your assistance with this work.

1. What are your opinions about the format of the booklet (including size, structure, page layout, and overall “look” of the work)?

2. Does this document reflect in some way the views you expressed in your interview or focus group?

3. Was the wording clear? What areas in the booklet need additional clarification?

4. How would you anticipate using the document?

5. What sections, if any, within the tool should be addressed in more detail?

6. What sections, if any, within the tool should be deleted or information reduced?

7. Is this a document you would use when considering a renovation of your existing facility or a new preschool facility?

8. Please share any other thoughts you had while reading through the tool that might help to improve the content or appearance of the work.
DESIGN PROFESSIONALS
QUESTIONNAIRE

DIRECTIONS
Please read the booklet enclosed in this packet and answer the following questions about different aspects of the tool. Please offer as much feedback as you are comfortable contributing, and feel free to write on the back of each sheet. Thank you for your assistance with this work.

1. What are your opinions about the format of the booklet (including size, structure, page layout, and overall “look” of the work)?

2. Does this document reflect in some way the views you expressed in your interview or focus group?

3. Was the wording clear? What areas in the booklet need additional clarification?

4. How would you anticipate using the document to help your clients?

5. What sections, if any, within the tool should be addressed in more detail?

6. What sections, if any, within the tool should be deleted or information reduced?

7. Is this a document that would help you educate your clients that are considering a renovation of their existing facility or a new preschool facility?

8. Please share any other thoughts you had while reading through the tool that might help to improve the content or appearance of the work.
QUESTIONNAIRE
NEW PARTICIPANTS

DIRECTIONS
Please read the booklet enclosed in this packet and answer the following questions about different aspects of the tool. Please offer as much feedback as you are comfortable contributing, and feel free to write on the back of each sheet. Thank you for your assistance with this work.

1. What are your opinions about the format of the booklet (including size, structure, page layout, and overall “look” of the work)?

2. Was the wording clear? What areas in the booklet need additional clarification?

3. How would you anticipate using the document?

4. What sections, if any, within the tool should be addressed in more detail?

5. What sections, if any, within the tool should be deleted or information reduced?

6. Is this a document that would be useful when considering a renovation of your existing facility or a new preschool facility?

7. Please share any other thoughts you had while reading through the tool that might help to improve the content or appearance of the work.
APPENDIX E
Questionnaire Cover Letter
Dear Participant,

Thank you for agreeing to participate in this research study. I am a doctoral candidate in Child Development working with Dr. Andy Stremmel at Virginia Tech, and am in the final stages of my data collection. My research is focused on designing children's spaces (specifically preschool facilities).

During this past summer, I conducted one focus group and 13 interviews with design professionals, child development professionals, and parents to discuss communication and other issues about designing preschool facilities. After the focus group and interviews were completed, I used the data collected to compile the enclosed workbook. It is a tool primarily for child care professionals who are interested in renovating their existing facility or designing a new preschool. The tool should also be of help to design professionals in helping to educate their clients about design in general, and more specifically about children's spaces. Now I need feedback as to how effective this tool would be.

I would appreciate it if you could complete the questionnaire and return the booklet and questionnaire by December 11, 1998. If something comes up to prevent you from participating, please answer the one question at the end of this letter and return the entire packet to me as soon as possible.

The research should be complete sometime in March, and at that time, if you are interested, I will send you a copy of the booklet and the research overview. I have enclosed a form for you to sign to indicate your interest, along with a consent form that explains the research expectations. I've attached notes to each to explain what you need to do with them – mainly just sign and return.

Thank you so much for your help and participation in this project. I believe this work has the potential to help many people, and its success depends on input from professionals like you.

Thanks again,

Cindy Beacham
I am unable to participate in this portion of the research project for the following reasons (please check all that apply):

- Document too long to read
- Not enough time provided to read booklet and answer questions
- Not interested in participating at this time
- Timing of the request is bad
- Document too difficult to read (format)
- Changed jobs and am no longer involved in this area
- Too many questions to answer
- Questions not worded clearly
- Other (please specify)
APPENDIX F
Follow-up Post Card
Dear Research Participant,

Hello! Hopefully your holiday season is going well and you are having time to enjoy the season as it approaches. I wanted to send a quick note to say thank you to those of you who have returned the packet I sent, and to ask those you who haven't had an opportunity to complete the questionnaire to please answer the questions and return the packet as soon as you can. If you did not receive the packet or if it was misplaced, please e-mail me at odyssey1@vt.edu and I will mail you another one. Again, I appreciate your help with this project.
APPENDIX G
IRB Approval Request
Title of Project: Development of a Communication Tool to Aid in the Interior Design Process in Preschool Settings

Investigators: Dr. Andrew J. Stremmel, Cindy V. Beacham

I) The Purpose of this Research

a) The general purpose of this study is to provide a tool to foster communication among design professionals (including interior designers and architects), child development professionals (including teachers, administrators, and specialists), and parents of preschool children within the design process when designing preschool spaces. This will be accomplished in two stages: the first will determine attitudes of these groups about topical and format issues that should be considered when designing a computer-based communication tool to support the information gathering process when designing spaces; and the second will include creating and pilot testing a prototype communication tool for future use in the design and child development fields. Human subjects are necessary for this research since it is important for them to provide information about the format and content issues to be included in the tool. They have the professional and personal expertise to guide the development of the tool for clarity and usability.

b) The combination of the groups of individuals previously identified (i.e. design professionals, child development professionals, and families) can create a powerful design team when designing spaces for children because they possess much of the information needed to create appropriate, interesting spaces, but communication is central to the success of any team. Previously, I conducted a study to determine the spatial characteristics identified by design and child development professionals to be included in a design guideline for preschool spaces. I found that both design and child development professionals had similar ideas about spatial characteristics that should be included in preschool settings, but often differed in the degree to which they believed specific characteristics were important. As a result, the study recommended the creation and use of communication tools to enhance communication between individuals involved in the design process. To date, no viable tool is available to guide both design professionals as well as those individuals involved in obtaining information critical for developmentally appropriate spaces for children in that setting. This research will address this lack of support for the people involved in the design process.

II) Procedures

a) The types of data needed for my proposed study are varied and necessitate a variety of expertise within the sample groups. Qualitative research methods will predominate because of the need for in-depth information, opinions, and
suggestions about the creation of the software tool. The focus group format will allow me to interact with a larger number of design and child development professionals as well as parents while still allowing me to probe for more information and a deeper understanding of their ideas and concerns. Information gathered in this format will enable me to design and create a tool that is more responsive to the needs and desires of the professionals who will use it in the future.

b) The focus groups will be conducted with parents of preschool aged children, child development professionals associated with preschools, and design professionals whose primary responsibility is designing facilities for children. A total of four focus groups will be conducted to gather information from design and child development professionals and parents concerning the development of the content and format of the tool, the potential use, and the elements to be included within the tool to foster communication.

i) One focus group will be conducted with a combination of participants including representatives from all three groups targeted. The sample will be chosen from the individuals attending a week-long session on creating environments for children at the Child Care Design Institute in Cambridge, Massachusetts, and will include design professionals, child development professionals, and parents within the same group. It is difficult to anticipate the attendance at this time, but the preliminary plans is to ask for volunteers from among the participants during the first session, divide the volunteers into groups based on the professions listed, and randomly choose individuals from each group. They will be notified at the following session and the focus group will be conducted the following day.

ii) Another focus group will be conducted with design professionals and will include both interior designers and architects responsible for designing environments for children. The participants in this group will be chosen from the employees of a design firm that specializes in the design of children’s environments. This firm will be identified through suggestions from the participants in the Child Care Design Institute and the Director of the Institute.

iii) A third focus group will be conducted with child development professionals associated with preschools, and will include teachers, administrators, and specialists. To collect data from these individuals, NAEYC accredited preschool facilities and university lab schools will be polled to determine facilities that have recently undergone redesign of their existing facility or the design of a new facility. Using the list of facilities indicating that they have recently been involved in the design process, one center will be chosen and teachers and administrators will be invited to participate.

iv) Finally, a parent group will be asked to participate in a focus group, and those parents will be randomly chosen from the rolls of the 3-year old and 4-year old classes at the University Child Development Lab at Virginia Tech. By conducting focus groups with these four samples, each target sample group is represented twice within the study.

c) Each of the focus groups will follow a standard procedure and will address 2 – 4 open-ended, pertinent questions about spatial needs in preschool facilities. Some of the information these questions will address include familiarity and comfort with computer use, ideas about spatial features for preschool spaces, and teaching
needs. Sample questions are attached. For each group, a minimum of 5 participants and a maximum of 10 participants will be needed, necessitating the invitation of 15 – 20 individuals to participate. These individuals will be typically be contacted with personalized letters of invitation and/or phone calls, and follow-up letters to remind them of dates, times, and places. Written notes will be taken on responses during the focus group session. An audio recording will be made of the focus groups to allow for future clarification of information if necessary. No videotaping of the sessions will take place.

d) A questionnaire will be a part of the pilot test of the computer tool once completed. The participants will be volunteers from the parents, teachers and administrators of the Virginia Tech Child Development Lab and interior design professors and students from the Department of Near Environments, Virginia Tech. They will be asked to “walk through” the new program and give feedback on their experience. The questionnaires will be anonymous and will be conducted on the computer as part of the initial program. Possible questions are attached.

III) **Risks**

a) There are no inherent risks to any participant in this research.

IV) **Benefits of this Project**

a) This research will provide a tool to enhance communication between design professionals, child development professionals and parents during the process of designing new preschool facilities. With more information geared to the specific needs of the preschools being designed, more appropriate spaces can be created for all users of the space.

V) **Extent of Anonymity and Confidentiality**

a) An audio tape of each focus group will be made for the purposes of future clarification of the information gathered. Notes will be taken during each session, but the tapes will allow for more in-depth information-gathering. The tapes will be held in a secure file cabinet until the research is complete, then all tapes will be thoroughly erased. No indication of any participant’s identity will be made on the audio tapes.

b) Information gathered within the focus groups will not be associated with any individual. Records of participants invited to participate will be destroyed at the completion of the study. The only records of participants will be their signed consent forms and written requests for copies of the research study if they wish to obtain copies.

c) The questionnaires used as the evaluation tool for the computer program will be completely anonymous. They will be completed within the computer program as the participants complete the evaluation exercise. No identifying components will be included within the survey.

VI) **Compensation**

a) Individuals participating in this study will have access to the final research report and will be given a copy of the computer-based tool if they wish to have a copy.

VII) **Informed Consent**

a) Form attached

VIII) **Biographical Sketches**

a) Biographical sketches attached
Proposed Focus Group Questions

1. What are 3 important interior features specifically for children that should be included in the design of preschool spaces?
2. What are 3 important interior features specifically for adults (including parents, teachers, administrators, and others) that should be included in the design of preschool spaces?
3. What features would increase your comfort level when working with a computer program?
4. What type of organizational structure would be most beneficial when grouping data collected from parents and child care professionals about preschool spaces? (For design professionals only)

Potential Questions for Questionnaire

1. Did you understand the purpose of the tool?
2. Was the tool engaging (did you enjoy working with it)?
3. Did the tool help you to think about the preschool space in ways different than you might have without using it?
4. Was the organization of the tool clear?
5. Were the questions in the tool clear?
6. Did you have any difficulty using the computer? If so, what types of problems did you encounter?
7. How did you feel when working through the program?
8. Are there areas of information that were not addressed in the tool that you feel should be included?
9. Is the organization of the output clear? What suggestions do you have that would make it more useable? (For design professionals only)
10. Demographic information
    - Parent, child development professional, design professional, other (please specify) - check all that apply
    - Age
    - Number of children, ages
    - Gender
    - Years involved in preschool settings
    - Involvement in renovation of existing preschool or design of new preschool in the past 5 years?
APPENDIX H
Informed Consent Forms
Title of Project: Improving Communications Between Design Professionals, Teachers, Administrators, and Parents When Designing New Preschool Spaces and Renovating Existing Preschool Spaces

Investigators: Cindy V. Beacham, Researcher, Andrew J. Stremmel, Ph.D.

I) The Purpose of this Research
   a) You are invited to participate in this study which is looking at improving communication between architects, interior designers, teachers, administrators, and parents when designing new preschools or renovating existing spaces. We will attempt to discover what issues are important when designing preschool spaces, and how that information can be communicated to all individuals involved in the process using a focused discussion group. This group will include from 5 – 10 people involved in children’s spaces.

II) Procedures
   a) In your focussed discussion group, you will be asked to answer 2 – 4 pertinent questions about the topic. Our agenda will be as follows:
      i) Introduction of leaders and group participants
      ii) Reading and signing of consent forms
      iii) Fill out forms indicating desire to have copy of study sent to you
      iv) Answer question #1 on index cards
      v) Cards organized, grouped, and collected
      vi) Answer question #2 on index cards
      vii) Cards organized, grouped, and collected
      viii) Discuss question #1
      ix) Discuss question #2
      x) Overall discussion on question #3
      xi) Discussion on Question #4 if feasible
      xii) Wrap-up and final comments
   b) This session should last from 1-1/2 hours to 2 hours maximum. An audio recording will be made of the session for later reference and clarification of discussion points. No identification of individual participants will be made from the tape, and tapes will be erased at the end of the research project.

III) Risks
   a) The questions you will answer are not expected to cause you any risk or discomfort.

IV) Benefits of this Project
   a) By participating in this research, you are contributing to a greater understanding of children’s spaces and how to improve communication between designers, parents, and child development professionals. With more information geared to the specific needs of the preschools being designed, more appropriate spaces can be created for all users of the space. These appropriately designed spaces
support children on a national level, and give parents and teachers one more area in which to improve the lives of children.

V) Extent of Anonymity and Confidentiality
a) An audio tape of this focus group will be made for the purposes of future clarification of the information gathered. Notes will be taken during this session, but tapes will be used to clarify any questions that may arise about the discussions taking place. The tapes will be held in a secure file cabinet in my home until the research is complete, then all tapes will be thoroughly erased. No indication of your identity will be made on the audio tapes.
b) Information gathered within the focus groups will not be associated with you in any way. Records of participants invited to participate will be destroyed at the completion of the study. The only records of participants will be their signed consent forms and written requests for copies of the research study if they wish to obtain copies. These records will also be kept in a secure file cabinet with the audio tapes.

VI) Compensation
a) You will have access to the final research report and will be given a copy of the communication tool developed from the information if you wish to have a copy.

VII) Freedom to Withdraw
a) You are free to withdraw from this study at any time. Withdrawal will not preclude access to the final research report or to a copy of the computer-based tool created as a product of the research.

VIII) Approval of Research
a) This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Human Development.

IX) Subject’s Responsibilities
a) As a participant, I voluntarily agree to participate in this study. I have the following responsibilities:
   i) To attend the scheduled focus group
   ii) To offer ideas and opinions as requested during the group meeting

X) Subject’s Permission
a) I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project.
b) If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

__________________________________________  __________________________
Signature                                           Date

Should I have any questions about this research or its conduct, I may contact:

Cindy Beacham, Research Director              (540) 552-1142 or
e-mail: <odyssey1@vt.edu>
Andrew Stremmel, Research Advisor             (540) 231-4671
H. Thomas Hurd, IRB Research Division         (540) 231-5281
Title of Project: Improving Communications Between Design Professionals, Teachers, Administrators, and Parents When Designing New Preschool Spaces and Renovating Existing Preschool Spaces

Investigators: Cindy V. Beacham, Researcher, Andrew J. Stremmel, Ph.D.

I) The Purpose of this Research
   a) You are invited to participate in this study which is looking at improving communication between architects, interior designers, teachers, administrators, and parents when designing new preschools or renovating existing spaces. We will attempt to discover what issues are important when designing preschool spaces, and how that information can be communicated to all individuals involved in the process using individual interviews of professionals in each of the target groups identified above.

II) Procedures
   a) In your interview, you will be asked to answer 7 - 8 pertinent questions about the topic. Our agenda will be as follows:
      i) Introduction of interviewer and explanation of the process
      ii) Reading and signing of consent forms
      iii) Fill out forms indicating desire to have copy of study sent to you
      iv) Answer questions #1 - #8 with discussion on each to the extent you feel comfortable
      v) Wrap-up and final comments
   b) This session should last from 1/2 hour to 1 hour maximum. An audio recording will be made of the session for later reference and clarification of discussion points. No identification of individual participants will be made from the tape during the data analysis, and tapes will be erased at the end of the research project.

III) Risks
   a) The questions you will answer are not expected to cause you any risk or discomfort.

IV) Benefits of this Project
   a) By participating in this research, you are contributing to a greater understanding of children’s spaces and how to improve communication between designers, parents, and child development professionals. With more information geared to the specific needs of the preschools being designed, more appropriate spaces can be created for all users of the space. These appropriately designed spaces support children on a national level, and give parents and teachers one more area in which to improve the lives of children.

V) Extent of Anonymity and Confidentiality
   a) An audio tape of this interview will be made for the purposes of future clarification of the information gathered. Notes will be taken during this session, but tapes
will be used to clarify any questions that may arise about the discussions taking place. The tapes will be held in a secure file cabinet in my home until the research is complete, then all tapes will be thoroughly erased.

b) Information gathered during the interview will not be associated with you in any way in the data analysis and final writing of the resulting documents. Records of participants invited to participate will be destroyed at the completion of the study. The only records of participants will be their signed consent forms and written requests for copies of the research study if they wish to obtain copies. These records will also be kept in a secure file cabinet with the audio tapes.

VI) **Compensation**

a) You will have access to the final research report and will be given a copy of the communication tool developed from the information if you wish to have a copy.

VII) **Freedom to Withdraw**

a) You are free to withdraw from this study at any time. Withdrawal will not preclude access to the final research report or to a copy of the computer-based tool created as a product of the research.

VIII) **Approval of Research**

a) This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Human Development.

IX) **Subject’s Responsibilities**

a) As a participant, I voluntarily agree to participate in this study. I have the following responsibilities:

   i) To attend the scheduled interview
   ii) To offer ideas and opinions as requested during the interview process

X) **Subject’s Permission**

a) I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project.

b) If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

_________________________  ____________________
Signature                  Date

Should I have any questions about this research or its conduct, I may contact:

Cindy Beacham, Research Director (540) 552-1142 or e-mail: <odyssey1@vt.edu>
Andrew Stremlmel, Research Advisor (540) 231-4671
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   a) You are invited to participate in this study which is looking at improving communication between architects, interior designers, teachers, administrators, and parents when designing new preschools or renovating existing spaces. We will attempt to discover what issues are important when designing preschool spaces, and how that information can be communicated to all individuals involved in the process using individual interviews of professionals in each of the target groups identified above.

II) Procedures
   a) In completing your questionnaire, you will be asked to answer 7 pertinent questions about the topic. The agenda will be as follows:
      i) Read introduction letter
      ii) Read and sign consent forms
      iii) Read booklet entitled “The Design and Creation of Preschool Spaces: A Primer for Child Care Professionals”
      iv) Answer questions #1 - #7 with discussion on each to the extent you feel comfortable
      v) Return packet to researcher
   b) This process should last from 1 to 2 hours depending on the detail of your responses. No identification of individual participants will be made from the questionnaires, only an indication of child care professional or design professional.

III) Risks
   a) The questions you will answer are not expected to cause you any risk or discomfort.

IV) Benefits of this Project
   a) By participating in this research, you are contributing to a greater understanding of children’s spaces and how to improve communication between designers, parents, and child development professionals. With more information geared to the specific needs of the preschools being designed, more appropriate spaces can be created for all users of the space. These appropriately designed spaces support children on a national level, and give parents and teachers one more area in which to improve the lives of children.

V) Extent of Anonymity and Confidentiality
   a) The questionnaires returned will be held in a secure file cabinet in my home until the research is complete, then all records will be destroyed.
b) Information gathered through the questionnaire will not be associated with you in any way in the data analysis and final writing of the resulting documents. Records of participants invited to participate will be destroyed at the completion of the study. The only records of participants will be their signed consent forms and written requests for copies of the research study if they wish to obtain copies. These records will also be kept in a secure file cabinet.

VI) **Compensation**

a) You will have access to the final research report and will be given a copy of the communication tool developed from the information if you wish to have a copy.

VII) **Freedom to Withdraw**

a) You are free to withdraw from this study at any time. Withdrawal will not preclude access to the final research report or to a copy of the tool created as a product of the research.

VIII) **Approval of Research**

a) This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Human Development.

IX) **Subject’s Responsibilities**

a) As a participant, I voluntarily agree to participate in this study. I have the following responsibilities:
   i) To read the document for review
   ii) To respond to the questions about the document read

X) **Subject’s Permission**

a) I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project.

b) If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

_____________________________   ______________________________
Signature                         Date

Should I have any questions about this research or its conduct, I may contact:

Cindy Beacham, Research Director (540) 552-1142 or e-mail: <odyssey1@vt.edu>
Andrew Stremmel, Research Advisor (540) 231-4671
H. Thomas Hurd, IRB Research Division (540) 231-5281
APPENDIX I

Focus Group Themes
Focus Group Dominant Themes and Coding Categories

100 Education
101 Education of design professionals about child development issues
102 Education of child development professionals about design issues

200 Administrative Issues
203 Timeframes and schedules
204 Budgets and funding
205 Inter-center issues (i.e. articulating vision, mission, etc.)

300 – Communication Skills
306 Types of communication necessary
307 Responsibilities and roles of participants
308 Collaboration and teamwork
309 “Language” differences between design professionals and child development professionals
310 Using different media

400 – Contact Between Participants
411 Types of contact
412 Identifying participants involved
413 Inter-center communication
APPENDIX J

Interview Themes for Tool Content
Interview Dominant Themes and Coding Categories

100 Administrative Issues
101 Budgets
102 Schedules and timelines

200 Interior Design
203 Preschool design elements
204 Design approach

300 Education
305 Education of the design professional about child development
   305a Design professionals spending time in centers
   305b Specialization and experience
   305c Communication
306 Education of the child development professional about design
   306a Programming
   306b Communication
   306c Activities

400 Uniqueness of Building Type
407 Building codes and zoning
408 Accessibility
409 Special nature of designing for children

500 Choosing a Design Professional
510 Qualifications
511 Attributes

600 Contact Between Participants
612 Types of contact
613 Identifying participants involved
614 Inter-center contact and coordination

700 Communication Skills
715 Use of different media
716 Clarity of communication
717 Responsibilities of involved parties
APPENDIX K
Communication Tool
Communication tool in separate file.

See Tool.pdf
CINDY V. BEACHAM

**Home:** 313 Owens St. P-1
Blacksburg, Virginia  24060
(540) 552-1142
odyssey1@vt.edu

**Office:** 238 Wallace Hall
Virginia Tech
Blacksburg, Virginia  24061
(540) 231-3736

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**EDUCATION**

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<thead>
<tr>
<th>Degree</th>
<th>Field</th>
<th>Year</th>
<th>Institution and Location</th>
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<td>Ph.D.</td>
<td>Child Development</td>
<td>1996-1999</td>
<td>Virginia Polytechnic Institute and State University (VPI&amp;SU) Blacksburg, Virginia</td>
</tr>
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*Comprehensive Areas:* Child Development, Interior Design

*Dissertation Topic:* Development of a Communication Tool to Aid in Preschool Interior Design

*Interdisciplinary dissertation bridging the fields of interior design and child development for a more comprehensive approach to children’s environments.*

<table>
<thead>
<tr>
<th>Special Program</th>
<th>Field</th>
<th>Year</th>
<th>Institution and Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Care Design Institute</td>
<td>Summer, 1998</td>
<td>Harvard and Tufts Universities Cambridge, Massachusetts</td>
<td></td>
</tr>
<tr>
<td>M.S.</td>
<td>Interior Design</td>
<td>1994-1996</td>
<td>VPI&amp;SU Blacksburg, Virginia</td>
</tr>
<tr>
<td>M.S.</td>
<td>Architecture/Construction Mgmt.</td>
<td>1993-1994</td>
<td>VPI&amp;SU Blacksburg, Virginia</td>
</tr>
<tr>
<td>B.S.</td>
<td>Interior Design</td>
<td>1974-1978</td>
<td>VPI&amp;SU Blacksburg, Virginia</td>
</tr>
</tbody>
</table>

**PROFESSIONAL EXPERIENCE**

**Academic / Teaching**

- **Virginia Polytechnic Institute**
  - Interior Design Graduate Teaching Assistant (1993-1995)
  - Human Resources GTA (1998 - present)
- **Radford University**
- **John Tyler Community College**
  - Interior Design Instructor and Program Coordinator (1984-1987)

**Industry**

- **Odyssey Design Group**
  - Principal and Co-Owner (1996 - present)
- **Bell Atlantic**
  - Architectural Staff Specialist (1979 - 1993)
- **SFC Design Center**
  - Designer (1985 - 1988)
- **Litton Office Products**
  - Design Consultant (1978 - 1979)